



**B.P.**

**La Plata County, CO NAD83  
Southern Ute Tribal BK2 Pad  
Southern Ute Tribal BK2**

**OH**

**Design: OH**

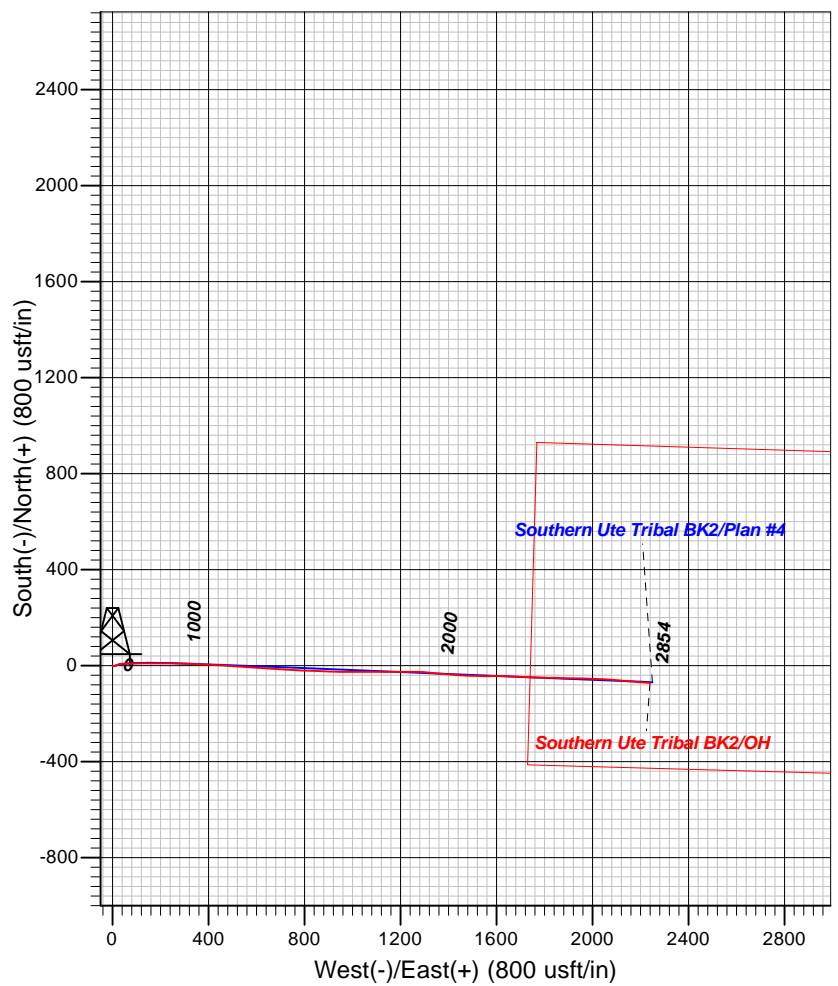
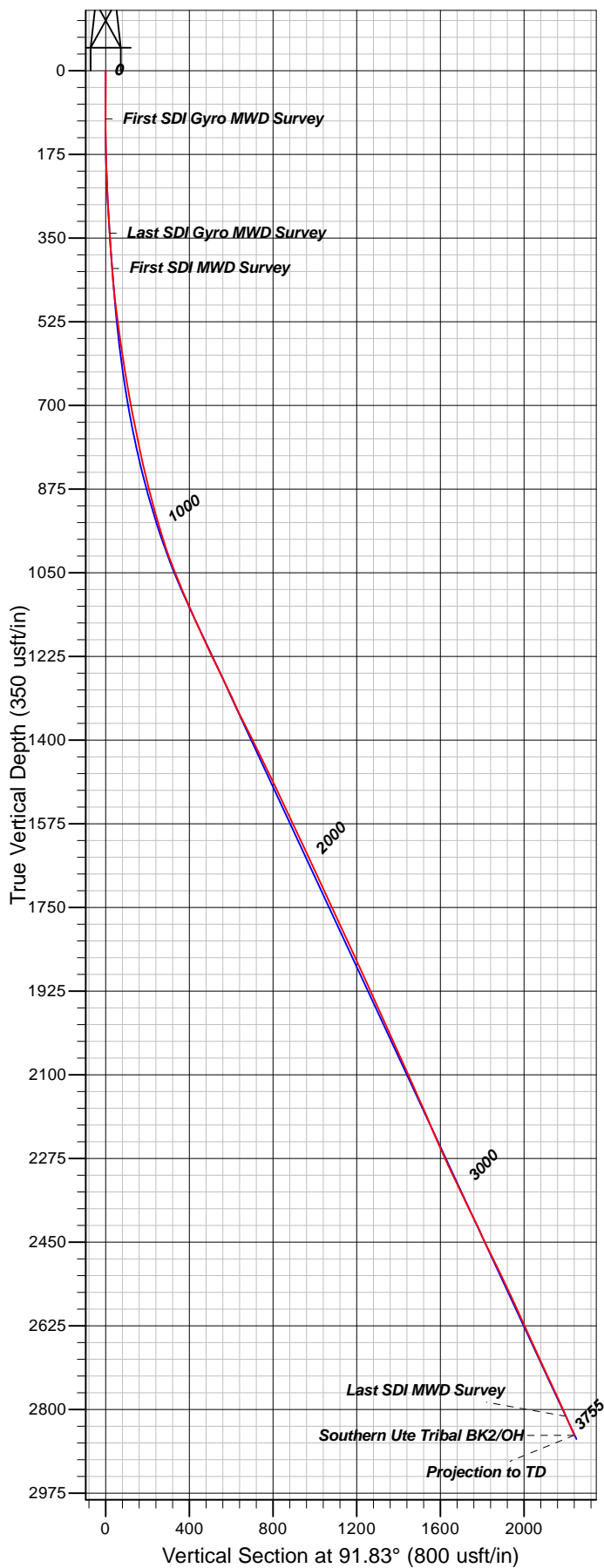
## **Standard Survey Report**

