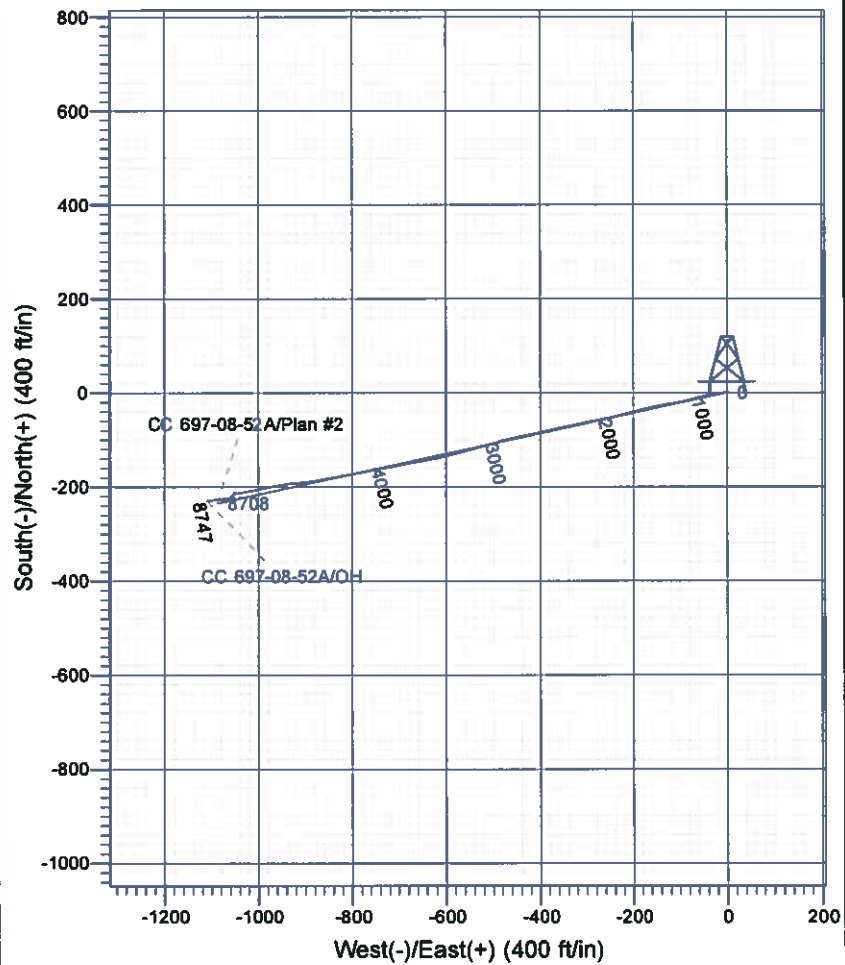
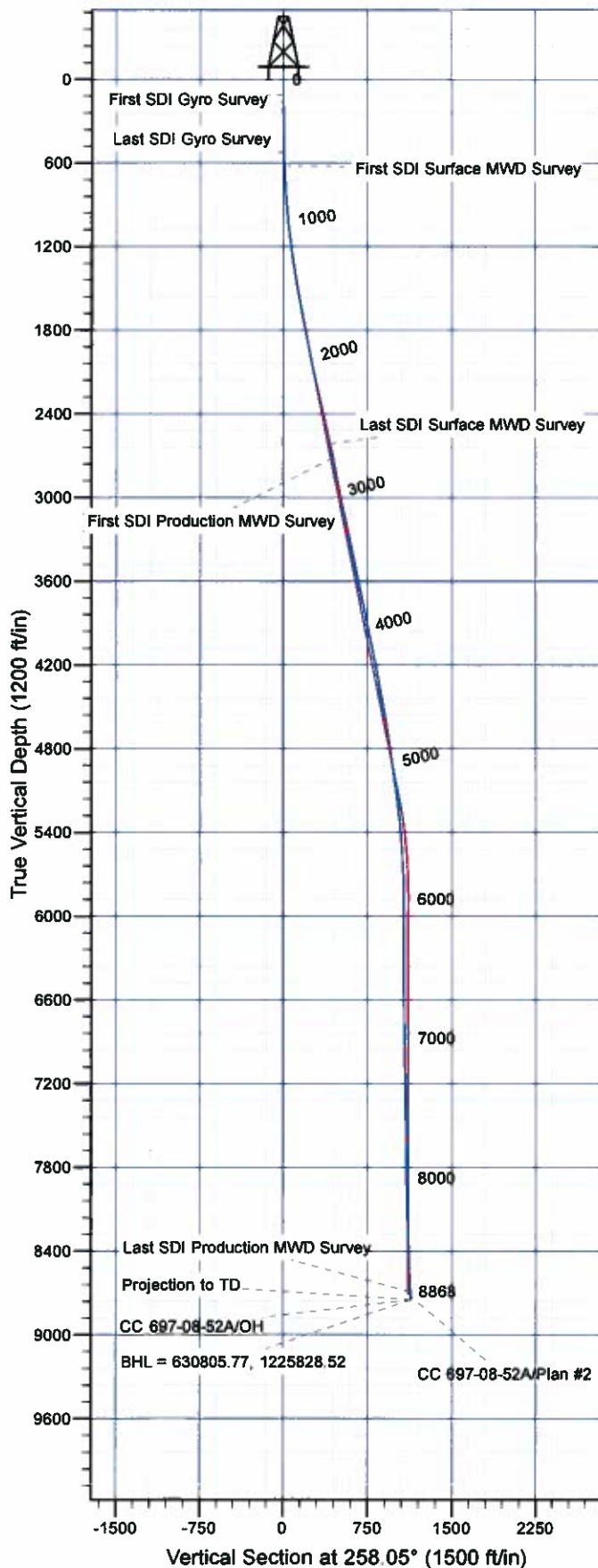




