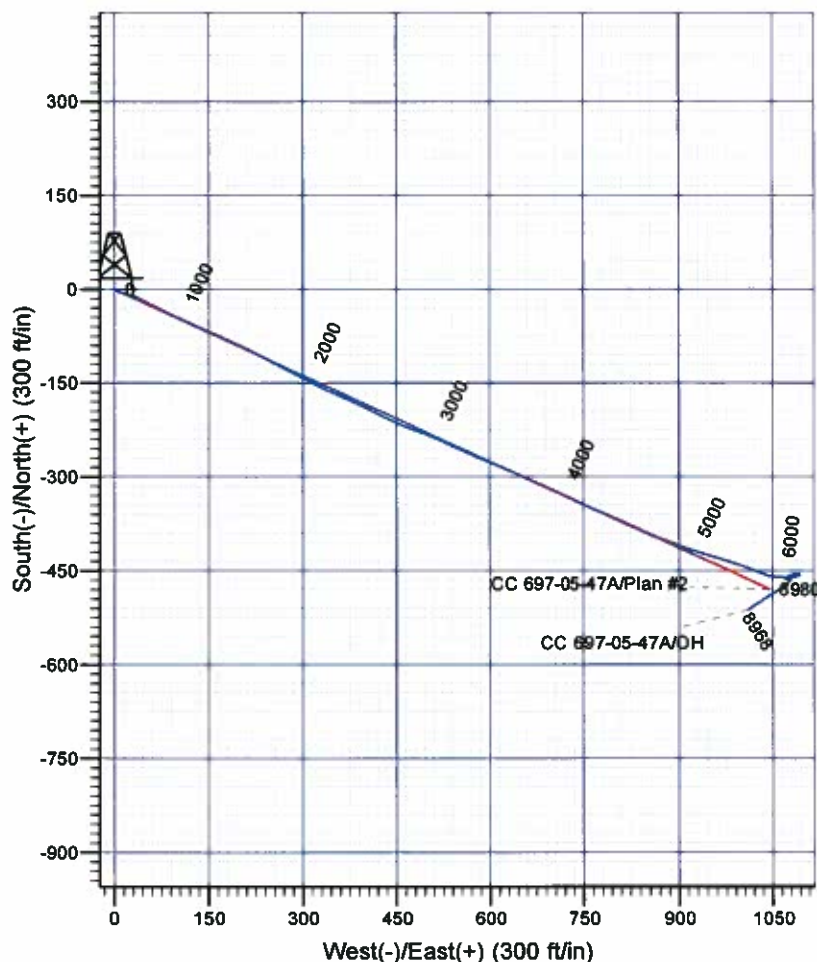
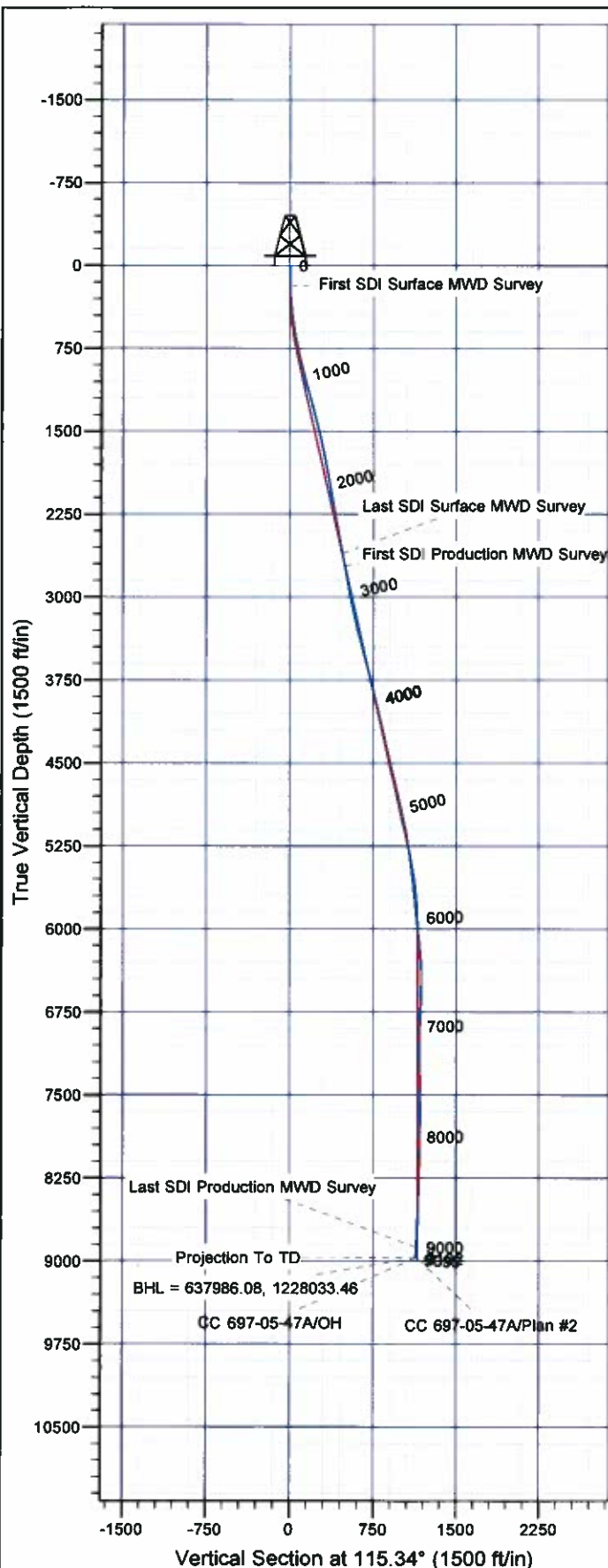