**02 February, 2017**





Company: B.P.  
Project: La Plata County, CO NAD83  
Site: Southern Ute Tribal BK2 Pad  
Well: Southern Ute Tribal BK2  
Wellbore: OH  
Design: OH



#### Well Details: Southern Ute Tribal BK2

TVD Reference: GL 6397.35' & RKB 11' @ 6408.35usft (Aztec 507)	Level: 6397.35	Slot			
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	1154165.30	2379483.07	37.0706524	-107.6269037

#### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Southern Ute Tribal BK2, Grid North  
Vertical (TVD) Reference: GL 6397.35' & RKB 11' @ 6408.35usft (Aztec 507)  
Section (VS) Reference: Slot - (0.00N, 0.00E)  
Measured Depth Reference: GL 6397.35' & RKB 11' @ 6408.35usft (Aztec 507)  
Calculation Method: Minimum Curvature

#### PROJECT DETAILS: La Plata County, CO NAD83

Geodetic System: US State Plane 1983  
Datum: North American Datum 1983  
Ellipsoid: GRS 1980  
Zone: Colorado Southern Zone

System Datum: Mean Sea Level

Plan: OH

17:25, February 02 2017  
Created By: Janie Collins



<b>Company:</b>	B.P.	<b>Local Co-ordinate Reference:</b>	Well Southern Ute Tribal BK2
<b>Project:</b>	La Plata County, CO NAD83	<b>TVD Reference:</b>	GL 6397.35' & RKB 11' @ 6408.35usft (Aztec 507)
<b>Site:</b>	Southern Ute Tribal BK2 Pad	<b>MD Reference:</b>	GL 6397.35' & RKB 11' @ 6408.35usft (Aztec 507)
<b>Well:</b>	Southern Ute Tribal BK2	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Grand Junction District

