

OXY USA RMAT

Garfield County, CO NAD27

Cascade Creek 697-08-53 Pad

CC 697-08-33B - Slot H

OH

Design: OH

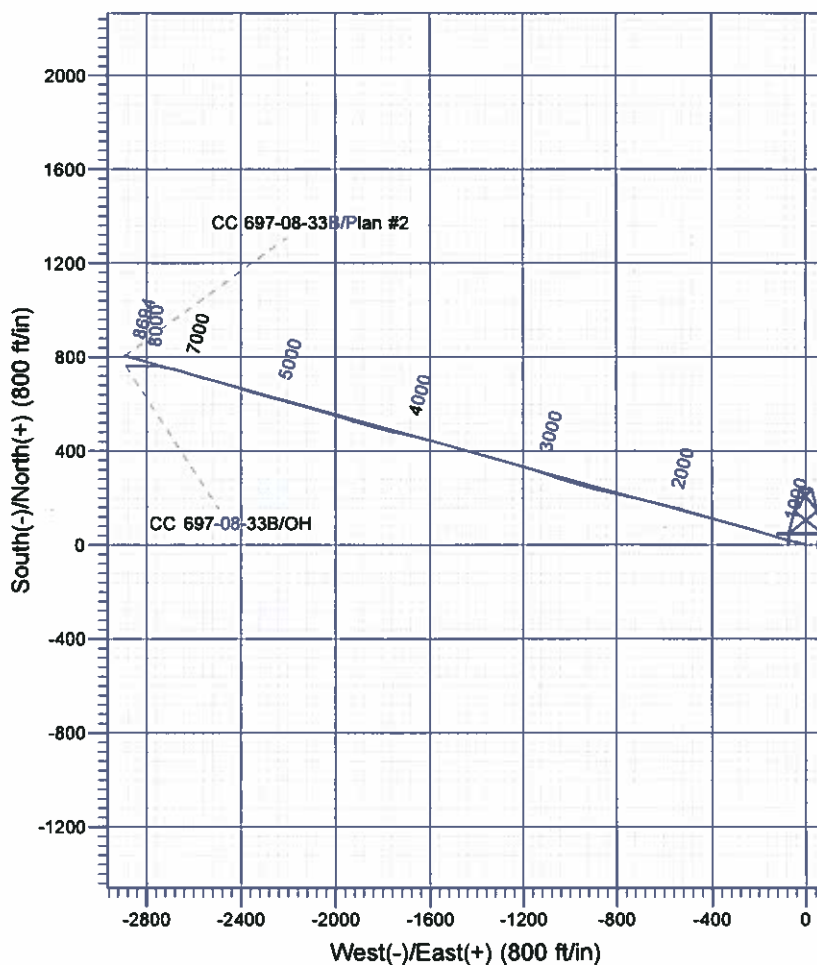
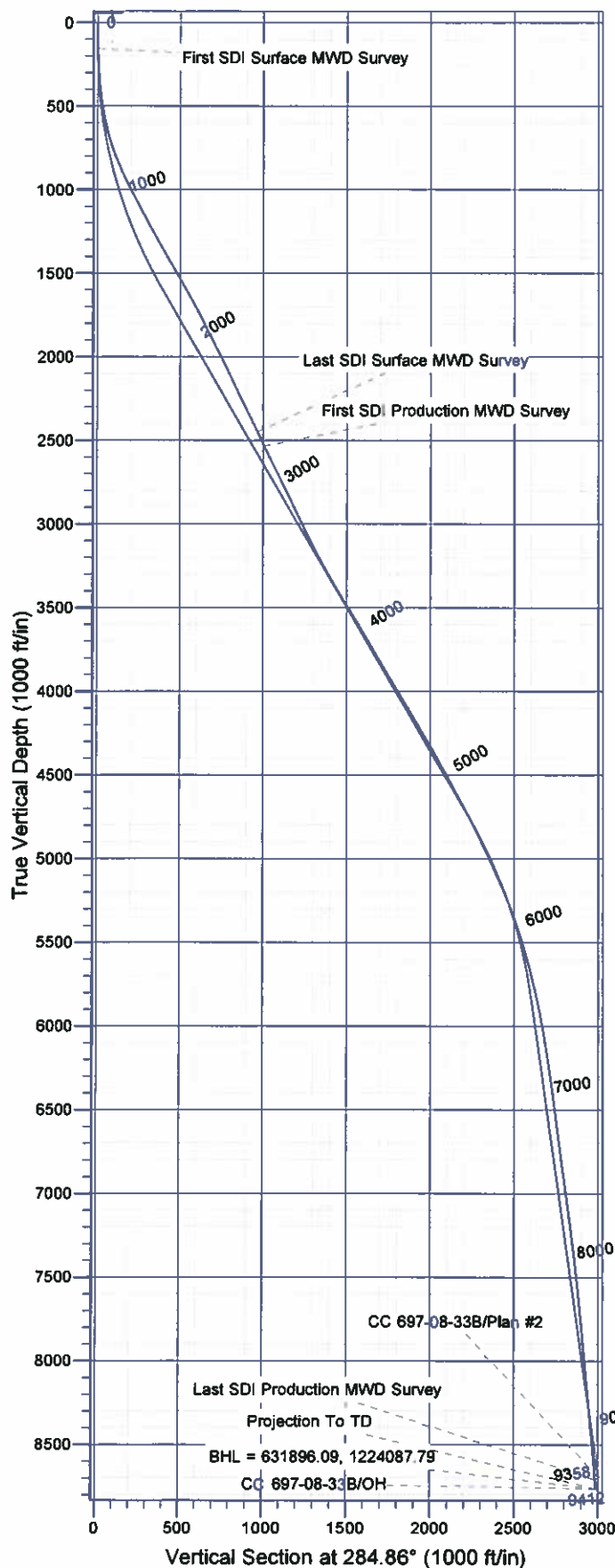
Standard Survey Report

