



Directional Survey Certification

2948 I-70 Business Loop
Grand Junction, CO 81504
(970)-245-9447 Fax (970)-245-9454

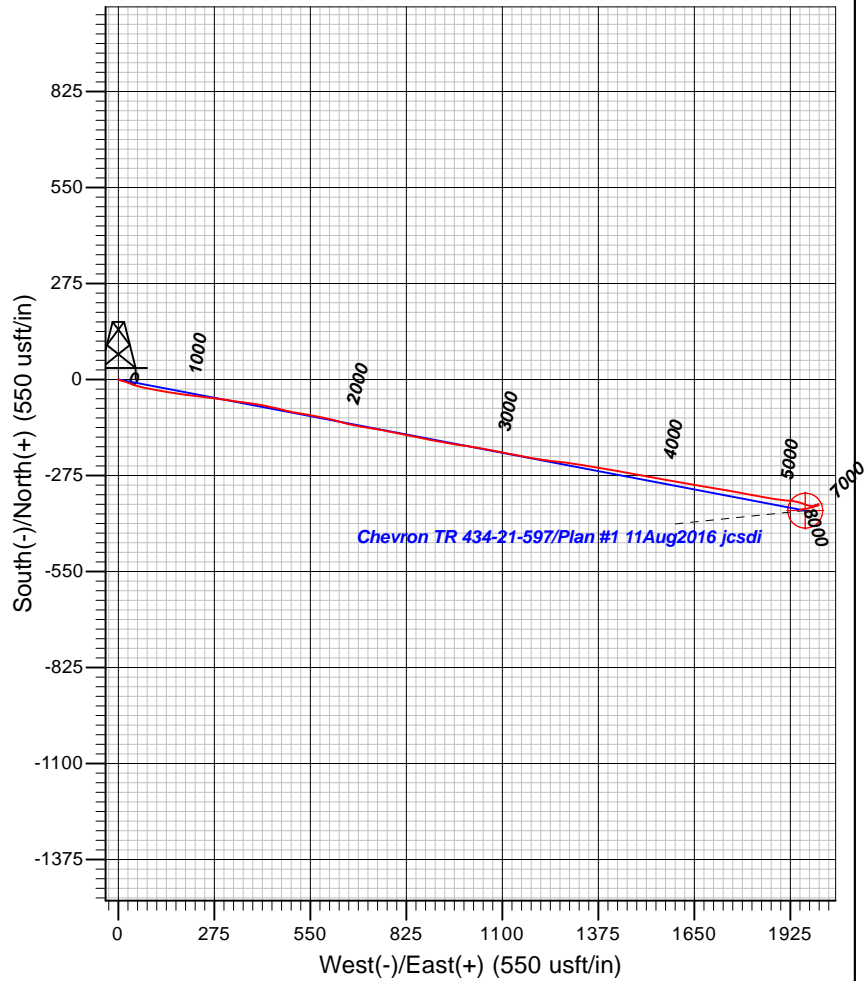
