



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 311-7
County & State	Garfield, CO
SDI Job No.	421016DEFK389718
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 80 feet to a measured depth of 9,798 feet is true and correct as determined from all available records.

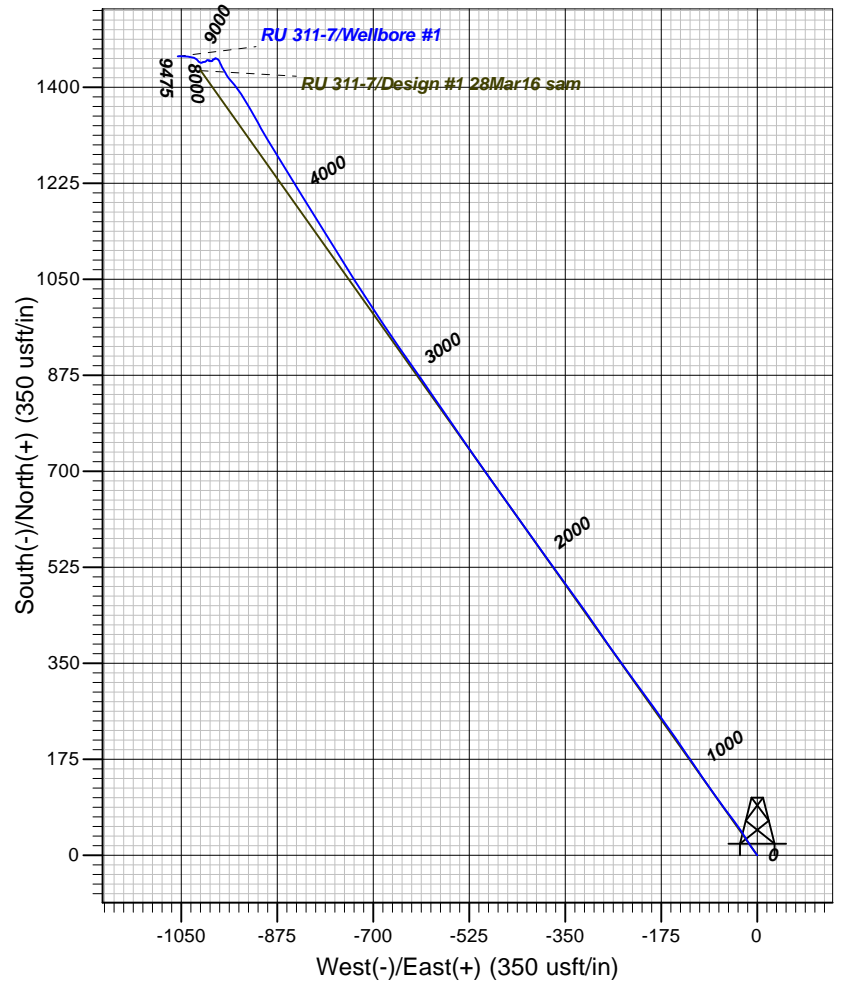
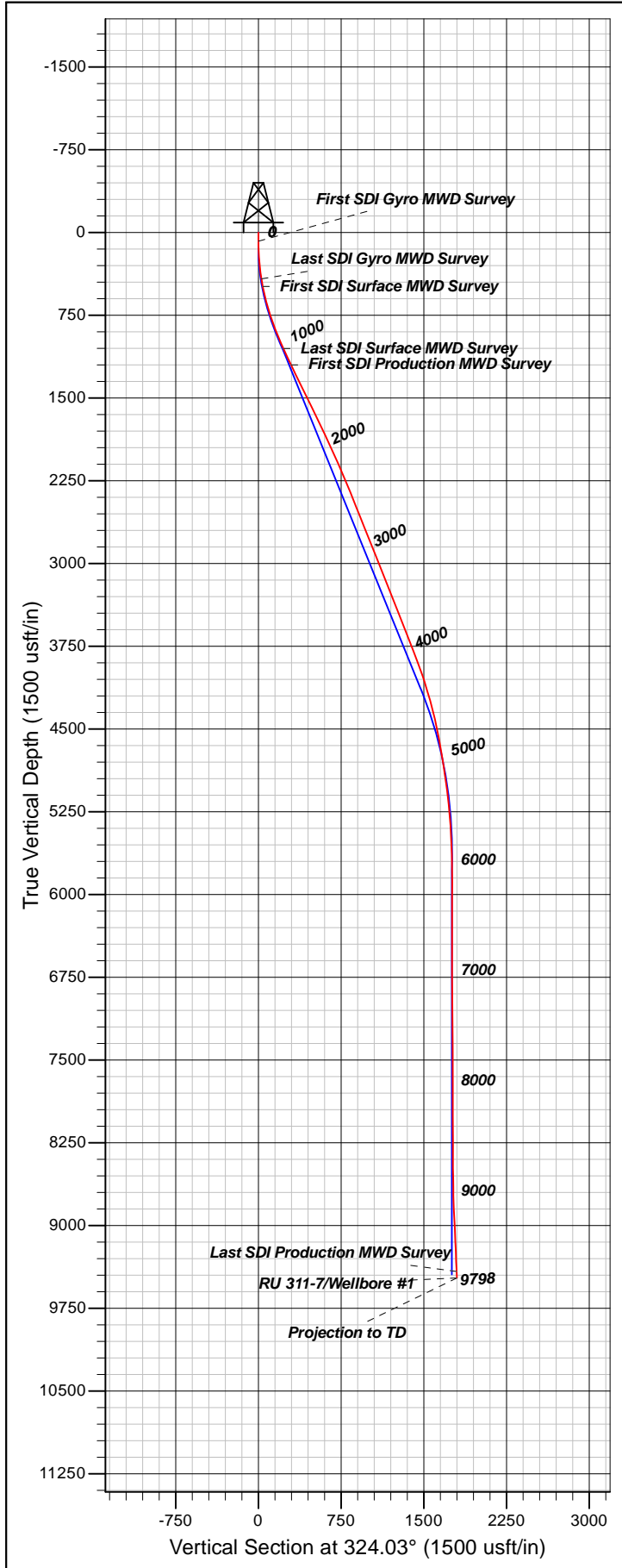