01 December, 2011



Scientific Drilling

Company: OXY USA RMAT
 Project: Garfield County, CO NAD27
 Site: Cascade Creek 697-08-53 Pad
 Well: CC 697-08-33B
 Wellbore: OH
 Design: OH



Well Details: CC 697-08-33B

+N/-S	+E/-W	North	East	Latitude	Longitude	Slot
0.00	0.00	631047.78	1226951.56	39° 32' 2.484 N	108° 14' 28.264 W	H

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well CC 697-08-33B - Slot H, True North
 Vertical (TVD) Reference: GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
 Section (VS) Reference: Slot - H(0.00N, 0.00E)
 Measured Depth Reference: GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
 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

17:22, December 01 2011
 Created By: Rex Hall

Scientific Drilling International

Survey Report

Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well CC 697-08-33B - Slot H
Project:	Garfield County, CO NAD27	TVD Reference:	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
Site:	Cascade Creek 697-08-53 Pad	MD Reference:	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
Well:	CC 697-08-33B	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Rockies Compass Server

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

Site	Cascade Creek 697-08-53 Pad, Sec. 8 T6S R97W				
Site Position:		Northing:	630,837.78 usft	Latitude:	39° 32' 0.393 N
From:	Map	Easting:	1,226,897.42 usft	Longitude:	108° 14' 28.874 W
Position Uncertainty:	0.00 ft	Slot Radius:	0.000 in	Grid Convergence:	-1.73 °

Well	CC 697-08-33B - Slot H					
Well Position	+N/-S	0.00 ft	Northing:	631,047.78 usft	Latitude:	39° 32' 2.484 N
	+E/-W	0.00 ft	Easting:	1,226,951.56 usft	Longitude:	108° 14' 28.264 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	8,409.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2005-10	2010/09/01	10.54	65.76	52,329

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	284.86	

Survey Program	Date	2011/12/01			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
154.00	2,670.00	Survey #1 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	
2,766.00	9,412.00	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	
154.00	1.21	277.08	153.99	0.20	-1.61	1.61	0.79	0.79	0.00	
First SDI Surface MWD Survey										
243.00	2.20	298.11	242.95	1.12	-4.05	4.21	1.30	1.11	23.63	
333.00	4.92	292.74	332.77	3.43	-9.14	9.71	3.04	3.02	-5.97	
422.00	6.60	287.03	421.32	6.40	-17.55	18.60	1.99	1.89	-6.42	
511.00	9.58	280.62	509.42	9.26	-29.72	31.10	3.49	3.35	-7.20	
602.00	12.75	281.41	598.69	12.65	-47.01	48.68	3.49	3.48	0.87	
694.00	16.36	283.78	687.72	17.74	-69.55	71.78	3.98	3.92	2.58	
786.00	20.05	285.01	775.10	24.92	-97.38	100.51	4.03	4.01	1.34	