# Scientific Drilling

Company: OXY USA RMAT  
 Project: Garfield County, CO NAD27  
 Site: Cascade Creek 697-05C Pad  
 Well: CC 697-05-47A  
 Wellbore: OH  
 Design: OH



## Well Details: CC 697-05-47A

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	638528.70	1227038.98	39° 33' 16.415 N	108° 14' 30.030 W	N

## REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well CC 697-05-47A - Slot N, True North  
 Vertical (TVD) Reference: GL 8423' & RKB 30' @ 8453.00ft (H&P 353)  
 Section (VS) Reference: Slot - N(0.00N, 0.00E)  
 Measured Depth Reference: GL 8423' & RKB 30' @ 8453.00ft (H&P 353)  
 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

13:56, December 30 2011  
 Created By: Rex Hall

# **OXY USA RMAT**

**Garfield County, CO NAD27  
Cascade Creek 697-05C Pad  
CC 697-05-47A - Slot N**

**OH**

**Design: OH**

## **Standard Survey Report**

**30 December, 2011**

# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-47A - Slot N
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
<b>Site:</b>	Cascade Creek 697-05C Pad	<b>MD Reference:</b>	GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
<b>Well:</b>	CC 697-05-47A	<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 697-05C Pad, Sec. 5 T6S R97W			
Site Position:		Northing:		637,463.43 usft	
From:	Map	Easting:		1,226,150.07 usft	
Position Uncertainty:		0.00 ft		Slot Radius:	
				0.000 in	
				Grid Convergence:	
				-1.73 °	
				Latitude:	
				39° 33' 5.626 N	
				Longitude:	
				108° 14' 40.963 W	

Well	CC 697-05-47A - Slot N					
Well Position	+N/-S	0.00 ft	Northing:	638,528.70 usft	Latitude:	39° 33' 16.415 N
	+E/-W	0.00 ft	Easting:	1,227,038.98 usft	Longitude:	108° 14' 30.030 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	8,423.00 ft

<b>Wellbore</b>	OH
-----------------	----

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2005-10	2010/12/16	10.51	65.77	52,312

<b>Design</b>	OH
---------------	----

<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	115.34

Survey Program		Date	2011/12/30		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
183.00	2,653.00	Survey #1 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	
2,763.00	9,095.00	Survey #2 - Production MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	

