



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.	SR 444-12
County & State	Garfield, CO
SDI Job No.	421116DEFK397935
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 111 feet to a measured depth of 9,754 feet is true and correct as determined from all available records.

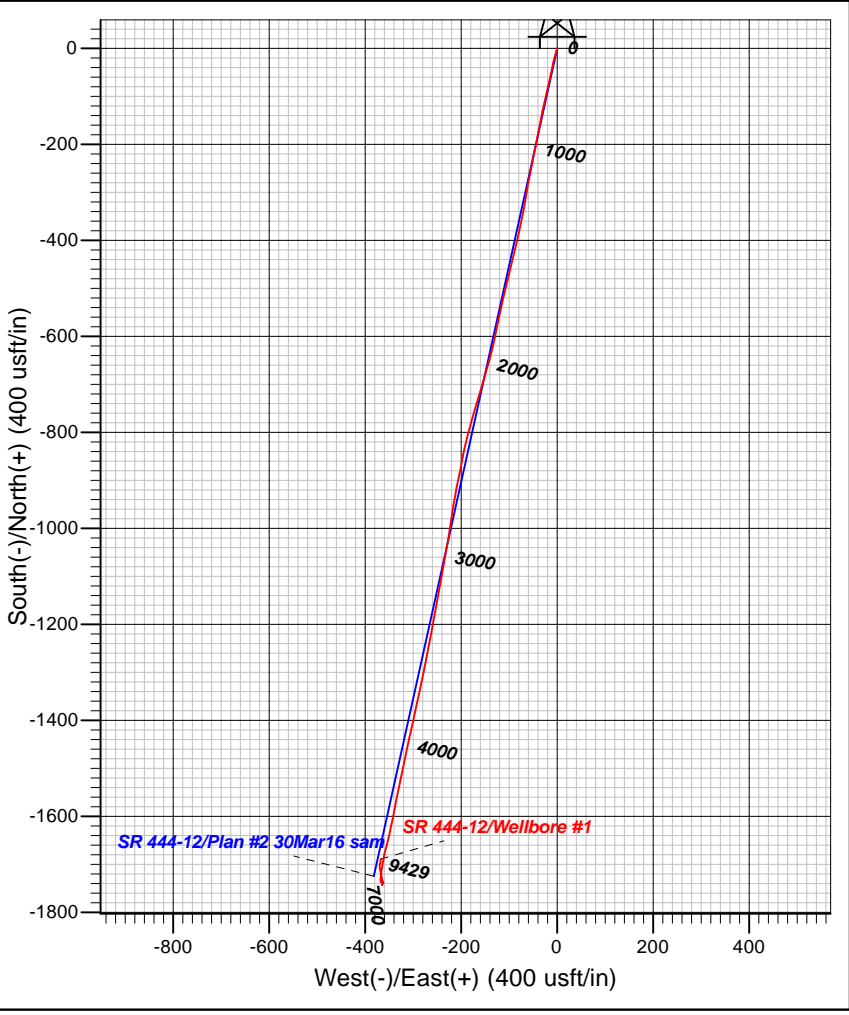
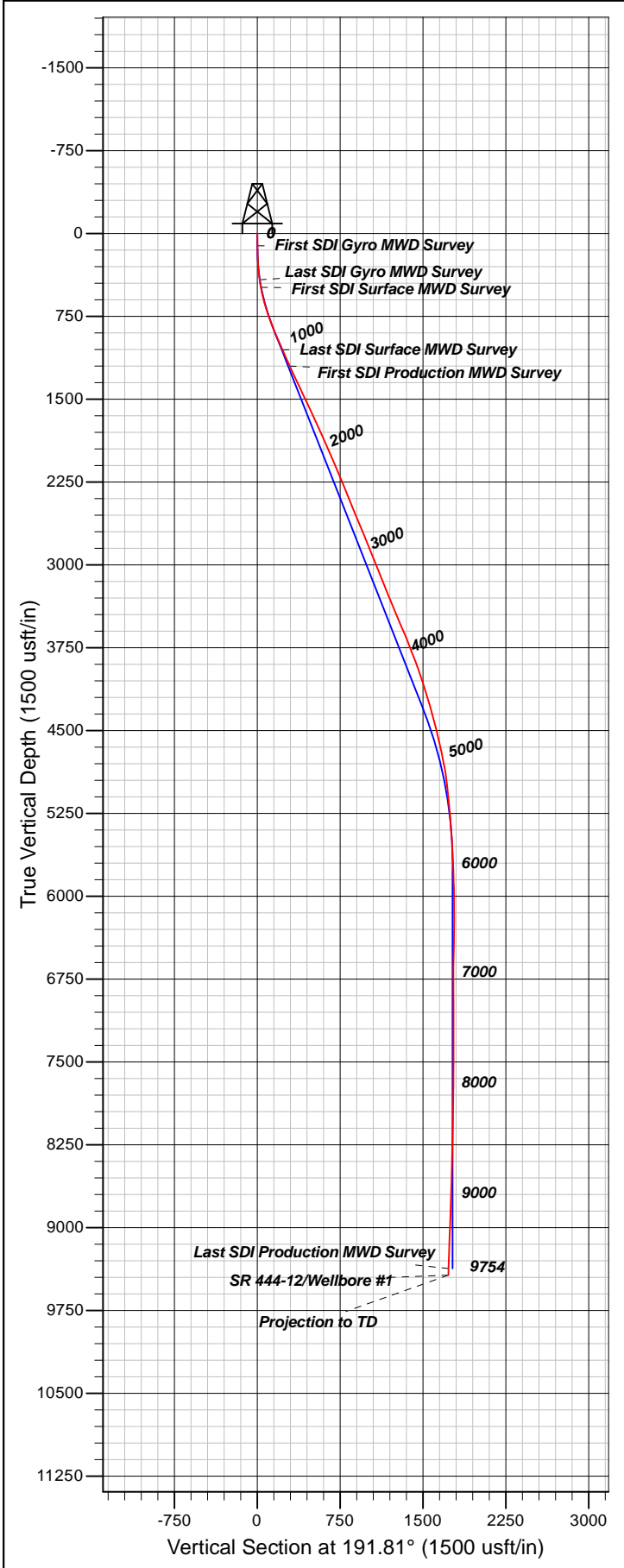
Signature