<b>Project</b>	La Plata County, CO NAD83		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Southern Zone		

<b>Site</b>	Southern Ute Tribal BK2 Pad			
<b>Site Position:</b>		<b>Northing:</b>	1,154,165.30 usft	<b>Latitude:</b> 37.0706523
<b>From:</b>	Map	<b>Easting:</b>	2,379,483.07 usft	<b>Longitude:</b> -107.6269038
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13.20 in	<b>Grid Convergence:</b> -1.30 °

<b>Well</b>	Southern Ute Tribal BK2			
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	1,154,165.30 usft
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	2,379,483.07 usft
<b>Position Uncertainty</b>	0.00 usft		<b>Wellhead Elevation:</b>	0.00 usft
			<b>Ground Level:</b>	6,397.35 usft

<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>
	HDGM	1/26/2017	9.17	63.65	50,142

<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) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	91.83	

<b>Survey Program</b>	<b>Date</b>	2/2/2017			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
101.00	341.00	Survey #1 - Gyro MWD Survey (OH)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4	
416.00	3,755.00	Survey #2 - MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
101.00	0.66	207.14	101.00	-0.52	-0.27	-0.25	0.65	0.65	0.00	
<b>First SDI Gyro MWD Survey</b>										
161.00	2.49	117.66	160.98	-1.43	0.73	0.78	4.28	3.05	-149.13	
221.00	5.28	94.88	220.84	-2.27	4.64	4.71	5.23	4.65	-37.97	
281.00	7.48	65.01	280.48	-0.85	10.93	10.95	6.52	3.67	-49.78	
341.00	9.17	67.88	339.84	2.60	18.90	18.81	2.90	2.82	4.78	
<b>Last SDI Gyro MWD Survey</b>										



<b>Company:</b>	B.P.	<b>Local Co-ordinate Reference:</b>	Well Southern Ute Tribal BK2
<b>Project:</b>	La Plata County, CO NAD83	<b>TVD Reference:</b>	GL 6397.35' & RKB 11' @ 6408.35usft (Aztec 507)
<b>Site:</b>	Southern Ute Tribal BK2 Pad	<b>MD Reference:</b>	GL 6397.35' & RKB 11' @ 6408.35usft (Aztec 507)
<b>Well:</b>	Southern Ute Tribal BK2	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Grand Junction District