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Survey Report

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Project:	Garfield County, CO NAD27	TVD Reference:	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
Site:	Cascade Creek 697-08-53 Pad	MD Reference:	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
Well:	CC 697-08-33B	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	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	23.74	287.30	856.74	34.09	-128.87	133.31	4.30	4.19	2.60
966.00	26.03	287.65	940.19	45.72	-165.80	171.98	2.49	2.49	0.38
1,060.00	27.70	286.15	1,024.05	58.06	-206.44	214.43	1.92	1.78	-1.60
1,155.00	27.87	286.33	1,108.09	70.44	-248.96	258.70	0.20	0.18	0.19
1,250.00	28.05	284.92	1,192.01	82.43	-291.85	303.23	0.72	0.19	-1.48
1,344.00	29.99	284.75	1,274.20	94.11	-335.93	348.83	2.07	2.06	-0.18
1,439.00	29.90	287.30	1,356.52	107.19	-381.50	396.23	1.34	-0.09	2.68
1,534.00	30.25	286.42	1,438.73	121.00	-427.06	443.81	0.59	0.37	-0.93
1,628.00	30.43	286.06	1,519.86	134.28	-472.65	491.28	0.27	0.19	-0.38
1,723.00	30.25	285.98	1,601.85	147.52	-518.77	539.26	0.19	-0.19	-0.08
1,818.00	27.96	285.54	1,684.85	160.08	-563.24	585.46	2.42	-2.41	-0.46
1,913.00	27.00	284.92	1,769.13	171.60	-605.53	629.29	1.05	-1.01	-0.65
2,007.00	27.26	283.43	1,852.78	182.09	-647.09	672.15	0.77	0.28	-1.59
2,102.00	26.64	283.69	1,937.47	192.18	-688.95	715.19	0.66	-0.65	0.27
2,196.00	27.52	281.58	2,021.16	201.53	-730.70	757.94	1.39	0.94	-2.24
2,291.00	25.06	281.23	2,106.33	209.86	-771.94	799.94	2.59	-2.59	-0.37
2,386.00	26.03	281.93	2,192.04	218.08	-812.07	840.84	1.07	1.02	0.74
2,480.00	25.85	282.64	2,276.57	226.83	-852.25	881.92	0.38	-0.19	0.76
2,575.00	26.03	284.57	2,362.00	236.61	-892.63	923.46	0.91	0.19	2.03
2,670.00	26.47	285.98	2,447.21	247.68	-933.16	965.47	0.80	0.46	1.48
Last SDI Surface MWD Survey									
2,766.00	25.06	287.37	2,533.66	259.64	-973.13	1,007.17	1.60	-1.47	1.45
First SDI Production MWD Survey									
2,860.00	25.94	287.46	2,618.50	271.75	-1,011.75	1,047.60	0.94	0.94	0.10
2,955.00	26.91	287.11	2,703.58	284.31	-1,052.11	1,089.84	1.03	1.02	-0.37
3,050.00	26.47	288.96	2,788.46	297.52	-1,092.69	1,132.44	0.99	-0.46	1.95
3,145.00	25.15	288.60	2,873.98	310.84	-1,131.84	1,173.71	1.40	-1.39	-0.38
3,239.00	25.24	286.58	2,959.04	322.93	-1,169.98	1,213.67	0.92	0.10	-2.15
3,334.00	25.59	286.14	3,044.84	334.41	-1,209.10	1,254.43	0.42	0.37	-0.46
3,429.00	27.26	285.44	3,129.91	345.91	-1,249.79	1,296.70	1.79	1.76	-0.74
3,524.00	28.31	286.14	3,213.96	357.96	-1,292.40	1,340.98	1.16	1.11	0.74
3,618.00	29.55	285.79	3,296.23	370.46	-1,336.11	1,386.44	1.33	1.32	-0.37
3,713.00	30.43	285.70	3,378.51	383.35	-1,381.82	1,433.92	0.93	0.93	-0.09
3,807.00	31.39	285.35	3,459.16	396.27	-1,428.34	1,482.20	1.04	1.02	-0.37
3,902.00	31.57	286.49	3,540.18	409.88	-1,476.05	1,531.80	0.65	0.19	1.20
3,996.00	30.51	285.70	3,620.71	423.32	-1,522.61	1,580.26	1.21	-1.13	-0.84
4,091.00	31.04	285.09	3,702.34	436.22	-1,569.48	1,628.86	0.65	0.56	-0.64
4,186.00	29.81	283.59	3,784.25	448.15	-1,616.08	1,676.96	1.52	-1.29	-1.58
4,281.00	30.43	283.77	3,866.43	459.42	-1,662.40	1,724.63	0.66	0.65	0.19
4,375.00	30.34	282.80	3,947.52	470.35	-1,708.67	1,772.15	0.53	-0.10	-1.03
4,470.00	31.04	282.10	4,029.21	480.80	-1,756.02	1,820.60	0.83	0.74	-0.74
4,565.00	31.13	284.03	4,110.57	491.89	-1,803.79	1,869.62	1.05	0.09	2.03
4,660.00	31.22	285.00	4,191.85	504.21	-1,851.40	1,918.79	0.54	0.09	1.02