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
183.00	0.99	127.16	182.99	-0.95	1.26	1.55	0.54	0.54	0.00
<b>First SDI Surface MWD Survey</b>									
243.00	1.69	127.87	242.97	-1.81	2.37	2.92	1.17	1.17	1.18
333.00	4.36	115.36	332.84	-4.09	6.51	7.64	3.04	2.97	-13.90
423.00	6.86	104.29	422.41	-6.88	14.81	16.33	3.01	2.78	-12.30
513.00	8.09	105.17	511.64	-9.87	26.13	27.84	1.37	1.37	0.98
603.00	9.85	116.94	600.54	-15.01	39.11	41.77	2.82	1.96	13.08
693.00	10.99	117.21	689.06	-22.42	53.60	58.04	1.27	1.27	0.30
783.00	11.87	114.83	777.27	-30.23	69.63	75.87	1.11	0.98	-2.64

# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-47A - Slot N
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
<b>Site:</b>	Cascade Creek 697-05C Pad	<b>MD Reference:</b>	GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
<b>Well:</b>	CC 697-05-47A	<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)
874.00	13.81	116.94	865.99	-39.09	87.81	96.09	2.19	2.13	2.32
964.00	14.60	115.45	953.24	-48.83	107.63	118.17	0.97	0.88	-1.66
1,059.00	15.30	113.34	1,045.02	-58.94	129.95	142.67	0.93	0.74	-2.22
1,153.00	15.92	112.55	1,135.56	-68.80	153.24	167.94	0.70	0.66	-0.84
1,248.00	15.04	116.94	1,227.11	-79.38	176.27	193.28	1.54	-0.93	4.62
1,342.00	13.81	112.90	1,318.15	-89.27	197.48	216.68	1.69	-1.31	-4.30
1,437.00	14.16	118.79	1,410.34	-99.28	218.11	239.61	1.54	0.37	6.20
1,531.00	12.84	116.50	1,501.74	-109.48	237.53	261.53	1.51	-1.40	-2.44
1,626.00	13.54	118.09	1,594.23	-119.42	256.79	283.19	0.83	0.74	1.67
1,720.00	10.82	116.94	1,686.11	-128.60	274.36	303.01	2.90	-2.89	-1.22
1,815.00	10.73	118.17	1,779.43	-136.82	290.11	320.75	0.26	-0.09	1.29
1,910.00	10.73	117.82	1,872.77	-145.12	305.73	338.42	0.07	0.00	-0.37
2,004.00	10.29	117.03	1,965.20	-153.02	320.95	355.56	0.49	-0.47	-0.84
2,099.00	10.46	114.13	2,058.64	-160.40	336.37	372.66	0.58	0.18	-3.05
2,193.00	9.67	113.25	2,151.20	-167.01	351.41	389.08	0.86	-0.84	-0.94
2,288.00	9.32	114.83	2,244.89	-173.39	365.73	404.75	0.46	-0.37	1.66
2,382.00	9.58	115.01	2,337.62	-179.89	379.72	420.18	0.28	0.28	0.19
2,477.00	10.64	114.22	2,431.14	-186.83	394.89	436.85	1.13	1.12	-0.83
2,571.00	11.08	115.54	2,523.46	-194.28	410.95	454.56	0.54	0.47	1.40
2,653.00	10.55	117.30	2,604.00	-201.12	424.73	469.94	0.76	-0.65	2.15
Last SDI Surface MWD Survey									
2,763.00	10.05	115.87	2,712.23	-209.93	442.32	489.60	0.51	-0.45	-1.30
First SDI Production MWD Survey									
2,857.00	10.73	114.04	2,804.69	-217.07	457.69	506.56	0.80	0.72	-1.95
2,952.00	10.55	109.82	2,898.06	-223.63	473.95	524.05	0.84	-0.19	-4.44
3,046.00	10.29	109.30	2,990.51	-229.32	489.96	540.97	0.29	-0.28	-0.55
3,141.00	10.82	112.37	3,083.90	-235.52	506.22	558.31	0.81	0.56	3.23
3,235.00	12.57	114.39	3,175.94	-243.10	523.70	577.35	1.91	1.86	2.15
3,330.00	15.21	116.15	3,268.16	-252.86	544.30	600.15	2.81	2.78	1.85
3,425.00	15.48	112.72	3,359.77	-263.25	567.18	625.28	1.00	0.28	-3.61
3,519.00	14.07	111.67	3,450.66	-272.31	589.37	649.21	1.53	-1.50	-1.12
3,614.00	14.86	112.72	3,542.65	-281.28	611.34	672.91	0.88	0.83	1.11
3,708.00	14.68	113.78	3,633.55	-290.74	633.36	696.85	0.35	-0.19	1.13
3,803.00	13.01	114.66	3,725.78	-300.06	654.09	719.58	1.77	-1.76	0.93
3,897.00	13.72	113.16	3,817.24	-308.86	673.96	741.30	0.84	0.76	-1.60
3,992.00	13.72	114.04	3,909.53	-317.88	694.61	763.82	0.22	0.00	0.93
4,086.00	13.98	115.54	4,000.79	-327.31	715.03	786.32	0.47	0.28	1.60
4,181.00	12.57	115.01	4,093.25	-336.63	734.75	808.13	1.49	-1.48	-0.56
4,275.00	13.10	116.86	4,184.90	-345.77	753.53	829.01	0.71	0.56	1.97
4,370.00	13.45	112.90	4,277.37	-354.93	773.31	850.81	1.03	0.37	-4.17
4,464.00	11.87	112.90	4,369.08	-362.95	792.29	871.39	1.68	-1.68	0.00
4,559.00	12.75	113.43	4,461.89	-370.92	810.91	891.63	0.93	0.93	0.56
4,653.00	14.42	115.36	4,553.26	-380.06	831.00	913.71	1.84	1.78	2.05



# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-47A - Slot N
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
<b>Site:</b>	Cascade Creek 697-05C Pad	<b>MD Reference:</b>	GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
<b>Well:</b>	CC 697-05-47A	<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)
4,748.00	12.31	116.68	4,645.68	-389.67	850.74	935.66	2.24	-2.22	1.39
4,843.00	13.54	112.37	4,738.28	-398.45	870.08	956.89	1.64	1.29	-4.54
4,937.00	13.81	110.79	4,829.61	-406.62	890.74	979.07	0.49	0.29	-1.68
5,032.00	12.49	109.74	4,922.12	-414.12	911.01	1,000.59	1.41	-1.39	-1.11
5,126.00	11.43	106.40	5,014.08	-420.18	929.51	1,019.91	1.35	-1.13	-3.55
5,221.00	10.74	107.54	5,107.31	-425.51	946.98	1,037.98	0.76	-0.73	1.20
5,315.00	9.85	107.45	5,199.79	-430.56	963.01	1,054.62	0.95	-0.95	-0.10
5,410.00	8.88	108.07	5,293.52	-435.27	977.73	1,069.95	1.03	-1.02	0.65
5,504.00	8.00	107.71	5,386.51	-439.51	990.86	1,083.63	0.94	-0.94	-0.38
5,599.00	7.21	107.80	5,480.67	-443.34	1,002.83	1,096.09	0.83	-0.83	0.09
5,693.00	6.24	110.79	5,574.02	-446.96	1,013.22	1,107.03	1.10	-1.03	3.18
5,788.00	5.72	113.43	5,668.50	-450.67	1,022.39	1,116.91	0.62	-0.55	2.78
5,882.00	5.89	107.63	5,762.02	-454.00	1,031.29	1,126.37	0.65	0.18	-6.17
5,977.00	4.84	112.20	5,856.61	-456.99	1,039.65	1,135.20	1.19	-1.11	4.81
6,071.00	6.07	97.26	5,950.18	-459.11	1,048.25	1,143.89	1.99	1.31	-15.89
6,166.00	6.95	95.50	6,044.57	-460.30	1,058.95	1,154.07	0.95	0.93	-1.85
6,260.00	6.86	93.65	6,137.89	-461.20	1,070.22	1,164.63	0.26	-0.10	-1.97
6,355.00	5.63	84.42	6,232.32	-461.11	1,080.52	1,173.90	1.67	-1.29	-9.72
6,449.00	3.87	72.12	6,326.00	-459.69	1,088.12	1,180.17	2.15	-1.87	-13.09
6,544.00	2.11	54.01	6,420.87	-457.68	1,092.59	1,183.35	2.08	-1.85	-19.06
6,638.00	0.88	341.59	6,514.84	-455.97	1,093.76	1,183.68	2.16	-1.31	-77.04
6,732.00	1.76	280.86	6,608.82	-455.02	1,092.12	1,181.78	1.63	0.94	-64.61
6,827.00	3.61	264.78	6,703.71	-455.01	1,087.71	1,177.79	2.08	1.95	-16.93
6,922.00	4.31	254.67	6,798.49	-456.23	1,081.28	1,172.51	1.04	0.74	-10.64
7,016.00	2.81	243.77	6,892.30	-458.18	1,075.81	1,168.40	1.74	-1.60	-11.60
7,111.00	2.29	231.90	6,987.21	-460.38	1,072.23	1,166.10	0.78	-0.55	-12.49
7,205.00	0.88	177.94	7,081.18	-462.26	1,070.78	1,165.60	2.03	-1.50	-57.40
7,300.00	1.49	80.38	7,176.16	-462.79	1,072.02	1,166.94	1.92	0.64	-102.69
