



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.	RU 31-7
County & State	Garfield, CO
SDI Job No.	420916DEFK386714
Rig	H&P 318

I, Janie Collins, having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 115 feet to a measured depth of 9,937 feet is true and correct as determined from all available records.

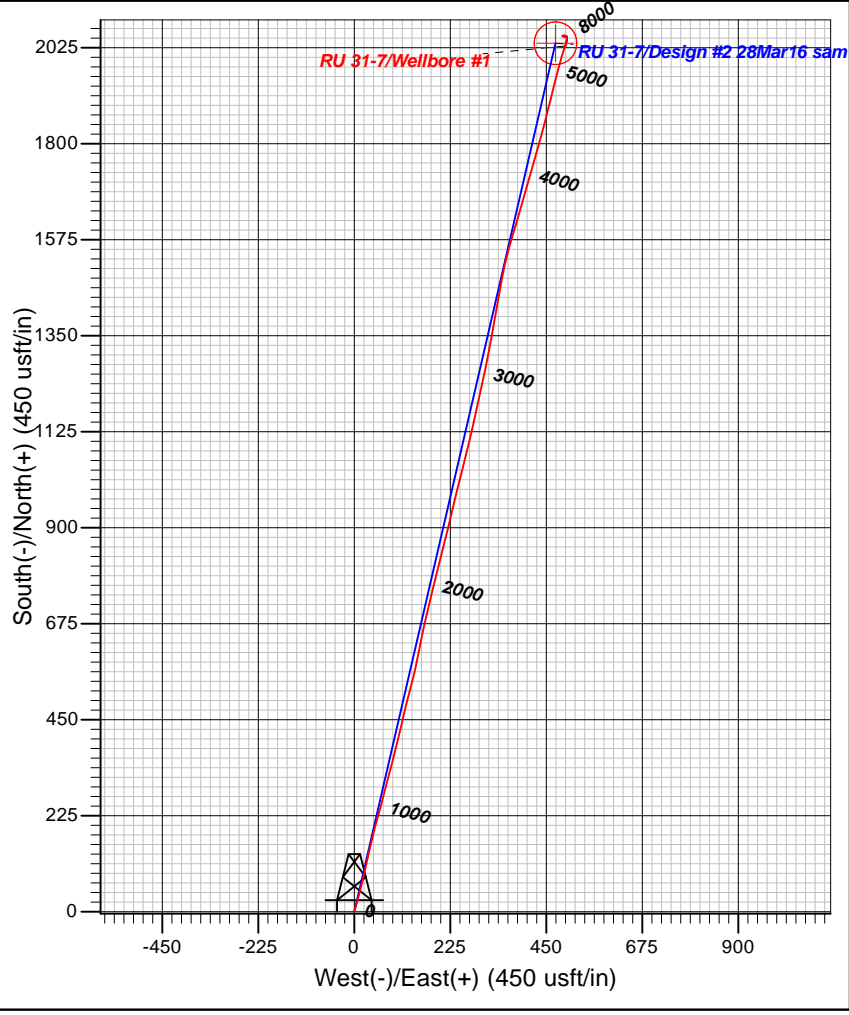
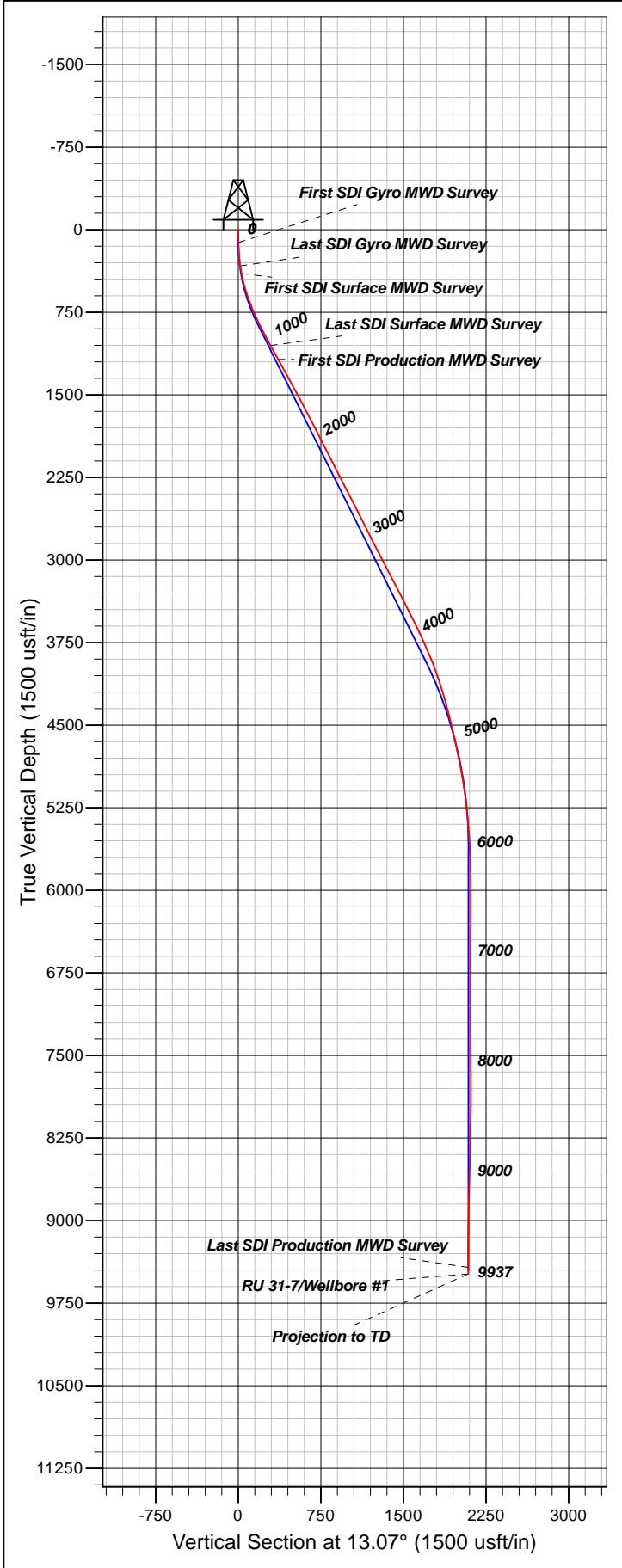
Signature

