

OXY USA RMAT

Garfield County, CO NAD27

Cascade Creek 697-08-53 Pad

CC 697-08-49 - Slot N

OH

Design: OH

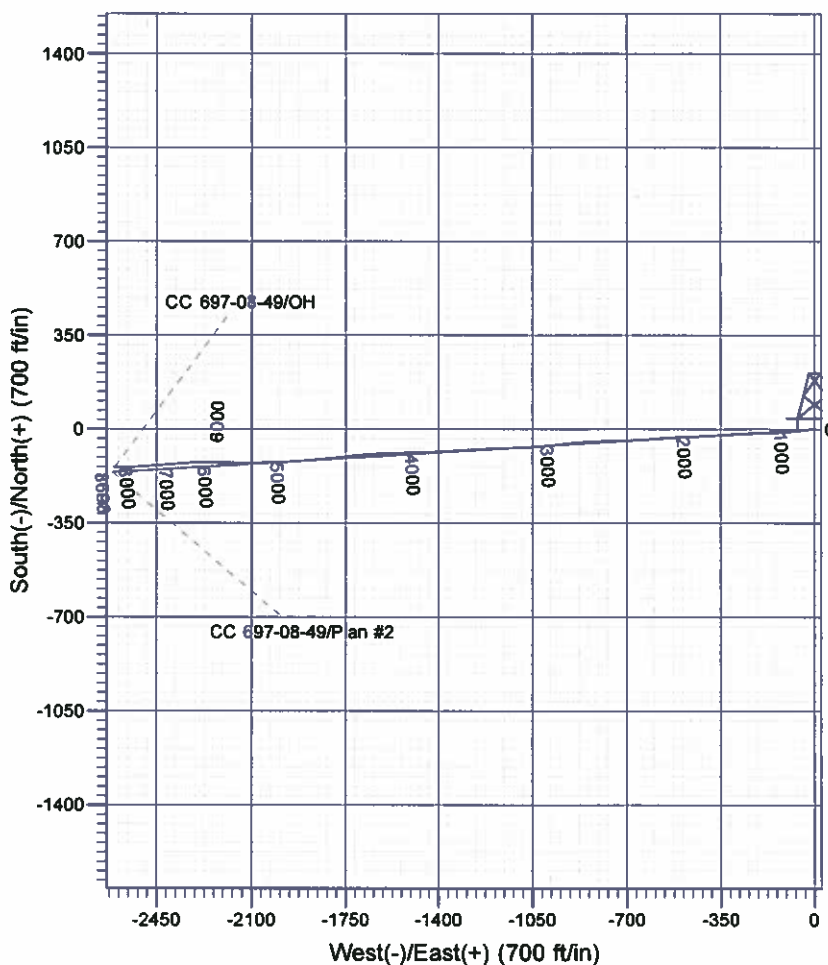
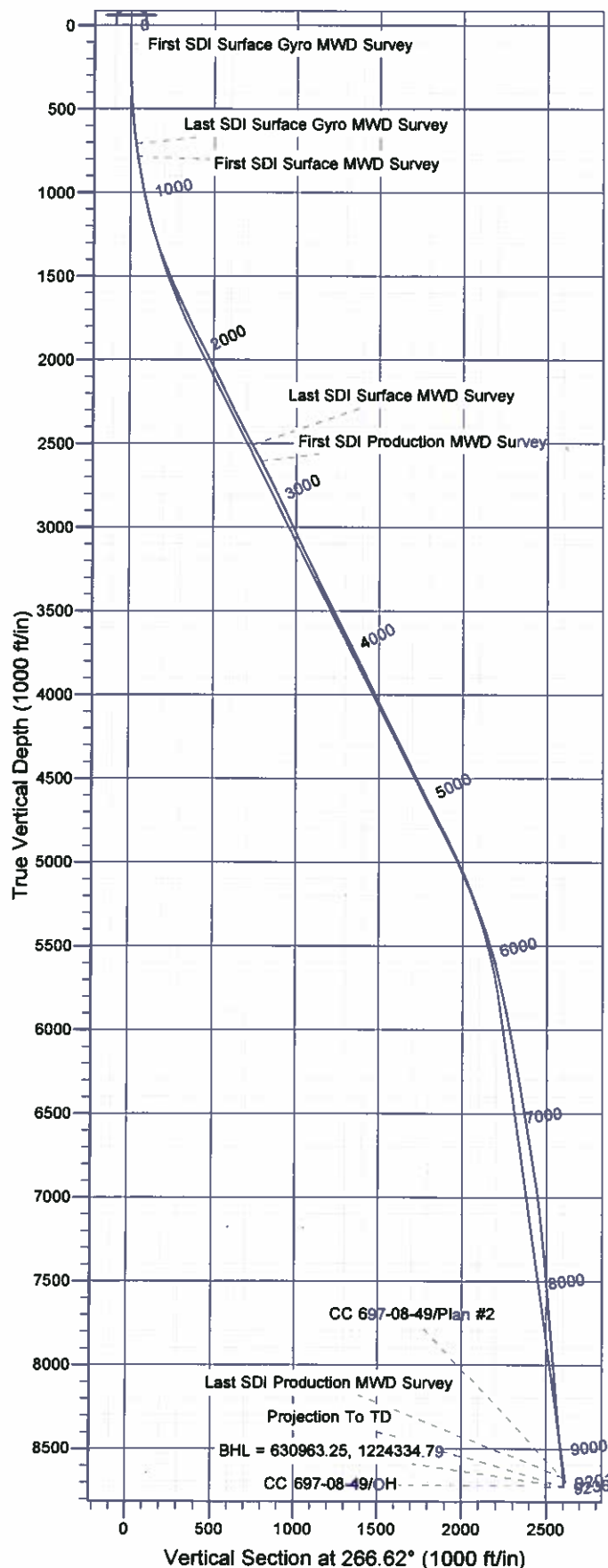
Standard Survey Report