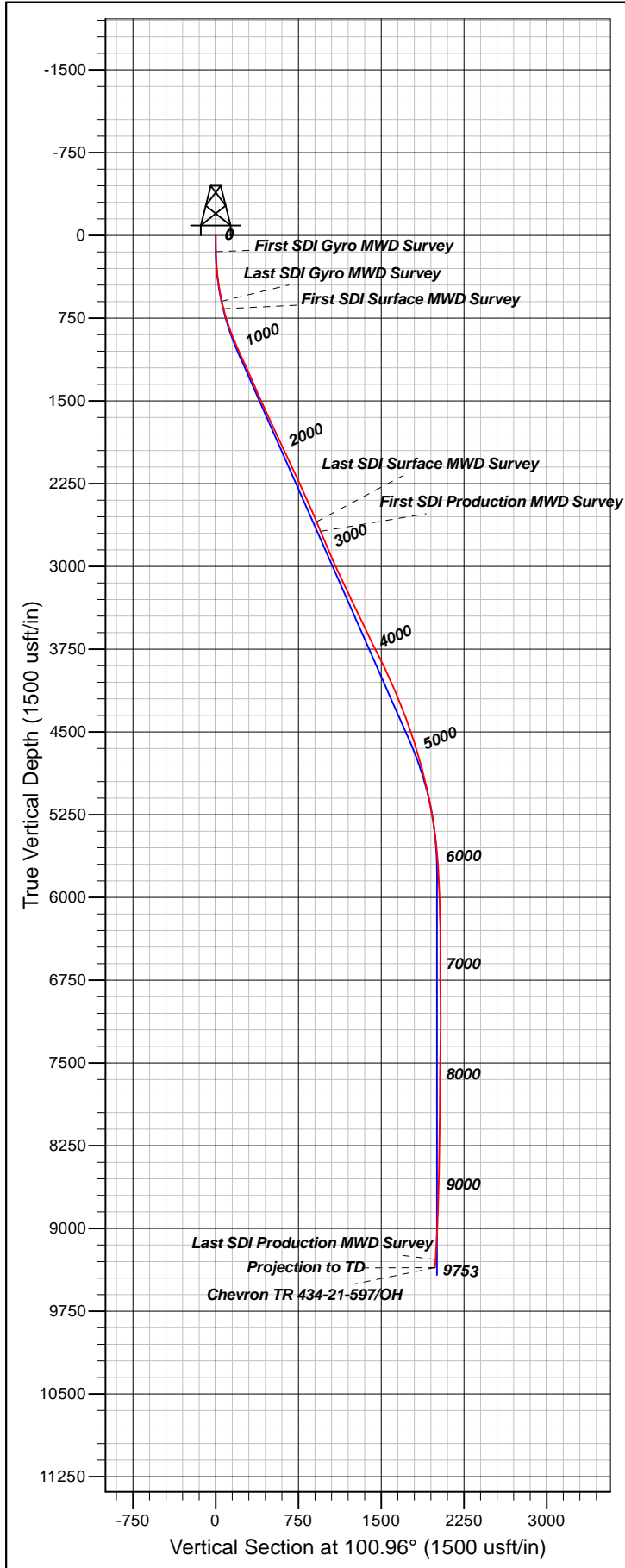
Operator	TEP Rocky Mountain, LLC
Well Name & No.	TR 434-21-597
County & State	Garfield, CO
SDI Job No.	420217DEFK416875 & OP.000494
Rig	H&P 271