6-Oct-16

Date

Janie Collins

Colorado District Well Planner
Scientific Drilling International



Well Details: RU 31-7	
TVD Reference: GL 7339' & RKB 24' @ 7363.00usft (H&P 318) & Grid Level: 7339.00 +N/-S +E/-W Northing Easting Latitude Longitude Slot 0.00 0.00 1599716.15 2345100.67 39.4570359 -107.8196564 RU 31-7 (A8)	
REFERENCE INFORMATION	
Co-ordinate (N/E) Reference: Well RU 31-7 - Slot RU 31-7 (A8), True North Vertical (TVD) Reference: GL 7339' & RKB 24' @ 7363.00usft (H&P 318) Section (VS) Reference: Slot - RU 31-7 (A8)(0.00N, 0.00E) Measured Depth Reference: GL 7339' & RKB 24' @ 7363.00usft (H&P 318) 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: Wellbore #1 14:51, October 06 2016 Created By: Janie Collins	

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well RU 31-7 - Slot RU 31-7 (A8)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 7339' & RKB 24' @ 7363.00usft (H&P 318)
Site:	RU 22-7 Pad	MD Reference:	GL 7339' & RKB 24' @ 7363.00usft (H&P 318)
Well:	RU 31-7	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	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	RU 22-7 Pad				
Site Position:		Northing:	1,599,673.59 usft	Latitude:	39.4569181
From:	Map	Easting:	2,345,086.00 usft	Longitude:	-107.8197045
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.46 °

Well	RU 31-7 - Slot RU 31-7 (A8)					
Well Position	+N/-S	0.00 usft	Northing:	1,599,716.14 usft	Latitude:	39.4570359
	+E/-W	0.00 usft	Easting:	2,345,100.67 usft	Longitude:	-107.8196564
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	7,339.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	9/26/2016	9.33	65.68	51,778

Design	Wellbore #1				
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	13.07	

Survey Program	Date	10/6/2016			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
115.00	330.00	Survey #1 - Gyro MWD Survey (Wellbore)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
400.00	1,108.00	Survey #2 - Surface MWD Survey (Wellbo	SDI MWD	SDI MWD - Standard ver 1.0.1	
1,251.00	9,937.00	Survey #3 - Production MWD Survey (Wel	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	0.00
115.00	1.06	13.89	114.99	1.03	0.26	1.06	0.92	0.92	0.00	
First SDI Gyro MWD Survey										
149.00	1.76	21.45	148.98	1.82	0.52	1.89	2.13	2.06	22.24	
239.00	4.49	13.45	238.84	6.54	1.85	6.79	3.06	3.03	-8.89	
330.00	8.27	16.61	329.26	16.28	4.55	16.88	4.17	4.15	3.47	
Last SDI Gyro MWD Survey										
400.00	10.92	16.03	398.28	27.48	7.82	28.53	3.79	3.79	-0.83	