30 November, 2011



Scientific Drilling

Company: OXY USA RMAT
 Project: Garfield County, CO NAD27
 Site: Cascade Creek 697-08-53 Pad
 Well: CC 697-08-49
 Wellbore: OH
 Design: OH



Well Details: CC 697-08-49

TVD Reference: GL 8379' & RKB 30' @ 8409.00ft (H&P 330) Level: 8379.00
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.00 0.00 631026.77 1226943.51 39° 32' 2.274 N 108° 14' 28.359 W N

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well CC 697-08-49 - Slot N, True North
 Vertical (TVD) Reference: GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
 Section (VS) Reference: Slot - N(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

18:12, November 30 2011
 Created By: Rex Hall

Scientific Drilling International

Survey Report

Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well CC 697-08-49 - Slot N
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 697-08-49	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 697-08-49 - Slot N					
Well Position	+N/-S	0.00 ft	Northing:	631,026.77 usft	Latitude:	39° 32' 2.274 N
	+E/-W	0.00 ft	Easting:	1,226,943.51 usft	Longitude:	108° 14' 28.359 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	8,379.00 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		266.62

Survey Program	Date	2011/11/30		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
110.00	711.00	Survey #1 - Surface Gyro MWD (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4
786.00	2,656.00	Survey #2 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA
2,766.00	9,236.00	Survey #3 - 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
110.00	0.09	264.64	110.00	-0.01	-0.09	0.09	0.08	0.08	0.00
First SDI Surface Gyro MWD Survey									
171.00	0.18	305.77	171.00	0.04	-0.21	0.21	0.21	0.15	67.43
260.00	0.26	310.25	260.00	0.26	-0.48	0.46	0.09	0.09	5.03
348.00	2.11	272.29	348.98	0.45	-2.27	2.24	2.15	2.08	-42.65
439.00	3.08	272.20	438.88	0.61	-6.34	6.30	1.08	1.08	-0.10
528.00	4.13	268.95	527.71	0.64	-11.94	11.88	1.20	1.18	-3.65
619.00	6.77	263.14	618.29	-0.06	-20.54	20.51	2.96	2.90	-6.38