Signature

17-Oct-16

Date

Janie Collins
Colorado District Well Planner
Scientific Drilling International



Well Details: RU 311-7

TVD Reference: GL 7339' & RKB 24' @ 7363.00usft (H&P 318) Level: 7339.00
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.00 0.00 1599712.33 2345088.76 39.4570245 -107.8196982 RU 311-7 (B7)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well RU 311-7 - Slot RU 311-7 (B7), True North
 Vertical (TVD) Reference: GL 7339' & RKB 24' @ 7363.00usft (H&P 318)
 Section (VS) Reference: Slot - RU 311-7 (B7)(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

14:04, October 17 2016
 Created By: Janie Collins

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well RU 311-7 - Slot RU 311-7 (B7)
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 311-7	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 311-7 - Slot RU 311-7 (B7)					
Well Position	+N/-S	0.00 usft	Northing:	1,599,712.32 usft	Latitude:	39.4570246
	+E/-W	0.00 usft	Easting:	2,345,088.76 usft	Longitude:	-107.8196982
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	10/8/2016	9.33	65.68	51,774

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	324.03	

Survey Program	Date	10/17/2016			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
80.00	421.00	Survey #1 - Gyro MWD Survey (Wellbore)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
491.00	1,086.00	Survey #2 - Surface MWD Survey (Wellbo)	SDI MWD	SDI MWD - Standard ver 1.0.1	
1,250.00	9,798.00	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	
80.00	0.18	302.08	80.00	0.07	-0.11	0.12	0.23	0.23	0.00	
First SDI Gyro MWD Survey										
149.00	1.32	315.62	148.99	0.69	-0.75	1.00	1.66	1.65	19.62	
239.00	4.40	324.14	238.87	4.23	-3.50	5.48	3.45	3.42	9.47	
330.00	6.69	324.23	329.44	11.36	-8.65	14.27	2.52	2.52	0.10	
421.00	8.80	327.57	419.60	21.54	-15.48	26.52	2.37	2.32	3.67	
Last SDI Gyro MWD Survey										