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Survey Report

Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well CC 697-08-33B - Slot H
Project:	Garfield County, CO NAD27	TVD Reference:	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
Site:	Cascade Creek 697-08-53 Pad	MD Reference:	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
Well:	CC 697-08-33B	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	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)
4,755.00	30.78	286.58	4,273.28	517.52	-1,898.48	1,967.71	0.97	-0.46	1.66
4,849.00	29.37	287.72	4,354.63	531.40	-1,943.49	2,014.77	1.62	-1.50	1.21
4,944.00	29.02	287.64	4,437.56	545.48	-1,987.64	2,061.06	0.37	-0.37	-0.08
5,039.00	28.75	287.64	4,520.74	559.38	-2,031.37	2,106.89	0.28	-0.28	0.00
5,133.00	27.96	286.23	4,603.46	572.39	-2,074.08	2,151.51	1.10	-0.84	-1.50
5,228.00	28.23	285.79	4,687.27	584.73	-2,117.08	2,196.24	0.36	0.28	-0.46
5,323.00	27.61	285.44	4,771.21	596.70	-2,159.92	2,240.71	0.68	-0.65	-0.37
5,417.00	26.12	285.70	4,855.06	608.10	-2,200.84	2,283.19	1.59	-1.59	0.28
5,512.00	25.06	284.91	4,940.74	618.94	-2,240.41	2,324.22	1.17	-1.12	-0.83
5,607.00	24.45	284.56	5,027.01	629.06	-2,278.88	2,364.00	0.66	-0.64	-0.37
5,701.00	23.13	285.53	5,113.02	638.89	-2,315.50	2,401.91	1.46	-1.40	1.03
5,796.00	23.13	286.14	5,200.39	649.08	-2,351.40	2,439.23	0.25	0.00	0.64
5,891.00	21.90	287.72	5,288.15	659.66	-2,386.21	2,475.58	1.44	-1.29	1.66
5,986.00	18.99	286.85	5,377.15	669.53	-2,417.88	2,508.73	3.08	-3.06	-0.92
6,080.00	17.32	286.76	5,466.47	678.00	-2,445.92	2,538.00	1.78	-1.78	-0.10
6,175.00	15.56	286.41	5,557.58	685.68	-2,471.68	2,564.87	1.86	-1.85	-0.37
6,270.00	14.95	286.23	5,649.23	692.70	-2,495.67	2,589.86	0.64	-0.64	-0.19
6,364.00	13.54	286.05	5,740.34	699.13	-2,517.89	2,612.98	1.50	-1.50	-0.19
6,459.00	12.22	282.89	5,832.95	704.45	-2,538.38	2,634.15	1.57	-1.39	-3.33
6,554.00	11.17	284.74	5,925.98	709.04	-2,557.08	2,653.40	1.17	-1.11	1.95
6,648.00	10.29	284.91	6,018.33	713.51	-2,574.00	2,670.90	0.94	-0.94	0.18
6,743.00	9.06	286.58	6,111.98	717.83	-2,589.37	2,686.86	1.33	-1.29	1.76
6,838.00	8.44	289.04	6,205.87	722.24	-2,603.13	2,701.29	0.76	-0.65	2.59
6,932.00	7.91	289.48	6,298.92	726.65	-2,615.75	2,714.62	0.57	-0.56	0.47
7,027.00	7.65	291.24	6,393.04	731.12	-2,627.80	2,727.42	0.37	-0.27	1.85
7,122.00	7.65	288.43	6,487.20	735.41	-2,639.69	2,740.01	0.39	0.00	-2.96
7,217.00	7.65	286.93	6,581.35	739.25	-2,651.74	2,752.64	0.21	0.00	-1.58
7,311.00	7.30	288.08	6,674.56	742.92	-2,663.41	2,764.86	0.40	-0.37	1.22
7,406.00	7.30	281.31	6,768.79	745.98	-2,675.06	2,776.91	0.90	0.00	-7.13
7,501.00	7.74	276.91	6,862.97	747.93	-2,687.33	2,789.27	0.76	0.46	-4.63
7,595.00	8.18	280.69	6,956.07	749.93	-2,700.19	2,802.21	0.73	0.47	4.02
7,690.00	7.65	282.80	7,050.16	752.59	-2,712.99	2,815.27	0.64	-0.56	2.22
7,785.00	7.56	281.84	7,144.32	755.27	-2,725.28	2,827.83	0.16	-0.09	-1.01
7,879.00	7.39	281.22	7,237.53	757.72	-2,737.26	2,840.04	0.20	-0.18	-0.66
7,974.00	7.39	275.95	7,331.74	759.54	-2,749.33	2,852.17	0.71	0.00	-5.55
8,069.00	6.16	274.28	7,426.07	760.55	-2,760.49	2,863.22	1.31	-1.29	-1.76
8,164.00	5.98	270.23	7,520.54	760.95	-2,770.52	2,873.01	0.49	-0.19	-4.26
8,258.00	6.42	268.39	7,613.99	760.83	-2,780.67	2,882.79	0.51	0.47	-1.96
8,353.00	5.80	269.71	7,708.45	760.65	-2,790.78	2,892.52	0.67	-0.65	1.39
8,448.00	5.98	266.54	7,802.95	760.33	-2,800.52	2,901.85	0.39	0.19	-3.34
8,542.00	5.63	263.99	7,896.47	759.55	-2,809.99	2,910.81	0.46	-0.37	-2.71
8,637.00	5.01	272.34	7,991.06	759.23	-2,818.77	2,919.21	1.04	-0.65	8.79
8,731.00	4.92	274.54	8,084.71	759.72	-2,826.89	2,927.18	0.22	-0.10	2.34
8,826.00	5.36	279.99	8,179.32	760.81	-2,835.32	2,935.61	0.69	0.46	5.74