Scientific Drilling
Rocky Mountain Operations

Company: OXY USA RMAT
Project: Garfield County, CO NAD27
Site: Cascade Creek 697-08-53 Pad
Well: CC 697-08-52A
Wellbore: OH
Design: OH



Well Details: CC 697-08-52A

+N/-S	+E/-W	North	East	Latitude	Longitude	Slot
0.00	0.00	631002.36	1226944.34	39° 32' 2.033 N	108° 14' 28.339 W	S

REFERENCE INFORMATION

Co-ordinate (NE) Reference: Well CC 697-08-52A - Slot S, True North
Vertical (TVD) Reference: GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
Section (VS) Reference: Slot - S(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

11:01, October 11 2011
Created By: Janie Cooke

OXY USA RMAT

Garfield County, CO NAD27

Cascade Creek 697-08-53 Pad

CC 697-08-52A - Slot S

OH

Design: OH

Standard Survey Report

11 October, 2011



Scientific Drilling International, Inc.
Survey Report



Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well CC 697-08-52A - Slot S
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 697-08-52A	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 697-08-52A - Slot S				
Well Position	+N/-S	0.00 ft	Northing:	631,002.36 usft	Latitude: 39° 32' 2.033 N
	+E/-W	0.00 ft	Easting:	1,226,944.34 usft	Longitude: 108° 14' 28.339 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	09/01/2010	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	258.05	

Survey Program	Date	10/11/2011			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
110.00	528.00	Survey #1 - Gyro Survey (OH)	Standard Keeper 103	Standard Wireline Keeper ver 1.0.3	
619.00	2,661.00	Survey #2 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	
2,766.00	8,868.00	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	0.53	357.10	110.00	0.51	-0.03	-0.08	0.48	0.48	0.00	
First SDI Gyro Survey										
171.00	0.53	344.09	171.00	1.06	-0.12	-0.10	0.20	0.00	-21.33	
260.00	0.44	227.29	259.99	1.23	-0.48	0.22	0.93	-0.10	-131.24	
349.00	0.70	256.64	348.99	0.87	-1.26	1.05	0.43	0.29	32.98	
439.00	1.76	271.41	438.97	0.77	-3.18	2.95	1.22	1.18	16.41	
528.00	2.11	248.20	527.92	0.20	-6.07	5.89	0.96	0.39	-26.08	



Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well CC 697-08-52A - Slot S
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 697-08-52A	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)
Last SDI Gyro Survey									
619.00	2.38	249.79	618.85	-1.07	-9.39	9.41	0.30	0.30	1.75
First SDI Surface MWD Survey									
694.00	3.61	267.26	693.75	-1.73	-13.21	13.29	2.02	1.64	23.29
785.00	4.22	266.47	784.53	-2.07	-19.42	19.43	0.67	0.67	-0.87
875.00	5.63	265.59	874.20	-2.61	-27.12	27.08	1.57	1.57	-0.98
965.00	7.21	254.42	963.64	-4.47	-36.97	37.09	2.23	1.76	-12.41
1,060.00	8.00	255.13	1,057.80	-7.77	-49.10	49.64	0.84	0.83	0.75
1,155.00	9.06	256.71	1,151.75	-11.18	-62.77	63.72	1.14	1.12	1.66
1,249.00	10.20	253.72	1,244.42	-15.22	-77.96	79.42	1.32	1.21	-3.18
1,344.00	10.46	258.99	1,337.88	-19.22	-94.50	96.43	1.03	0.27	5.55
1,439.00	11.26	261.90	1,431.18	-22.18	-112.15	114.31	1.02	0.84	3.06
1,533.00	12.49	258.73	1,523.17	-25.46	-131.20	133.63	1.48	1.31	-3.37
1,628.00	13.81	258.29	1,615.68	-29.76	-152.38	155.24	1.39	1.39	-0.46
1,723.00	13.98	257.06	1,707.90	-34.64	-174.67	178.05	0.36	0.18	-1.29
1,817.00	13.37	254.78	1,799.23	-40.03	-196.22	200.26	0.87	-0.65	-2.43
1,912.00	13.10	255.22	1,891.71	-45.66	-217.23	221.98	0.30	-0.28	0.46
2,007.00	13.89	257.41	1,984.09	-50.89	-238.77	244.13	0.99	0.83	2.31
2,101.00	14.42	258.82	2,075.23	-55.62	-261.26	267.12	0.67	0.56	1.50
2,196.00	14.95	258.99	2,167.13	-60.26	-284.90	291.20	0.56	0.56	0.18
2,291.00	15.74	259.61	2,258.74	-64.92	-309.60	316.33	0.85	0.83	0.65
2,385.00	16.27	258.20	2,349.10	-69.91	-335.03	342.24	0.70	0.56	-1.50
2,480.00	17.23	256.89	2,440.07	-75.83	-361.76	369.62	1.09	1.01	-1.38
2,575.00	15.74	257.06	2,531.16	-81.90	-388.02	396.57	1.57	-1.57	0.18
2,661.00	14.51	257.94	2,614.18	-86.77	-409.93	419.01	1.45	-1.43	1.02
Last SDI Surface MWD Survey									
2,766.00	13.45	259.78	2,716.07	-91.68	-434.81	444.37	1.09	-1.01	1.75
First SDI Production MWD Survey									
2,860.00	13.89	258.63	2,807.40	-95.85	-456.63	466.58	0.55	0.47	-1.22
2,955.00	13.28	251.95	2,899.75	-101.47	-478.18	488.83	1.77	-0.64	-7.03
3,050.00	13.28	255.38	2,992.21	-107.61	-499.12	510.58	0.83	0.00	3.61
3,145.00	15.56	254.59	3,084.21	-113.75	-521.96	534.20	2.41	2.40	-0.83
3,239.00	14.68	254.33	3,174.96	-120.32	-545.58	558.67	0.94	-0.94	-0.28
3,334.00	15.56	255.12	3,266.67	-126.84	-569.49	583.41	0.95	0.93	0.83
3,429.00	14.51	256.35	3,358.42	-132.92	-593.37	608.03	1.16	-1.11	1.29
3,524.00	14.07	255.64	3,450.48	-138.59	-616.12	631.47	0.50	-0.46	-0.75
3,618.00	14.51	261.71	3,541.57	-143.13	-638.84	654.64	1.66	0.47	6.46
3,713.00	13.63	259.95	3,633.72	-146.80	-661.64	677.70	1.03	-0.93	-1.85
3,807.00	14.95	258.98	3,724.81	-151.05	-684.45	700.89	1.43	1.40	-1.03
3,902.00	14.33	259.25	3,816.73	-155.58	-708.03	724.90	0.66	-0.65	0.28
3,997.00	13.54	259.78	3,908.93	-159.75	-730.53	747.77	0.84	-0.83	0.56
4,091.00	14.60	258.28	4,000.11	-164.11	-752.96	770.62	1.19	1.13	-1.60
4,186.00	13.63	259.78	4,092.24	-168.52	-775.70	793.78	1.09	-1.02	1.58
4,281.00	14.68	259.60	4,184.35	-172.68	-798.55	817.00	1.11	1.11	-0.19



Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well CC 697-08-52A - Slot S
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 697-08-52A	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)
4,375.00	13.63	258.37	4,275.50	-177.07	-821.12	839.98	1.16	-1.12	-1.31
4,470.00	11.87	259.95	4,368.15	-181.03	-841.70	860.94	1.89	-1.85	1.66
4,565.00	13.54	259.95	4,460.82	-184.67	-862.27	881.83	1.76	1.76	0.00
4,660.00	11.96	260.30	4,553.48	-188.27	-882.93	902.78	1.67	-1.66	0.37
4,755.00	10.55	265.40	4,646.65	-190.63	-901.30	921.24	1.82	-1.48	5.37
4,849.00	9.85	265.75	4,739.17	-191.92	-917.90	937.74	0.75	-0.74	0.37
4,944.00	10.73	261.71	4,832.64	-193.79	-934.75	954.62	1.20	0.93	-4.25
5,039.00	10.82	260.39	4,925.96	-196.56	-952.29	972.36	0.28	0.09	-1.39
5,133.00	9.58	259.34	5,018.48	-199.48	-968.68	988.99	1.33	-1.32	-1.12
5,228.00	8.88	259.25	5,112.25	-202.31	-983.65	1,004.23	0.74	-0.74	-0.09
5,323.00	8.09	258.81	5,206.20	-204.97	-997.42	1,018.24	0.83	-0.83	-0.46
5,417.00	7.65	257.84	5,299.32	-207.57	-1,010.02	1,031.11	0.49	-0.47	-1.03
5,512.00	7.21	258.37	5,393.52	-210.11	-1,022.04	1,043.40	0.47	-0.46	0.56
5,607.00	5.36	258.37	5,487.95	-212.20	-1,032.23	1,053.80	1.95	-1.95	0.00
5,701.00	3.69	264.61	5,581.65	-213.37	-1,039.54	1,061.19	1.85	-1.78	6.64
5,796.00	3.43	263.56	5,676.47	-213.98	-1,045.41	1,067.06	0.28	-0.27	-1.11
5,891.00	2.37	272.26	5,771.34	-214.22	-1,050.19	1,071.79	1.21	-1.12	9.16
5,986.00	1.41	3.84	5,866.31	-212.98	-1,052.08	1,073.38	2.94	-1.01	96.40
6,080.00	0.53	64.04	5,960.30	-211.63	-1,051.61	1,072.64	1.31	-0.94	64.04
6,175.00	0.88	107.90	6,055.29	-211.66	-1,050.52	1,071.58	0.65	0.37	46.17
6,270.00	0.44	131.10	6,150.28	-212.13	-1,049.55	1,070.73	0.53	-0.46	24.42
6,364.00	0.26	152.99	6,244.28	-212.56	-1,049.18	1,070.46	0.24	-0.19	23.29
6,459.00	0.44	205.28	6,339.28	-213.08	-1,049.24	1,070.62	0.37	0.19	55.04
6,554.00	0.62	215.13	6,434.28	-213.83	-1,049.69	1,071.22	0.21	0.19	10.37
6,648.00	0.79	233.76	6,528.27	-214.63	-1,050.51	1,072.18	0.30	0.18	19.82
6,743.00	1.32	242.99	6,623.25	-215.51	-1,052.01	1,073.84	0.58	0.56	9.72
6,838.00	1.06	237.54	6,718.23	-216.48	-1,053.73	1,075.72	0.30	-0.27	-5.74
6,932.00	1.14	227.78	6,812.21	-217.57	-1,055.15	1,077.34	0.22	0.09	-10.38
7,027.00	1.41	225.23	6,907.19	-219.03	-1,056.68	1,079.14	0.29	0.28	-2.68
7,122.00	1.41	222.60	7,002.16	-220.72	-1,058.30	1,081.07	0.07	0.00	-2.77
7,217.00	1.41	225.67	7,097.13	-222.39	-1,059.93	1,083.01	0.08	0.00	3.23
7,311.00	1.32	227.34	7,191.11	-223.93	-1,061.55	1,084.92	0.10	-0.10	1.78
7,406.00	0.88	243.08	7,286.09	-225.01	-1,063.01	1,086.56	0.56	-0.46	16.57
7,501.00	1.06	261.53	7,381.08	-225.47	-1,064.53	1,088.14	0.38	0.19	19.42
7,596.00	0.88	262.85	7,476.06	-225.69	-1,066.12	1,089.75	0.19	-0.19	1.39
7,690.00	0.70	267.86	7,570.05	-225.80	-1,067.41	1,091.03	0.20	-0.19	5.33
7,785.00	0.79	267.86	7,665.04	-225.84	-1,068.65	1,092.25	0.09	0.09	0.00
7,879.00	1.14	274.54	7,759.03	-225.79	-1,070.23	1,093.79	0.39	0.37	7.11
7,974.00	0.97	284.82	7,854.02	-225.51	-1,071.95	1,095.41	0.27	-0.18	10.82
8,069.00	1.49	260.92	7,948.99	-225.50	-1,073.94	1,097.36	0.76	0.55	-25.16
8,164.00	1.93	260.13	8,043.95	-225.97	-1,076.74	1,100.19	0.46	0.46	-0.83
8,258.00	2.37	263.29	8,137.88	-226.47	-1,080.23	1,103.71	0.48	0.47	3.36
8,353.00	2.37	264.35	8,232.80	-226.89	-1,084.13	1,107.62	0.05	0.00	1.12



Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well CC 697-08-52A - Slot S
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 697-08-52A	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)
8,448.00	2.81	264.17	8,327.71	-227.32	-1,088.41	1,111.89	0.46	0.46	-0.19
8,542.00	2.90	263.73	8,421.59	-227.82	-1,093.06	1,116.54	0.10	0.10	-0.47
8,637.00	2.99	262.50	8,516.46	-228.40	-1,097.91	1,121.41	0.12	0.09	-1.29
8,731.00	2.99	262.15	8,610.34	-229.06	-1,102.77	1,126.30	0.02	0.00	-0.37
8,812.00	2.73	259.78	8,691.23	-229.69	-1,106.76	1,130.33	0.35	-0.32	-2.93
Last SDI Production MWD Survey									
8,868.00	2.73	259.78	8,747.17	-230.16	-1,109.38	1,133.00	0.00	0.00	0.00
Projection to TD - BHL = 630805.77, 1225828.52									

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
110.00	110.00	0.51	-0.03	First SDI Gyro Survey
528.00	527.92	0.20	-6.07	Last SDI Gyro Survey
619.00	618.85	-1.07	-9.39	First SDI Surface MWD Survey
2,661.00	2,614.18	-86.77	-409.93	Last SDI Surface MWD Survey
2,766.00	2,716.07	-91.68	-434.81	First SDI Production MWD Survey
8,812.00	8,691.23	-229.69	-1,106.76	Last SDI Production MWD Survey
8,868.00	8,747.17	-230.16	-1,109.38	Projection to TD
8,868.00	8,747.17	-230.16	-1,109.38	BHL = 630805.77, 1225828.52

Checked By: _____ Approved By: _____ Date: _____