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well RU 311-7 - Slot RU 311-7 (B7)
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 311-7	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)	
491.00	10.96	329.00	488.56	31.76	-21.78	38.50	3.11	3.09	2.04	
First SDI Surface MWD Survey										
581.00	13.28	325.42	576.55	47.61	-32.05	57.36	2.71	2.58	-3.98	
672.00	15.66	322.72	664.66	65.99	-45.43	80.09	2.72	2.62	-2.97	
763.00	18.38	323.45	751.67	87.29	-61.41	106.72	3.00	2.99	0.80	
854.00	20.60	324.83	837.45	111.91	-79.18	137.08	2.49	2.44	1.52	
946.00	22.29	325.25	923.07	139.48	-98.45	170.71	1.84	1.84	0.46	
1,036.00	23.48	325.96	1,005.99	168.36	-118.21	205.69	1.36	1.32	0.79	
1,086.00	24.01	325.91	1,051.76	185.04	-129.49	225.81	1.06	1.06	-0.10	
Last SDI Surface MWD Survey										
1,250.00	25.68	324.34	1,200.57	241.55	-168.91	294.70	1.09	1.02	-0.96	
First SDI Production MWD Survey										
1,345.00	26.33	324.19	1,285.95	275.36	-193.24	336.35	0.69	0.68	-0.16	
1,439.00	26.28	323.69	1,370.22	309.03	-217.76	378.01	0.24	-0.05	-0.53	
1,534.00	26.76	323.50	1,455.22	343.17	-242.93	420.43	0.51	0.51	-0.20	
1,629.00	26.11	325.75	1,540.29	377.64	-267.42	462.71	1.26	-0.68	2.37	
1,723.00	25.48	324.92	1,624.93	411.29	-290.68	503.60	0.77	-0.67	-0.88	
1,817.00	25.29	324.77	1,709.85	444.23	-313.89	543.89	0.21	-0.20	-0.16	
1,911.00	25.38	324.69	1,794.81	477.07	-337.11	584.11	0.10	0.10	-0.09	
2,005.00	24.83	323.87	1,879.93	509.45	-360.39	624.00	0.69	-0.59	-0.87	
2,100.00	25.24	324.13	1,966.00	541.98	-384.02	664.20	0.45	0.43	0.27	
2,194.00	23.84	324.36	2,051.51	573.66	-406.84	703.24	1.49	-1.49	0.24	
2,288.00	23.56	324.17	2,137.58	604.33	-428.90	741.02	0.31	-0.30	-0.20	
2,382.00	23.39	324.49	2,223.80	634.75	-450.74	778.46	0.23	-0.18	0.34	
2,477.00	22.07	324.87	2,311.42	664.70	-471.96	815.17	1.40	-1.39	0.40	
2,571.00	22.01	325.52	2,398.55	693.66	-492.10	850.43	0.27	-0.06	0.69	
2,665.00	21.34	324.55	2,485.91	722.11	-511.99	885.14	0.81	-0.71	-1.03	
2,760.00	21.74	325.52	2,574.27	750.70	-531.97	920.02	0.56	0.42	1.02	
2,854.00	21.27	325.56	2,661.73	779.11	-551.47	954.46	0.50	-0.50	0.04	
2,949.00	22.24	325.24	2,749.96	808.09	-571.47	989.66	1.03	1.02	-0.34	
3,043.00	22.37	325.34	2,836.93	837.42	-591.78	1,025.33	0.14	0.14	0.11	
3,137.00	22.23	325.47	2,923.90	866.78	-612.03	1,060.99	0.16	-0.15	0.14	
3,232.00	22.13	325.21	3,011.87	896.28	-632.43	1,096.84	0.15	-0.11	-0.27	
3,326.00	21.06	324.23	3,099.27	924.52	-652.40	1,131.44	1.20	-1.14	-1.04	
3,421.00	22.08	326.19	3,187.62	953.21	-672.32	1,166.35	1.31	1.07	2.06	
3,515.00	20.80	326.40	3,275.11	981.79	-691.39	1,200.68	1.36	-1.36	0.22	
3,609.00	21.58	328.09	3,362.75	1,010.37	-709.76	1,234.60	1.05	0.83	1.80	
3,703.00	22.11	327.43	3,450.00	1,039.95	-728.42	1,269.50	0.62	0.56	-0.70	
3,798.00	21.89	327.05	3,538.09	1,069.88	-747.68	1,305.04	0.28	-0.23	-0.40	
3,892.00	21.58	327.96	3,625.40	1,099.24	-766.38	1,339.78	0.49	-0.33	0.97	
3,986.00	21.19	328.04	3,712.93	1,128.30	-784.54	1,373.97	0.42	-0.41	0.09	
4,081.00	20.75	328.11	3,801.64	1,157.16	-802.52	1,407.89	0.46	-0.46	0.07	
4,175.00	20.36	328.40	3,889.66	1,185.22	-819.89	1,440.80	0.43	-0.41	0.31	
4,269.00	19.77	328.72	3,977.95	1,212.74	-836.71	1,472.95	0.64	-0.63	0.34	