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Survey Report

Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well CC 697-08-49 - Slot N
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 697-08-49	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)
711.00	8.27	262.79	709.49	-1.54	-32.49	32.52	1.63	1.63	-0.38
Last SDI Surface Gyro MWD Survey									
786.00	9.23	260.57	783.62	-3.20	-43.77	43.89	1.36	1.28	-2.96
First SDI Surface MWD Survey									
875.00	10.29	260.13	871.33	-5.73	-58.65	58.88	1.19	1.19	-0.49
965.00	10.99	262.94	959.78	-8.16	-75.08	75.43	0.97	0.78	3.12
1,059.00	12.49	264.96	1,051.81	-10.16	-94.10	94.53	1.65	1.60	2.15
1,154.00	14.51	267.60	1,144.19	-11.56	-116.22	116.70	2.22	2.13	2.78
1,248.00	17.23	267.77	1,234.59	-12.59	-141.91	142.40	2.89	2.89	0.18
1,343.00	19.17	268.13	1,324.84	-13.65	-171.56	172.06	2.05	2.04	0.38
1,438.00	20.84	267.33	1,414.10	-14.95	-204.03	204.56	1.78	1.76	-0.84
1,533.00	22.86	268.21	1,502.27	-16.31	-239.36	239.90	2.15	2.13	0.93
1,627.00	24.18	267.95	1,588.46	-17.57	-276.85	277.40	1.41	1.40	-0.28
1,722.00	24.36	266.28	1,675.07	-19.54	-315.84	316.45	0.75	0.19	-1.76
1,817.00	25.32	265.31	1,761.28	-22.47	-355.64	356.35	1.10	1.01	-1.02
1,911.00	26.47	266.81	1,845.84	-25.28	-396.59	397.39	1.41	1.22	1.60
2,006.00	28.31	268.13	1,930.19	-27.19	-440.25	441.09	2.04	1.94	1.39
2,101.00	26.64	268.21	2,014.47	-28.59	-484.06	484.90	1.76	-1.76	0.08
2,195.00	27.61	267.42	2,098.13	-30.23	-526.88	527.75	1.10	1.03	-0.84
2,290.00	24.45	265.14	2,183.48	-32.89	-568.47	569.42	3.49	-3.33	-2.40
2,385.00	25.41	263.64	2,269.63	-36.81	-608.32	609.43	1.21	1.01	-1.58
2,479.00	26.82	265.84	2,354.04	-40.58	-649.52	650.78	1.82	1.50	2.34
2,574.00	28.75	268.48	2,438.08	-42.74	-693.74	695.05	2.41	2.03	2.78
2,656.00	30.07	269.80	2,509.51	-43.34	-734.00	735.28	1.79	1.61	1.61
Last SDI Surface MWD Survey									
2,766.00	28.23	269.08	2,605.58	-43.85	-787.57	788.79	1.70	-1.67	-0.65
First SDI Production MWD Survey									
2,861.00	27.52	266.80	2,689.56	-45.44	-831.95	833.18	1.35	-0.75	-2.40
2,956.00	25.94	264.95	2,774.40	-48.49	-874.57	875.90	1.88	-1.66	-1.95
3,051.00	25.06	263.46	2,860.15	-52.61	-915.25	916.76	1.15	-0.93	-1.57
3,145.00	26.12	263.28	2,944.93	-57.30	-955.58	957.30	1.13	1.13	-0.19
3,240.00	24.45	262.67	3,030.82	-62.26	-995.85	997.79	1.78	-1.76	-0.64
3,335.00	26.47	265.48	3,116.60	-66.44	-1,036.47	1,038.58	2.48	2.13	2.96
3,430.00	26.20	268.82	3,201.74	-68.54	-1,078.54	1,080.71	1.59	-0.28	3.52
3,524.00	26.12	268.38	3,286.11	-69.55	-1,119.97	1,122.12	0.22	-0.09	-0.47
3,619.00	26.12	267.59	3,371.41	-71.02	-1,161.77	1,163.93	0.37	0.00	-0.83
3,713.00	26.82	267.41	3,455.56	-72.85	-1,203.63	1,205.83	0.75	0.74	-0.19
3,808.00	27.44	266.71	3,540.10	-75.07	-1,246.89	1,249.15	0.73	0.65	-0.74
3,903.00	26.82	267.76	3,624.65	-77.17	-1,290.16	1,292.46	0.82	-0.65	1.11
3,997.00	26.73	266.18	3,708.57	-79.40	-1,332.44	1,334.80	0.76	-0.10	-1.68
4,092.00	26.29	266.36	3,793.58	-82.16	-1,374.75	1,377.21	0.47	-0.46	0.19
4,187.00	26.20	267.15	3,878.79	-84.54	-1,416.70	1,419.22	0.38	-0.09	0.83
4,281.00	25.76	267.94	3,963.29	-86.31	-1,457.84	1,460.39	0.60	-0.47	0.84
4,376.00	26.29	268.55	4,048.66	-87.58	-1,499.50	1,502.05	0.62	0.56	0.64