7,394.00	1.49	75.63	7,270.13	-462.28	1,074.41	1,168.88	0.13	0.00	-5.05
7,489.00	0.97	89.52	7,365.11	-461.97	1,076.41	1,170.56	0.63	-0.55	14.62
7,583.00	1.06	138.30	7,459.09	-462.61	1,077.78	1,172.08	0.90	0.10	51.89
7,678.00	1.23	179.26	7,554.08	-464.28	1,078.38	1,173.33	0.86	0.18	43.12
7,772.00	2.11	212.39	7,648.04	-466.75	1,077.47	1,173.56	1.35	0.94	35.24
7,867.00	2.20	234.54	7,742.97	-469.29	1,075.05	1,172.46	0.88	0.09	23.32
7,961.00	1.93	237.09	7,836.91	-471.19	1,072.25	1,170.75	0.30	-0.29	2.71
8,056.00	1.41	225.93	7,931.87	-472.88	1,070.06	1,169.49	0.64	-0.55	-11.75
8,150.00	1.67	232.08	8,025.84	-474.52	1,068.15	1,168.47	0.33	0.28	6.54
8,245.00	2.46	229.18	8,120.77	-476.71	1,065.52	1,167.02	0.84	0.83	-3.05
8,339.00	3.52	236.30	8,214.65	-479.63	1,061.59	1,164.72	1.19	1.13	7.57
8,434.00	3.96	239.29	8,309.44	-482.92	1,056.34	1,161.39	0.51	0.46	3.15
8,528.00	4.40	240.96	8,403.19	-486.33	1,050.40	1,157.48	0.49	0.47	1.78
8,623.00	3.61	236.65	8,497.96	-489.74	1,044.72	1,153.80	0.89	-0.83	-4.54
8,717.00	3.96	237.62	8,591.76	-493.11	1,039.50	1,150.53	0.38	0.37	1.03
8,812.00	4.57	237.44	8,686.49	-496.90	1,033.54	1,146.77	0.64	0.64	-0.19

# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-47A - Slot N
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
<b>Site:</b>	Cascade Creek 697-05C Pad	<b>MD Reference:</b>	GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
<b>Well:</b>	CC 697-05-47A	<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)
8,906.00	5.54	236.21	8,780.13	-501.44	1,026.62	1,142.45	1.04	1.03	-1.31
9,001.00	6.07	235.95	8,874.64	-506.80	1,018.64	1,137.54	0.56	0.56	-0.27
<b>Last SDI Production MWD Survey</b>									
9,095.00	6.07	235.95	8,968.11	-512.37	1,010.41	1,132.48	0.00	0.00	0.00
<b>Projection To TD - BHL = 637986.08, 1228033.46</b>									

### Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
183.00	182.99	-0.95	1.26	First SDI Surface MWD Survey
2,653.00	2,604.00	-201.12	424.73	Last SDI Surface MWD Survey
2,763.00	2,712.23	-209.93	442.32	First SDI Production MWD Survey
9,001.00	8,874.64	-506.80	1,018.64	Last SDI Production MWD Survey
9,095.00	8,968.11	-512.37	1,010.41	Projection To TD
9,095.00	8,968.11	-512.37	1,010.41	BHL = 637986.08, 1228033.46

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