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well RU 311-7 - Slot RU 311-7 (B7)
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 311-7	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)	
4,364.00	17.81	328.24	4,067.88	1,238.83	-852.70	1,503.46	2.07	-2.06	-0.51	
4,458.00	17.36	329.27	4,157.49	1,263.10	-867.43	1,531.76	0.58	-0.48	1.10	
4,552.00	15.48	326.81	4,247.65	1,285.66	-881.47	1,558.26	2.13	-2.00	-2.62	
4,647.00	13.60	330.27	4,339.61	1,305.97	-893.95	1,582.02	2.18	-1.98	3.64	
4,741.00	13.18	330.36	4,431.05	1,324.88	-904.73	1,603.66	0.45	-0.45	0.10	
4,836.00	11.64	331.57	4,523.83	1,342.72	-914.65	1,623.93	1.64	-1.62	1.27	
4,930.00	10.34	330.01	4,616.10	1,358.37	-923.38	1,641.72	1.42	-1.38	-1.66	
5,024.00	9.61	328.48	4,708.68	1,372.36	-931.70	1,657.93	0.83	-0.78	-1.63	
5,119.00	9.50	328.49	4,802.37	1,385.81	-939.94	1,673.65	0.12	-0.12	0.01	
5,213.00	8.02	321.45	4,895.27	1,397.55	-948.08	1,687.94	1.94	-1.57	-7.49	
5,307.00	7.93	317.77	4,988.36	1,407.48	-956.53	1,700.94	0.55	-0.10	-3.91	
5,402.00	7.35	326.58	5,082.52	1,417.40	-964.28	1,713.52	1.37	-0.61	9.27	
5,496.00	5.16	328.96	5,175.95	1,426.05	-969.77	1,723.74	2.35	-2.33	2.53	
5,590.00	5.35	329.10	5,269.56	1,433.43	-974.20	1,732.32	0.20	0.20	0.15	
5,685.00	4.12	337.86	5,364.23	1,440.39	-977.76	1,740.04	1.50	-1.29	9.22	
5,779.00	3.13	335.39	5,458.05	1,445.85	-980.10	1,745.84	1.07	-1.05	-2.63	
5,874.00	2.70	316.49	5,552.92	1,449.83	-982.72	1,750.60	1.10	-0.45	-19.89	
5,968.00	1.99	294.34	5,646.85	1,452.11	-985.73	1,754.21	1.21	-0.76	-23.56	
6,062.00	0.56	284.09	5,740.82	1,452.89	-987.67	1,755.98	1.53	-1.52	-10.90	
6,157.00	0.79	232.31	5,835.82	1,452.61	-988.64	1,756.32	0.66	0.24	-54.51	
6,251.00	0.67	191.43	5,929.81	1,451.67	-989.26	1,755.93	0.56	-0.13	-43.49	
6,346.00	0.40	257.74	6,024.81	1,451.06	-989.69	1,755.68	0.66	-0.28	69.80	
6,440.00	0.44	264.39	6,118.80	1,450.95	-990.37	1,756.00	0.07	0.04	7.07	
6,534.00	0.58	263.48	6,212.80	1,450.86	-991.20	1,756.42	0.15	0.15	-0.97	
6,629.00	0.81	237.27	6,307.79	1,450.45	-992.25	1,756.69	0.41	0.24	-27.59	
6,723.00	0.44	208.14	6,401.79	1,449.77	-992.98	1,756.57	0.51	-0.39	-30.99	
6,817.00	0.67	180.00	6,495.78	1,448.90	-993.15	1,755.97	0.37	0.24	-29.94	
6,911.00	0.33	220.40	6,589.78	1,448.14	-993.32	1,755.46	0.50	-0.36	42.98	
7,006.00	0.79	255.95	6,684.77	1,447.78	-994.13	1,755.64	0.58	0.48	37.42	
7,100.00	0.81	249.58	6,778.77	1,447.39	-995.39	1,756.06	0.10	0.02	-6.78	
7,194.00	0.69	333.86	6,872.76	1,447.66	-996.26	1,756.79	1.07	-0.13	89.66	
7,289.00	0.76	261.75	6,967.75	1,448.09	-997.13	1,757.65	0.90	0.07	-75.91	
7,383.00	1.05	265.13	7,061.74	1,447.93	-998.61	1,758.39	0.31	0.31	3.60	
7,478.00	0.36	53.37	7,156.74	1,448.03	-999.24	1,758.84	1.44	-0.73	156.04	
7,572.00	0.62	350.77	7,250.73	1,448.71	-999.08	1,759.30	0.59	0.28	-66.60	
7,667.00	0.29	294.24	7,345.73	1,449.31	-999.38	1,759.96	0.55	-0.35	-59.51	
7,761.00	0.88	266.94	7,439.73	1,449.37	-1,000.32	1,760.56	0.68	0.63	-29.04	
7,855.00	1.19	289.43	7,533.71	1,449.66	-1,001.96	1,761.76	0.54	0.33	23.93	
7,949.00	0.83	214.28	7,627.70	1,449.42	-1,003.26	1,762.33	1.35	-0.38	-79.95	
8,044.00	1.07	219.96	7,722.69	1,448.17	-1,004.22	1,761.88	0.27	0.25	5.98	
8,138.00	1.07	235.50	7,816.67	1,447.00	-1,005.51	1,761.69	0.31	0.00	16.53	
8,232.00	0.34	271.55	7,910.66	1,446.51	-1,006.51	1,761.89	0.87	-0.78	38.35	
8,327.00	1.12	263.94	8,005.65	1,446.42	-1,007.72	1,762.52	0.83	0.82	-8.01	