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well RU 31-7 - Slot RU 31-7 (A8)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 7339' & RKB 24' @ 7363.00usft (H&P 318)
Site:	RU 22-7 Pad	MD Reference:	GL 7339' & RKB 24' @ 7363.00usft (H&P 318)
Well:	RU 31-7	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	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)
First SDI Surface MWD Survey									
491.00	14.06	15.28	487.11	46.43	13.11	48.19	3.46	3.45	-0.82
581.00	17.62	13.65	573.68	70.22	19.21	72.74	3.99	3.96	-1.81
672.00	20.95	12.77	659.56	99.48	26.06	102.79	3.67	3.66	-0.97
763.00	23.59	11.76	743.77	133.18	33.37	137.27	2.93	2.90	-1.11
854.00	25.47	13.22	826.55	170.05	41.55	175.05	2.17	2.07	1.60
946.00	27.70	15.46	908.82	209.93	51.78	216.20	2.66	2.42	2.43
1,036.00	28.31	15.34	988.28	250.67	63.00	258.42	0.68	0.68	-0.13
1,108.00	28.31	14.77	1,051.67	283.64	71.87	292.55	0.38	0.00	-0.79
Last SDI Surface MWD Survey									
1,251.00	28.72	14.36	1,177.32	349.71	89.04	360.79	0.32	0.29	-0.29
First SDI Production MWD Survey									
1,345.00	28.85	13.83	1,259.71	393.61	100.06	406.04	0.30	0.14	-0.56
1,440.00	28.73	13.19	1,342.97	438.10	110.75	451.79	0.35	-0.13	-0.67
1,534.00	28.57	13.98	1,425.46	481.91	121.33	496.86	0.44	-0.17	0.84
1,629.00	28.31	14.82	1,508.99	525.73	132.58	542.09	0.50	-0.27	0.88
1,723.00	28.59	12.23	1,591.64	569.26	143.05	586.86	1.35	0.30	-2.76
1,818.00	27.75	11.47	1,675.39	613.15	152.26	631.70	0.96	-0.88	-0.80
1,912.00	26.99	11.29	1,758.87	655.51	160.79	674.89	0.81	-0.81	-0.19
2,006.00	27.31	13.80	1,842.51	697.37	170.11	717.78	1.27	0.34	2.67
2,101.00	26.86	13.54	1,927.09	739.40	180.33	761.03	0.49	-0.47	-0.27
2,195.00	26.19	13.77	2,011.20	780.20	190.24	803.01	0.72	-0.71	0.24
2,289.00	27.96	14.25	2,094.89	821.70	200.60	845.78	1.90	1.88	0.51
2,384.00	27.56	14.18	2,178.96	864.60	211.47	890.02	0.42	-0.42	-0.07
2,478.00	27.02	13.37	2,262.50	906.45	221.73	933.12	0.70	-0.57	-0.86
2,573.00	26.12	13.26	2,347.46	947.80	231.52	975.61	0.95	-0.95	-0.12
2,667.00	27.42	14.12	2,431.39	988.94	241.55	1,017.94	1.44	1.38	0.91
2,761.00	27.39	14.07	2,514.84	1,030.90	252.08	1,061.20	0.04	-0.03	-0.05
2,856.00	26.91	13.93	2,599.37	1,072.96	262.57	1,104.54	0.51	-0.51	-0.15
2,950.00	26.17	13.26	2,683.46	1,113.79	272.45	1,146.54	0.85	-0.79	-0.71
3,044.00	27.46	12.64	2,767.35	1,155.11	281.94	1,188.95	1.40	1.37	-0.66
3,139.00	27.37	12.28	2,851.69	1,197.82	291.38	1,232.68	0.20	-0.09	-0.38
3,233.00	26.88	11.83	2,935.35	1,239.73	300.33	1,275.54	0.57	-0.52	-0.48
3,328.00	26.51	11.85	3,020.22	1,281.50	309.09	1,318.20	0.39	-0.39	0.02
3,422.00	27.75	10.91	3,103.88	1,323.53	317.54	1,361.05	1.40	1.32	-1.00
3,516.00	27.95	10.18	3,186.99	1,366.70	325.58	1,404.92	0.42	0.21	-0.78
3,611.00	27.45	9.00	3,271.10	1,410.24	332.94	1,448.99	0.78	-0.53	-1.24
3,705.00	27.12	11.14	3,354.65	1,452.66	340.47	1,492.02	1.10	-0.35	2.28
3,800.00	26.90	10.82	3,439.28	1,495.01	348.68	1,535.13	0.28	-0.23	-0.34
3,894.00	27.26	14.14	3,522.98	1,536.78	357.94	1,577.91	1.65	0.38	3.53
3,988.00	25.63	16.46	3,607.15	1,577.15	368.96	1,619.73	2.05	-1.73	2.47
4,082.00	24.51	16.30	3,692.29	1,615.36	380.19	1,659.49	1.19	-1.19	-0.17
4,176.00	23.77	16.40	3,778.07	1,652.25	391.01	1,697.87	0.79	-0.79	0.11
4,271.00	22.98	16.28	3,865.27	1,688.42	401.61	1,735.50	0.83	-0.83	-0.13