Scientific Drilling International

Survey Report

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Site:	Cascade Creek 697-08-53 Pad	MD Reference:	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
Well:	CC 697-08-33B	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	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)
8,921.00	5.98	276.47	8,273.86	762.14	-2,844.61	2,944.93	0.75	0.65	-3.71
9,015.00	5.72	270.06	8,367.37	762.70	-2,854.16	2,954.30	0.75	-0.28	-6.82
9,110.00	5.10	264.17	8,461.95	762.27	-2,863.09	2,962.83	0.88	-0.65	-6.20
9,205.00	5.28	265.58	8,556.56	761.51	-2,871.65	2,970.90	0.23	0.19	1.48
9,299.00	4.48	269.53	8,650.22	761.14	-2,879.63	2,978.53	0.92	-0.85	4.20
9,356.00	4.22	273.75	8,707.05	761.26	-2,883.95	2,982.73	0.72	-0.46	7.40
Last SDI Production MWD Survey									
9,412.00	4.22	273.75	8,762.90	761.53	-2,888.07	2,986.78	0.00	0.00	0.00
Projection To TD - BHL = 631896.09, 1224087.79									

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
154.00	153.99	0.20	-1.61	First SDI Surface MWD Survey
2,670.00	2,447.21	247.68	-933.16	Last SDI Surface MWD Survey
2,766.00	2,533.66	259.64	-973.13	First SDI Production MWD Survey
9,356.00	8,707.05	761.26	-2,883.95	Last SDI Production MWD Survey
9,412.00	8,762.90	761.53	-2,888.07	Projection To TD
9,412.00	8,762.90	761.53	-2,888.07	BHL = 631896.09, 1224087.79

Checked By: _____	Approved By: _____	Date: _____
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