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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 697-08-49	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)
4,471.00	26.64	268.99	4,133.70	-88.49	-1,541.82	1,544.36	0.42	0.37	0.46
4,566.00	26.12	268.64	4,218.81	-89.36	-1,584.03	1,586.54	0.57	-0.55	-0.37
4,661.00	26.03	266.45	4,304.14	-91.15	-1,625.74	1,628.28	1.02	-0.09	-2.31
4,755.00	26.64	265.65	4,388.39	-94.02	-1,667.34	1,669.98	0.75	0.65	-0.85
4,850.00	27.87	263.98	4,472.84	-97.97	-1,710.66	1,713.46	1.52	1.29	-1.76
4,945.00	26.82	263.72	4,557.22	-102.64	-1,754.05	1,757.05	1.11	-1.11	-0.27
5,040.00	26.47	264.16	4,642.14	-107.14	-1,796.41	1,799.60	0.42	-0.37	0.46
5,134.00	26.29	264.69	4,726.35	-111.20	-1,837.98	1,841.34	0.32	-0.19	0.56
5,229.00	27.08	265.21	4,811.23	-114.95	-1,880.48	1,883.98	0.87	0.83	0.55
5,323.00	26.12	264.69	4,895.28	-118.65	-1,922.40	1,926.05	1.05	-1.02	-0.55
5,418.00	24.89	266.71	4,981.02	-121.74	-1,963.18	1,966.95	1.59	-1.29	2.13
5,513.00	23.30	268.12	5,067.74	-123.50	-2,001.92	2,005.72	1.78	-1.67	1.48
5,608.00	22.16	268.73	5,155.36	-124.51	-2,038.62	2,042.41	1.23	-1.20	0.64
5,702.00	20.66	269.70	5,242.87	-124.99	-2,072.92	2,076.69	1.64	-1.60	1.03
5,797.00	19.26	270.49	5,332.16	-124.95	-2,105.35	2,109.06	1.50	-1.47	0.83
5,892.00	18.20	270.22	5,422.13	-124.76	-2,135.86	2,139.50	1.12	-1.12	-0.28
5,987.00	16.00	269.35	5,512.93	-124.85	-2,163.79	2,167.38	2.33	-2.32	-0.92
6,081.00	14.42	268.47	5,603.63	-125.31	-2,188.44	2,192.02	1.70	-1.68	-0.94
6,176.00	13.19	269.96	5,695.88	-125.63	-2,211.11	2,214.67	1.35	-1.29	1.57
6,271.00	11.96	272.25	5,788.60	-125.25	-2,231.78	2,235.29	1.40	-1.29	2.41
6,365.00	11.52	272.86	5,880.64	-124.40	-2,250.89	2,254.31	0.49	-0.47	0.65
6,460.00	11.61	272.86	5,973.71	-123.45	-2,269.91	2,273.24	0.09	0.09	0.00
6,555.00	11.17	269.17	6,066.84	-123.11	-2,288.66	2,291.94	0.90	-0.46	-3.88
6,649.00	10.73	267.15	6,159.13	-123.67	-2,306.50	2,309.78	0.62	-0.47	-2.15
6,744.00	9.85	265.92	6,252.60	-124.69	-2,323.44	2,326.75	0.95	-0.93	-1.29
6,839.00	9.67	263.98	6,346.22	-126.11	-2,339.48	2,342.85	0.39	-0.19	-2.04
6,933.00	9.23	266.18	6,438.95	-127.44	-2,354.86	2,358.27	0.61	-0.47	2.34
7,028.00	9.32	266.80	6,532.71	-128.37	-2,370.14	2,373.58	0.14	0.09	0.65
7,123.00	8.88	265.74	6,626.51	-129.35	-2,385.13	2,388.61	0.50	-0.46	-1.12
7,217.00	9.06	266.62	6,719.36	-130.32	-2,399.75	2,403.26	0.24	0.19	0.94
7,312.00	9.76	265.13	6,813.08	-131.45	-2,415.24	2,418.79	0.78	0.74	-1.57
7,407.00	8.71	263.11	6,906.85	-132.99	-2,430.41	2,434.02	1.16	-1.11	-2.13
7,502.00	7.65	264.34	7,000.88	-134.48	-2,443.84	2,447.52	1.13	-1.12	1.29
7,596.00	6.60	265.83	7,094.16	-135.49	-2,455.46	2,459.17	1.13	-1.12	1.59
7,691.00	5.80	266.18	7,188.60	-136.21	-2,465.69	2,469.43	0.84	-0.84	0.37
7,786.00	4.92	265.04	7,283.18	-136.88	-2,474.54	2,478.31	0.93	-0.93	-1.20
7,880.00	5.36	265.13	7,376.80	-137.60	-2,482.93	2,486.72	0.47	0.47	0.10
7,975.00	5.98	266.53	7,471.34	-138.28	-2,492.29	2,496.11	0.67	0.65	1.47
8,070.00	5.45	270.93	7,565.87	-138.50	-2,501.74	2,505.56	0.72	-0.56	4.63
8,165.00	4.48	267.85	7,660.51	-138.57	-2,509.96	2,513.76	1.06	-1.02	-3.24
8,259.00	5.01	264.95	7,754.19	-139.07	-2,517.72	2,521.54	0.62	0.56	-3.09
8,354.00	5.01	259.15	7,848.82	-140.21	-2,525.92	2,529.80	0.53	0.00	-6.11
8,449.00	4.40	261.26	7,943.50	-141.55	-2,533.60	2,537.54	0.67	-0.64	2.22