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
416.00	10.27	78.77	413.77	6.15	31.00	30.78	2.85	1.47	14.52
<b>First SDI MWD Survey</b>									
447.00	11.86	81.89	444.19	7.14	36.86	36.61	5.48	5.13	10.06
478.00	14.36	85.74	474.39	7.87	43.85	43.58	8.54	8.06	12.42
509.00	16.36	88.44	504.28	8.28	52.05	51.76	6.85	6.45	8.71
540.00	17.07	89.29	533.97	8.45	60.96	60.66	2.42	2.29	2.74
570.00	17.67	90.52	562.60	8.46	69.92	69.61	2.34	2.00	4.10
601.00	18.83	89.73	592.04	8.44	79.62	79.32	3.83	3.74	-2.55
631.00	20.14	88.87	620.32	8.57	89.63	89.31	4.47	4.37	-2.87
662.00	21.04	88.65	649.34	8.81	100.53	100.20	2.91	2.90	-0.71
692.00	22.02	88.39	677.25	9.09	111.54	111.19	3.28	3.27	-0.87
722.00	23.61	89.12	704.90	9.34	123.16	122.80	5.38	5.30	2.43
753.00	25.04	90.10	733.15	9.42	135.93	135.56	4.79	4.61	3.16
783.00	24.86	90.25	760.35	9.39	148.59	148.21	0.64	-0.60	0.50
813.00	25.59	90.07	787.48	9.35	161.37	160.99	2.45	2.43	-0.60
844.00	26.63	90.04	815.32	9.34	175.02	174.63	3.36	3.35	-0.10
874.00	27.89	89.96	841.99	9.34	188.76	188.36	4.20	4.20	-0.27
904.00	29.66	89.84	868.28	9.36	203.20	202.80	5.90	5.90	-0.40
935.00	31.44	89.79	894.98	9.41	218.95	218.54	5.74	5.74	-0.16
965.00	32.57	90.41	920.42	9.39	234.85	234.43	3.92	3.77	2.07
997.00	33.41	90.65	947.26	9.22	252.28	251.85	2.66	2.63	0.75
1,029.00	35.31	90.01	973.67	9.12	270.33	269.91	6.04	5.94	-2.00
1,060.00	37.66	90.57	998.60	9.03	288.77	288.33	7.66	7.58	1.81
1,092.00	40.31	91.77	1,023.47	8.61	308.89	308.46	8.61	8.28	3.75
1,123.00	41.76	92.79	1,046.85	7.80	329.23	328.81	5.15	4.68	3.29
1,155.00	43.39	93.25	1,070.42	6.66	350.84	350.45	5.19	5.09	1.44
1,187.00	45.35	93.49	1,093.29	5.34	373.18	372.82	6.15	6.13	0.75
1,218.00	45.70	93.32	1,115.01	4.03	395.26	394.93	1.19	1.13	-0.55
1,250.00	45.10	93.37	1,137.48	2.70	418.01	417.71	1.88	-1.88	0.16
1,282.00	45.38	93.19	1,160.01	1.40	440.69	440.42	0.96	0.88	-0.56
1,313.00	45.18	92.98	1,181.82	0.21	462.69	462.45	0.80	-0.65	-0.68
1,345.00	46.40	93.02	1,204.13	-0.99	485.59	485.38	3.81	3.81	0.13
1,377.00	48.06	93.86	1,225.86	-2.40	509.04	508.86	5.53	5.19	2.63
1,408.00	48.57	94.16	1,246.48	-4.02	532.14	531.99	1.80	1.65	0.97
1,440.00	48.05	94.31	1,267.76	-5.79	555.97	555.87	1.66	-1.63	0.47
1,471.00	47.76	93.88	1,288.54	-7.43	578.91	578.85	1.39	-0.94	-1.39
1,503.00	47.00	93.42	1,310.21	-8.93	602.41	602.39	2.60	-2.38	-1.44
1,534.00	46.33	92.93	1,331.49	-10.18	624.92	624.93	2.45	-2.16	-1.58
1,566.00	47.35	92.78	1,353.38	-11.34	648.24	648.27	3.21	3.19	-0.47
1,597.00	49.09	93.51	1,374.03	-12.61	671.32	671.38	5.88	5.61	2.35
1,660.00	49.54	94.36	1,415.10	-15.89	718.98	719.12	1.25	0.71	1.35
1,692.00	48.72	93.05	1,436.04	-17.45	743.12	743.30	4.02	-2.56	-4.09



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<b>Site:</b>	Southern Ute Tribal BK2 Pad	<b>MD Reference:</b>	GL 6397.35' & RKB 11' @ 6408.35usft (Aztec 507)
<b>Well:</b>	Southern Ute Tribal BK2	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Grand Junction District