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Site:	RU 22-7 Pad	MD Reference:	GL 7339' & RKB 24' @ 7363.00usft (H&P 318)
Well:	RU 311-7	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)	
8,421.00	0.50	234.12	8,099.65	1,446.09	-1,008.96	1,762.98	0.78	-0.66	-31.72	
8,516.00	0.45	276.86	8,194.64	1,445.89	-1,009.67	1,763.23	0.37	-0.05	44.99	
8,610.00	0.62	267.46	8,288.64	1,445.91	-1,010.54	1,763.76	0.20	0.18	-10.00	
8,704.00	1.09	228.04	8,382.63	1,445.29	-1,011.72	1,763.95	0.77	0.50	-41.94	
8,799.00	0.69	262.52	8,477.62	1,444.61	-1,012.96	1,764.13	0.69	-0.42	36.29	
8,893.00	0.70	283.99	8,571.61	1,444.67	-1,014.07	1,764.84	0.28	0.01	22.84	
8,988.00	1.09	283.53	8,666.60	1,445.03	-1,015.52	1,765.97	0.41	0.41	-0.48	
9,082.00	1.58	301.30	8,760.57	1,445.91	-1,017.49	1,767.85	0.68	0.52	18.90	
9,176.00	2.71	322.91	8,854.51	1,448.35	-1,019.94	1,771.26	1.46	1.20	22.99	
9,271.00	3.44	304.97	8,949.37	1,451.78	-1,023.63	1,776.20	1.26	0.77	-18.88	
9,365.00	3.22	286.55	9,043.22	1,454.15	-1,028.47	1,780.96	1.16	-0.23	-19.60	
9,460.00	3.31	278.95	9,138.06	1,455.34	-1,033.74	1,785.02	0.47	0.09	-8.00	
9,554.00	3.36	272.08	9,231.90	1,455.86	-1,039.17	1,788.63	0.43	0.05	-7.31	
9,648.00	4.42	274.51	9,325.69	1,456.24	-1,045.54	1,792.68	1.14	1.13	2.59	
9,739.00	4.31	268.52	9,416.42	1,456.43	-1,052.45	1,796.89	0.52	-0.12	-6.58	
Last SDI Production MWD Survey										
9,798.00	4.31	268.52	9,475.26	1,456.31	-1,056.88	1,799.40	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	
80.00	80.00	0.07	-0.11	First SDI Gyro MWD Survey	
421.00	419.60	21.54	-15.48	Last SDI Gyro MWD Survey	
491.00	488.56	31.76	-21.78	First SDI Surface MWD Survey	
1,086.00	1,051.76	185.04	-129.49	Last SDI Surface MWD Survey	
1,250.00	1,200.57	241.55	-168.91	First SDI Production MWD Survey	
9,739.00	9,416.42	1,456.43	-1,052.45	Last SDI Production MWD Survey	
9,798.00	9,475.26	1,456.31	-1,056.88	Projection to TD	

Checked By: _____ Approved By: _____ Date: _____