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well RU 31-7 - Slot RU 31-7 (A8)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 7339' & RKB 24' @ 7363.00usft (H&P 318)
Site:	RU 22-7 Pad	MD Reference:	GL 7339' & RKB 24' @ 7363.00usft (H&P 318)
Well:	RU 31-7	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	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)	
4,365.00	20.53	15.85	3,952.57	1,721.90	411.26	1,770.29	2.61	-2.61	-0.46	
4,460.00	19.65	15.33	4,041.79	1,753.33	420.03	1,802.89	0.95	-0.93	-0.55	
4,554.00	17.90	15.54	4,130.78	1,782.49	428.08	1,833.12	1.86	-1.86	0.22	
4,648.00	16.37	15.82	4,220.61	1,809.15	435.57	1,860.78	1.63	-1.63	0.30	
4,742.00	15.41	15.28	4,311.02	1,833.94	442.47	1,886.50	1.03	-1.02	-0.57	
4,837.00	14.46	14.35	4,402.81	1,857.61	448.73	1,910.97	1.03	-1.00	-0.98	
4,931.00	13.37	14.47	4,494.05	1,879.51	454.36	1,933.57	1.16	-1.16	0.13	
5,025.00	12.88	14.10	4,585.59	1,900.19	459.63	1,954.91	0.53	-0.52	-0.39	
5,120.00	12.29	13.93	4,678.31	1,920.27	464.64	1,975.60	0.62	-0.62	-0.18	
5,214.00	11.86	12.31	4,770.23	1,939.42	469.11	1,995.26	0.58	-0.46	-1.72	
5,308.00	10.59	15.93	4,862.43	1,957.17	473.54	2,013.55	1.54	-1.35	3.85	
5,402.00	9.94	15.07	4,954.92	1,973.31	478.02	2,030.29	0.71	-0.69	-0.91	
5,497.00	9.40	14.52	5,048.57	1,988.73	482.10	2,046.24	0.58	-0.57	-0.58	
5,591.00	7.35	16.65	5,141.57	2,001.93	485.74	2,059.91	2.21	-2.18	2.27	
5,685.00	6.91	17.39	5,234.84	2,013.08	489.16	2,071.55	0.48	-0.47	0.79	
5,780.00	5.93	19.94	5,329.24	2,023.15	492.54	2,082.12	1.07	-1.03	2.68	
5,874.00	3.64	14.97	5,422.91	2,030.60	494.97	2,089.93	2.47	-2.44	-5.29	
5,969.00	3.63	15.79	5,517.72	2,036.41	496.56	2,095.94	0.06	-0.01	0.86	
6,063.00	3.46	8.45	5,611.54	2,042.07	497.79	2,101.74	0.52	-0.18	-7.81	
6,158.00	1.71	5.16	5,706.44	2,046.32	498.34	2,106.01	1.85	-1.84	-3.46	
6,252.00	1.41	2.82	5,800.40	2,048.87	498.52	2,108.53	0.33	-0.32	-2.49	
6,346.00	1.07	23.85	5,894.38	2,050.83	498.93	2,110.53	0.60	-0.36	22.37	
6,441.00	0.36	163.47	5,989.38	2,051.36	499.38	2,111.14	1.44	-0.75	146.97	
6,535.00	0.51	212.87	6,083.37	2,050.72	499.23	2,110.49	0.41	0.16	52.55	
6,629.00	0.33	279.28	6,177.37	2,050.42	498.74	2,110.08	0.51	-0.19	70.65	
6,724.00	0.71	270.84	6,272.37	2,050.47	497.88	2,109.94	0.41	0.40	-8.88	
6,818.00	0.81	277.92	6,366.36	2,050.57	496.64	2,109.76	0.15	0.11	7.53	
6,912.00	0.88	261.04	6,460.35	2,050.55	495.27	2,109.43	0.27	0.07	-17.96	
7,008.00	1.25	245.18	6,556.33	2,049.99	493.59	2,108.51	0.49	0.39	-16.52	
7,103.00	0.27	56.64	6,651.33	2,049.68	492.84	2,108.03	1.60	-1.03	180.48	
7,198.00	0.23	351.23	6,746.33	2,049.99	492.99	2,108.37	0.29	-0.04	-68.85	
7,293.00	0.46	328.99	6,841.32	2,050.51	492.77	2,108.82	0.28	0.24	-23.41	
7,387.00	0.69	287.80	6,935.32	2,051.00	492.04	2,109.14	0.49	0.24	-43.82	
7,481.00	0.64	292.20	7,029.31	2,051.38	491.01	2,109.27	0.08	-0.05	4.68	
7,576.00	0.55	290.36	7,124.31	2,051.73	490.09	2,109.41	0.10	-0.09	-1.94	
7,670.00	1.20	254.31	7,218.30	2,051.63	488.72	2,109.00	0.87	0.69	-38.35	
7,765.00	0.23	356.12	7,313.29	2,051.55	487.75	2,108.70	1.33	-1.02	107.17	
7,859.00	0.32	7.59	7,407.29	2,052.00	487.77	2,109.14	0.11	0.10	12.20	
7,954.00	0.12	211.49	7,502.29	2,052.17	487.76	2,109.31	0.46	-0.21	-164.32	
8,048.00	1.48	60.68	7,596.28	2,052.68	488.76	2,110.04	1.69	1.45	-160.44	
8,142.00	1.24	69.87	7,690.25	2,053.63	490.78	2,111.41	0.34	-0.26	9.78	
8,237.00	1.34	106.57	7,785.23	2,053.67	492.81	2,111.91	0.86	0.11	38.63	
8,331.00	0.98	118.73	7,879.21	2,052.97	494.56	2,111.62	0.46	-0.38	12.94	