I, Janie Collins, having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 147 feet to a measured depth of 9,753 feet is true and correct as determined from all available records.


Signature

11-Apr-17
Date

Janie Collins
Colorado District Well Planner
Scientific Drilling International



Well Details: Chevron TR 434-21-597

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	1653176.70	2215050.80	39.5937186	-108.2858342	TR 434-21-597

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Chevron TR 434-21-597 - Slot B11 (TR 434-21-597), True North
 Vertical (TVD) Reference: GL 8292' & RKB 24' @ 8316.00usft (H&P 271)
 Section (VS) Reference: Slot - B11 (TR 434-21-597)(0.00N, 0.00E)
 Measured Depth Reference: GL 8292' & RKB 24' @ 8316.00usft (H&P 271)
 Calculation Method: Minimum Curvature

PROJECT DETAILS: Garfield County, CO NAD83

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

System Datum: Mean Sea Level

Plan: OH

10:23, April 11 2017
 Created By: Janie Collins

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well Chevron TR 434-21-597 - Slot B11 (TR 434-21-597)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 8292' & RKB 24' @ 8316.00usft (H&P 271)
Site:	TR 24-21-597 Pad	MD Reference:	GL 8292' & RKB 24' @ 8316.00usft (H&P 271)
Well:	Chevron TR 434-21-597	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Project	Garfield County, CO NAD83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site		TR 24-21-597 Pad			
Site Position:		Northing:	1,653,248.80 usft	Latitude:	39.5939185
From:	Map	Easting:	2,215,073.70 usft	Longitude:	-108.2857609
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.76 °