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Site:	Cascade Creek 697-08-53 Pad	MD Reference:	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
Well:	CC 697-08-49	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)
8,543.00	3.96	266.09	8,037.25	-142.32	-2,540.40	2,544.37	0.60	-0.47	5.14
8,638.00	4.75	265.30	8,131.98	-142.86	-2,547.60	2,551.59	0.83	0.83	-0.83
8,732.00	5.10	268.64	8,225.63	-143.28	-2,555.85	2,559.65	0.48	0.37	3.55
8,827.00	5.19	271.10	8,320.25	-143.30	-2,564.17	2,568.16	0.25	0.09	2.59
8,922.00	5.54	274.62	8,414.83	-142.85	-2,573.04	2,576.98	0.51	0.37	3.71
9,016.00	6.42	274.62	8,508.32	-142.06	-2,582.80	2,586.68	0.94	0.94	0.00
9,111.00	6.07	269.70	8,602.76	-141.66	-2,593.11	2,596.95	0.67	-0.37	-5.18
9,180.00	5.63	266.62	8,671.40	-141.88	-2,600.14	2,603.98	0.78	-0.64	-4.46
Last SDI Production MWD Survey									
9,236.00	5.63	266.62	8,727.13	-142.20	-2,605.62	2,609.48	0.00	0.00	0.00
Projection To TD - BHL = 630963.25, 1224334.79									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
110.00	110.00	-0.01	-0.09	First SDI Surface Gyro MWD Survey
711.00	709.49	-1.54	-32.49	Last SDI Surface Gyro MWD Survey
786.00	783.62	-3.20	-43.77	First SDI Surface MWD Survey
2,656.00	2,509.51	-43.34	-734.00	Last SDI Surface MWD Survey
2,766.00	2,605.58	-43.85	-787.57	First SDI Production MWD Survey
9,180.00	8,671.40	-141.88	-2,600.14	Last SDI Production MWD Survey
9,236.00	8,727.13	-142.20	-2,605.62	Projection To TD
9,236.00	8,727.13	-142.20	-2,605.62	BHL = 630963.25, 1224334.79

Checked By: _____ Approved By: _____ Date: _____