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8,426.00	0.92	139.20	7,974.20	2,052.00	495.78	2,110.95	0.36	-0.06	21.55	
8,520.00	1.23	153.47	8,068.18	2,050.52	496.72	2,109.73	0.43	-0.33	15.18	
8,614.00	0.88	155.56	8,162.17	2,048.96	497.47	2,108.38	0.37	-0.37	2.22	
8,709.00	1.22	171.87	8,257.15	2,047.30	497.91	2,106.86	0.47	0.36	17.17	
8,803.00	1.40	177.77	8,351.13	2,045.16	498.10	2,104.82	0.24	0.19	6.28	
8,897.00	1.41	173.97	8,445.10	2,042.86	498.27	2,102.62	0.10	0.01	-4.04	
8,992.00	1.58	192.67	8,540.07	2,040.42	498.10	2,100.21	0.54	0.18	19.68	
9,086.00	1.32	199.52	8,634.04	2,038.14	497.46	2,097.83	0.33	-0.28	7.29	
9,180.00	1.27	187.26	8,728.01	2,036.08	496.96	2,095.72	0.30	-0.05	-13.04	
9,274.00	1.67	177.20	8,821.98	2,033.68	496.90	2,093.37	0.50	0.43	-10.70	
9,369.00	1.52	200.93	8,916.94	2,031.12	496.51	2,090.79	0.71	-0.16	24.98	
9,463.00	0.85	204.12	9,010.92	2,029.32	495.78	2,088.87	0.72	-0.71	3.39	
9,558.00	0.75	219.60	9,105.91	2,028.20	495.10	2,087.62	0.25	-0.11	16.29	
9,652.00	0.30	217.35	9,199.91	2,027.53	494.56	2,086.85	0.48	-0.48	-2.39	
9,747.00	0.29	281.20	9,294.91	2,027.38	494.17	2,086.61	0.33	-0.01	67.21	
9,841.00	0.87	309.30	9,388.90	2,027.88	493.39	2,086.92	0.67	0.62	29.89	
9,877.00	0.88	306.84	9,424.90	2,028.22	492.95	2,087.15	0.11	0.03	-6.83	
Last SDI Production MWD Survey										
9,937.00	0.88	306.84	9,484.89	2,028.77	492.22	2,087.52	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)		
115.00	114.99	1.03	0.26	First SDI Gyro MWD Survey	
330.00	329.26	16.28	4.55	Last SDI Gyro MWD Survey	
400.00	398.28	27.48	7.82	First SDI Surface MWD Survey	
1,108.00	1,051.67	283.64	71.87	Last SDI Surface MWD Survey	
1,251.00	1,177.32	349.71	89.04	First SDI Production MWD Survey	
9,877.00	9,424.90	2,028.22	492.95	Last SDI Production MWD Survey	
9,937.00	9,484.89	2,028.77	492.22	Projection to TD	

Checked By: _____ Approved By: _____ Date: _____