Well		Chevron TR 434-21-597 - Slot B11 (TR 434-21-597)				
Well Position	+N/-S	0.00 usft	Northing:	1,653,176.70 usft	Latitude:	39.5937187
	+E/-W	0.00 usft	Easting:	2,215,050.80 usft	Longitude:	-108.2858342
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	8,292.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	2/7/2017	9.83	65.92	51,657
	HDGM	4/4/2017	9.82	65.92	51,639

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	100.96	

Survey Program	Date	4/11/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
147.00	600.00	Survey #1 - Gyro Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
671.00	2,779.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
2,873.00	9,753.00	Survey #3 - Production MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	

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)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
147.00	1.41	111.97	146.99	-0.68	1.68	1.78	0.96	0.96	0.00	
First SDI Gyro MWD Survey										
237.00	3.08	115.31	236.91	-2.12	4.89	5.20	1.86	1.86	3.71	
329.00	5.37	104.33	328.66	-4.25	11.30	11.90	2.63	2.49	-11.93	
420.00	7.74	106.79	419.06	-7.07	21.29	22.25	2.62	2.60	2.70	
510.00	10.21	112.15	507.95	-11.83	34.48	36.10	2.89	2.74	5.96	

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well Chevron TR 434-21-597 - Slot B11 (TR 434-21-597)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 8292' & RKB 24' @ 8316.00usft (H&P 271)
Site:	TR 24-21-597 Pad	MD Reference:	GL 8292' & RKB 24' @ 8316.00usft (H&P 271)
Well:	Chevron TR 434-21-597	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	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)
600.00	12.49	108.28	596.19	-17.89	51.11	53.58	2.67	2.53	-4.30
Last SDI Gyro MWD Survey									
671.00	14.15	102.84	665.28	-22.23	66.87	69.87	2.93	2.34	-7.66
First SDI Surface MWD Survey									
764.00	16.83	100.30	754.89	-27.16	91.20	94.70	2.97	2.88	-2.73
857.00	20.12	100.07	843.09	-32.37	120.20	124.17	3.54	3.54	-0.25
951.00	22.34	98.69	930.70	-37.90	153.79	158.19	2.42	2.36	-1.47
1,046.00	23.86	97.80	1,018.08	-43.23	190.67	195.41	1.64	1.60	-0.94
1,140.00	25.15	96.84	1,103.61	-48.19	229.34	234.32	1.44	1.37	-1.02
1,235.00	24.58	97.49	1,189.81	-53.17	268.98	274.18	0.67	-0.60	0.68
1,330.00	23.63	98.44	1,276.52	-58.54	307.40	312.92	1.08	-1.00	1.00
1,424.00	23.58	97.17	1,362.66	-63.65	344.69	350.50	0.54	-0.05	-1.35
1,519.00	24.07	98.15	1,449.56	-68.77	382.72	388.81	0.66	0.52	1.03
1,613.00	24.78	101.60	1,535.15	-75.45	421.00	427.66	1.69	0.76	3.67
1,708.00	24.86	104.25	1,621.38	-84.37	459.85	467.51	1.17	0.08	2.79
1,802.00	24.86	101.67	1,706.67	-93.23	498.36	506.99	1.15	0.00	-2.74
1,897.00	24.96	98.88	1,792.84	-100.36	537.72	546.99	1.24	0.11	-2.94
1,991.00	25.06	100.85	1,878.03	-107.17	576.87	586.72	0.89	0.11	2.10
2,086.00	24.78	105.60	1,964.19	-116.31	615.81	626.69	2.13	-0.29	5.00
2,180.00	24.83	103.68	2,049.52	-126.28	653.96	666.04	0.86	0.05	-2.04
2,275.00	24.90	100.78	2,135.72	-134.74	692.98	705.96	1.29	0.07	-3.05
2,370.00	25.19	98.39	2,221.79	-141.43	732.63	746.16	1.11	0.31	-2.52
2,464.00	25.24	101.32	2,306.83	-148.28	772.08	786.19	1.33	0.05	3.12
2,559.00	24.34	101.98	2,393.08	-156.32	811.09	826.01	0.99	-0.95	0.69
2,653.00	23.64	101.55	2,478.96	-164.12	848.50	864.23	0.77	-0.74	-0.46
2,748.00	23.02	101.01	2,566.19	-171.48	885.40	901.85	0.69	-0.65	-0.57
2,779.00	22.53	100.77	2,594.77	-173.74	897.18	913.85	1.61	-1.58	-0.77
Last SDI Surface MWD Survey									
2,873.00	22.51	99.82	2,681.60	-180.18	932.60	949.85	0.39	-0.02	-1.01
First SDI Production MWD Survey									
2,968.00	23.13	99.17	2,769.17	-186.25	968.94	986.68	0.70	0.65	-0.68
3,062.00	22.77	98.24	2,855.73	-191.80	1,005.17	1,023.30	0.54	-0.38	-0.99
3,157.00	24.01	99.56	2,942.92	-197.65	1,042.43	1,060.99	1.42	1.31	1.39
3,251.00	24.97	102.37	3,028.46	-205.07	1,080.67	1,099.95	1.61	1.02	2.99
3,346.00	25.32	101.14	3,114.46	-213.30	1,120.19	1,140.31	0.66	0.37	-1.29
3,440.00	25.94	99.91	3,199.21	-220.72	1,160.16	1,180.96	0.87	0.66	-1.31
3,535.00	24.27	99.38	3,285.24	-227.48	1,199.90	1,221.26	1.77	-1.76	-0.56
3,629.00	25.76	96.92	3,370.42	-233.09	1,239.24	1,260.95	1.93	1.59	-2.62
3,724.00	26.03	97.62	3,455.88	-238.34	1,280.39	1,302.35	0.43	0.28	0.74
3,818.00	25.76	98.50	3,540.44	-244.09	1,321.04	1,343.35	0.50	-0.29	0.94
3,913.00	25.59	99.38	3,626.06	-250.49	1,361.70	1,384.48	0.44	-0.18	0.93
4,007.00	26.12	99.47	3,710.65	-257.20	1,402.14	1,425.46	0.57	0.56	0.10
4,102.00	26.56	100.17	3,795.79	-264.39	1,443.67	1,467.60	0.57	0.46	0.74