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
1,787.00	47.68	92.62	1,499.36	-20.96	813.85	814.11	1.15	-1.09	-0.45	
1,850.00	46.98	91.88	1,542.06	-22.78	860.14	860.43	1.41	-1.11	-1.17	
1,913.00	46.24	92.18	1,585.34	-24.40	905.89	906.21	1.22	-1.17	0.48	
1,976.00	47.58	91.17	1,628.37	-25.74	951.88	952.22	2.43	2.13	-1.60	
2,008.00	47.32	90.57	1,650.01	-26.10	975.45	975.79	1.60	-0.81	-1.88	
2,040.00	46.73	90.15	1,671.83	-26.25	998.86	999.19	2.08	-1.84	-1.31	
2,103.00	45.95	89.84	1,715.32	-26.24	1,044.44	1,044.74	1.29	-1.24	-0.49	
2,134.00	46.91	89.19	1,736.69	-26.05	1,066.90	1,067.19	3.45	3.10	-2.10	
2,166.00	47.19	89.21	1,758.49	-25.73	1,090.32	1,090.58	0.88	0.88	0.06	
2,198.00	47.48	90.62	1,780.18	-25.69	1,113.85	1,114.10	3.36	0.91	4.41	
2,229.00	46.99	90.90	1,801.23	-25.99	1,136.60	1,136.85	1.71	-1.58	0.90	
2,261.00	46.48	90.29	1,823.16	-26.24	1,159.90	1,160.15	2.11	-1.59	-1.91	
2,292.00	45.86	89.64	1,844.63	-26.22	1,182.27	1,182.50	2.51	-2.00	-2.10	
2,324.00	45.36	88.77	1,867.01	-25.91	1,205.13	1,205.34	2.49	-1.56	-2.72	
2,356.00	45.95	89.30	1,889.38	-25.52	1,228.01	1,228.20	2.19	1.84	1.66	
2,387.00	46.85	90.88	1,910.76	-25.56	1,250.46	1,250.64	4.70	2.90	5.10	
2,419.00	46.93	91.58	1,932.63	-26.06	1,273.82	1,274.00	1.62	0.25	2.19	
2,450.00	46.46	94.12	1,953.89	-27.18	1,296.34	1,296.55	6.15	-1.52	8.19	
2,482.00	46.00	95.64	1,976.03	-29.14	1,319.37	1,319.63	3.72	-1.44	4.75	
2,513.00	45.72	95.41	1,997.62	-31.29	1,341.51	1,341.83	1.05	-0.90	-0.74	
2,545.00	45.22	95.32	2,020.06	-33.42	1,364.22	1,364.59	1.58	-1.56	-0.28	
2,577.00	44.87	95.00	2,042.67	-35.46	1,386.78	1,387.20	1.30	-1.09	-1.00	
2,608.00	45.85	94.39	2,064.45	-37.26	1,408.76	1,409.23	3.46	3.16	-1.97	
2,640.00	46.26	94.50	2,086.66	-39.05	1,431.73	1,432.25	1.30	1.28	0.34	
2,671.00	45.77	94.50	2,108.19	-40.80	1,453.97	1,454.53	1.58	-1.58	0.00	
2,703.00	45.83	92.49	2,130.50	-42.19	1,476.86	1,477.46	4.51	0.19	-6.28	
2,735.00	45.61	90.97	2,152.84	-42.89	1,499.76	1,500.37	3.47	-0.69	-4.75	
2,766.00	44.91	90.52	2,174.66	-43.17	1,521.78	1,522.38	2.48	-2.26	-1.45	
2,798.00	44.46	89.96	2,197.41	-43.27	1,544.28	1,544.87	1.87	-1.41	-1.75	
2,829.00	45.22	89.71	2,219.39	-43.20	1,566.14	1,566.72	2.52	2.45	-0.81	
2,861.00	45.25	90.18	2,241.93	-43.18	1,588.86	1,589.43	1.05	0.09	1.47	
2,893.00	44.67	90.90	2,264.57	-43.40	1,611.47	1,612.03	2.41	-1.81	2.25	
2,924.00	45.74	91.21	2,286.41	-43.80	1,633.46	1,634.03	3.52	3.45	1.00	
2,956.00	47.62	92.15	2,308.36	-44.49	1,656.73	1,657.31	6.25	5.88	2.94	
2,987.00	47.84	92.81	2,329.22	-45.48	1,679.65	1,680.25	1.73	0.71	2.13	
3,019.00	48.03	92.74	2,350.65	-46.63	1,703.38	1,704.00	0.62	0.59	-0.22	
3,051.00	48.61	92.63	2,371.93	-47.75	1,727.25	1,727.90	1.83	1.81	-0.34	
3,083.00	48.37	92.45	2,393.14	-48.81	1,751.19	1,751.86	0.86	-0.75	-0.56	
3,114.00	47.36	91.87	2,413.94	-49.68	1,774.16	1,774.85	3.54	-3.26	-1.87	
3,146.00	46.14	91.20	2,435.86	-50.30	1,797.46	1,798.15	4.11	-3.81	-2.09	
3,178.00	46.46	90.62	2,457.97	-50.67	1,820.59	1,821.28	1.65	1.00	-1.81	
3,209.00	48.16	91.43	2,478.99	-51.08	1,843.38	1,844.07	5.81	5.48	2.61	