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well Chevron TR 434-21-597 - Slot B11 (TR 434-21-597)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 8292' & RKB 24' @ 8316.00usft (H&P 271)
Site:	TR 24-21-597 Pad	MD Reference:	GL 8292' & RKB 24' @ 8316.00usft (H&P 271)
Well:	Chevron TR 434-21-597	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	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)
4,196.00	26.47	100.79	3,879.90	-272.02	1,484.93	1,509.57	0.31	-0.10	0.66
4,291.00	25.24	100.70	3,965.39	-279.75	1,525.63	1,550.99	1.30	-1.29	-0.09
4,385.00	23.65	99.73	4,050.96	-286.66	1,563.91	1,589.89	1.74	-1.69	-1.03
4,480.00	23.13	99.73	4,138.16	-293.03	1,601.08	1,627.59	0.55	-0.55	0.00
4,574.00	21.02	100.44	4,225.26	-299.21	1,635.86	1,662.91	2.26	-2.24	0.76
4,669.00	21.46	99.73	4,313.81	-305.23	1,669.75	1,697.32	0.54	0.46	-0.75
4,763.00	20.66	99.47	4,401.53	-310.86	1,703.05	1,731.09	0.86	-0.85	-0.28
4,858.00	19.26	99.82	4,490.82	-316.29	1,735.02	1,763.51	1.48	-1.47	0.37
4,952.00	18.03	99.64	4,579.88	-321.37	1,764.64	1,793.56	1.31	-1.31	-0.19
5,047.00	17.23	100.70	4,670.42	-326.45	1,792.96	1,822.32	0.91	-0.84	1.12
5,141.00	16.18	101.05	4,760.45	-331.54	1,819.50	1,849.34	1.12	-1.12	0.37
5,236.00	14.55	100.56	4,852.06	-336.27	1,844.22	1,874.51	1.72	-1.72	-0.52
5,330.00	12.93	101.93	4,943.36	-340.61	1,866.12	1,896.84	1.76	-1.72	1.46
5,425.00	11.96	94.72	5,036.13	-343.61	1,886.33	1,917.25	1.93	-1.02	-7.59
5,520.00	10.90	96.48	5,129.25	-345.44	1,905.07	1,935.99	1.17	-1.12	1.85
5,614.00	10.38	95.16	5,221.63	-347.20	1,922.33	1,953.28	0.61	-0.55	-1.40
5,709.00	9.06	100.70	5,315.27	-349.36	1,938.20	1,969.27	1.70	-1.39	5.83
5,803.00	7.30	105.97	5,408.31	-352.38	1,951.22	1,982.63	2.03	-1.87	5.61
5,898.00	6.60	111.69	5,502.61	-356.06	1,962.10	1,994.00	1.04	-0.74	6.02
5,992.00	4.75	104.30	5,596.15	-359.01	1,970.89	2,003.20	2.11	-1.97	-7.86
6,087.00	4.40	107.55	5,690.85	-361.08	1,978.17	2,010.74	0.46	-0.37	3.42
6,181.00	3.08	102.11	5,784.65	-362.70	1,984.08	2,016.85	1.45	-1.40	-5.79
6,275.00	2.90	81.71	5,878.52	-362.89	1,988.90	2,021.62	1.14	-0.19	-21.70
6,370.00	2.55	75.47	5,973.41	-362.01	1,993.33	2,025.80	0.48	-0.37	-6.57
6,465.00	1.85	73.54	6,068.34	-361.05	1,996.84	2,029.06	0.74	-0.74	-2.03
6,559.00	1.41	76.18	6,162.30	-360.34	1,999.42	2,031.46	0.47	-0.47	2.81
6,654.00	0.97	68.36	6,257.28	-359.77	2,001.30	2,033.20	0.49	-0.46	-8.23
6,748.00	0.62	87.25	6,351.27	-359.45	2,002.55	2,034.36	0.46	-0.37	20.10
6,843.00	0.26	138.67	6,446.27	-359.58	2,003.21	2,035.03	0.53	-0.38	54.13
6,938.00	0.70	256.18	6,541.27	-359.89	2,002.79	2,034.68	0.90	0.46	123.69
7,032.00	1.06	327.72	6,635.26	-359.29	2,001.76	2,033.56	1.14	0.38	76.11
7,127.00	0.97	54.73	6,730.25	-358.08	2,001.95	2,033.52	1.47	-0.09	91.59
7,221.00	1.06	66.60	6,824.24	-357.28	2,003.40	2,034.78	0.24	0.10	12.63
7,316.00	0.79	81.80	6,919.22	-356.83	2,004.85	2,036.13	0.38	-0.28	16.00
7,410.00	0.70	143.06	7,013.22	-357.20	2,005.84	2,037.17	0.81	-0.10	65.17
7,505.00	0.79	195.62	7,108.21	-358.29	2,006.01	2,037.54	0.70	0.09	55.33
7,599.00	1.41	218.12	7,202.19	-359.83	2,005.12	2,036.96	0.79	0.66	23.94
7,694.00	0.35	269.71	7,297.18	-360.75	2,004.11	2,036.14	1.29	-1.12	54.31
7,788.00	0.62	244.75	7,391.18	-360.97	2,003.37	2,035.45	0.36	0.29	-26.55
7,883.00	1.41	244.93	7,486.16	-361.68	2,001.84	2,034.09	0.83	0.83	0.19
7,978.00	0.26	308.56	7,581.15	-362.04	2,000.61	2,032.96	1.38	-1.21	66.98
8,072.00	0.18	265.67	7,675.15	-361.92	2,000.30	2,032.63	0.19	-0.09	-45.63
8,167.00	1.23	277.71	7,770.14	-361.80	1,999.14	2,031.46	1.11	1.11	12.67