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<b>Site:</b>	Southern Ute Tribal BK2 Pad	<b>MD Reference:</b>	GL 6397.35' & RKB 11' @ 6408.35usft (Aztec 507)
<b>Well:</b>	Southern Ute Tribal BK2	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Grand Junction District

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
3,240.00	48.99	92.09	2,499.50	-51.80	1,866.61	1,867.31	3.12	2.68	2.13	
3,271.00	48.80	91.95	2,519.88	-52.62	1,889.95	1,890.67	0.70	-0.61	-0.45	
3,303.00	47.99	91.19	2,541.13	-53.28	1,913.87	1,914.60	3.09	-2.53	-2.38	
3,335.00	47.14	90.37	2,562.72	-53.60	1,937.49	1,938.21	3.26	-2.66	-2.56	
3,366.00	46.57	90.71	2,583.92	-53.81	1,960.10	1,960.82	2.01	-1.84	1.10	
3,398.00	45.70	90.66	2,606.10	-54.09	1,983.17	1,983.89	2.72	-2.72	-0.16	
3,429.00	45.06	91.34	2,627.87	-54.47	2,005.23	2,005.95	2.59	-2.06	2.19	
3,461.00	45.38	93.26	2,650.41	-55.38	2,027.93	2,028.66	4.37	1.00	6.00	
3,493.00	46.11	94.18	2,672.74	-56.87	2,050.80	2,051.57	3.07	2.28	2.88	
3,524.00	46.94	94.24	2,694.07	-58.52	2,073.23	2,074.04	2.68	2.68	0.19	
3,555.00	47.31	95.16	2,715.17	-60.39	2,095.87	2,096.73	2.48	1.19	2.97	
3,587.00	46.91	94.91	2,736.94	-62.44	2,119.23	2,120.14	1.37	-1.25	-0.78	
3,619.00	46.78	94.56	2,758.83	-64.37	2,142.49	2,143.46	0.90	-0.41	-1.09	
3,651.00	46.38	94.80	2,780.83	-66.27	2,165.66	2,166.67	1.36	-1.25	0.75	
3,682.00	45.53	94.25	2,802.38	-68.03	2,187.87	2,188.93	3.02	-2.74	-1.77	
3,699.00	45.03	93.72	2,814.34	-68.86	2,199.92	2,201.00	3.68	-2.94	-3.12	
Last SDI MWD Survey										
3,755.00	45.03	93.72	2,853.92	-71.44	2,239.46	2,240.60	0.00	0.00	0.00	
Projection to TD										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
101.00	101.00	-0.52	-0.27	First SDI Gyro MWD Survey	
341.00	339.84	2.60	18.90	Last SDI Gyro MWD Survey	
416.00	413.77	6.15	31.00	First SDI MWD Survey	
3,699.00	2,814.34	-68.86	2,199.92	Last SDI MWD Survey	
3,755.00	2,853.92	-71.44	2,239.46	Projection to TD	

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

# **SUPPORT STAFF**

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