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well Chevron TR 434-21-597 - Slot B11 (TR 434-21-597)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 8292' & RKB 24' @ 8316.00usft (H&P 271)
Site:	TR 24-21-597 Pad	MD Reference:	GL 8292' & RKB 24' @ 8316.00usft (H&P 271)
Well:	Chevron TR 434-21-597	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	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)	
8,261.00	1.58	331.15	7,864.12	-360.53	1,997.52	2,029.63	1.38	0.37	56.85	
8,356.00	0.70	51.39	7,959.10	-359.02	1,997.34	2,029.16	1.70	-0.93	84.46	
8,450.00	0.35	123.55	8,053.10	-358.82	1,998.03	2,029.80	0.72	-0.37	76.77	
8,545.00	1.23	220.67	8,148.09	-359.75	1,997.60	2,029.56	1.39	0.93	102.23	
8,639.00	3.52	231.22	8,242.00	-362.32	1,994.70	2,027.20	2.47	2.44	11.22	
8,734.00	2.37	224.36	8,336.88	-365.55	1,991.05	2,024.23	1.26	-1.21	-7.22	
8,828.00	0.62	277.53	8,430.84	-366.88	1,989.19	2,022.65	2.19	-1.86	56.56	
8,923.00	1.23	276.30	8,525.83	-366.70	1,987.66	2,021.13	0.64	0.64	-1.29	
9,018.00	1.32	280.52	8,620.81	-366.39	1,985.57	2,019.01	0.14	0.09	4.44	
9,112.00	1.58	261.19	8,714.78	-366.39	1,983.23	2,016.71	0.59	0.28	-20.56	
9,207.00	2.02	246.60	8,809.73	-367.25	1,980.40	2,014.10	0.67	0.46	-15.36	
9,301.00	2.55	243.61	8,903.66	-368.84	1,977.00	2,011.07	0.58	0.56	-3.18	
9,396.00	2.81	260.66	8,998.55	-370.16	1,972.81	2,007.20	0.88	0.27	17.95	
9,490.00	3.52	267.78	9,092.41	-370.64	1,967.66	2,002.23	0.86	0.76	7.57	
9,585.00	3.43	260.92	9,187.24	-371.20	1,961.93	1,996.72	0.45	-0.09	-7.22	
9,679.00	3.74	251.82	9,281.05	-372.60	1,956.25	1,991.40	0.69	0.33	-9.68	
Last SDI Production MWD Survey										
9,753.00	3.74	251.82	9,354.90	-374.11	1,951.66	1,987.19	0.00	0.00	0.00	
Projection to TD										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
147.00	146.99	-0.68	1.68	First SDI Gyro MWD Survey	
600.00	596.19	-17.89	51.11	Last SDI Gyro MWD Survey	
671.00	665.28	-22.23	66.87	First SDI Surface MWD Survey	
2,779.00	2,594.77	-173.74	897.18	Last SDI Surface MWD Survey	
2,873.00	2,681.60	-180.18	932.60	First SDI Production MWD Survey	
9,679.00	9,281.05	-372.60	1,956.25	Last SDI Production MWD Survey	
9,753.00	9,354.90	-374.11	1,951.66	Projection to TD	

Checked By: _____ Approved By: _____ Date: _____