18-Nov-16

Date

Janie Collins

Colorado District Well Planner
Scientific Drilling International



Well Details: SR 444-12

TVD Reference: GL 7357' & RKB 24' @ 7381.00usft (H&P 318) Grid Level: 7357.00					
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	1597961.99	2343310.50	39.4520958	-107.8258353SR 444-12 (B2)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well SR 444-12 - Slot SR 444-12 (B2), True North
 Vertical (TVD) Reference: GL 7357' & RKB 24' @ 7381.00usft (H&P 318)
 Section (VS) Reference: Slot - SR 444-12 (B2)(0.00N, 0.00E)
 Measured Depth Reference: GL 7357' & RKB 24' @ 7381.00usft (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

12:41, November 18 2016
 Created By: Janie Collins

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well SR 444-12 - Slot SR 444-12 (B2)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 7357' & RKB 24' @ 7381.00usft (H&P 318)
Site:	SR 43-12 Pad	MD Reference:	GL 7357' & RKB 24' @ 7381.00usft (H&P 318)
Well:	SR 444-12	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	SR 43-12 Pad				
Site Position:		Northing:	1,598,022.09 usft	Latitude:	39.4522607
From:	Map	Easting:	2,343,309.20 usft	Longitude:	-107.8258454
Position Uncertainty:	0.00 usft	Slot Radius:	0.00 in	Grid Convergence:	-1.47 °

Well	SR 444-12 - Slot SR 444-12 (B2)					
Well Position	+N/-S	0.00 usft	Northing:	1,597,961.99 usft	Latitude:	39.4520958
	+E/-W	0.00 usft	Easting:	2,343,310.50 usft	Longitude:	-107.8258354
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	7,357.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	11/10/2016	9.32	65.67	51,764

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	191.81	

Survey Program	Date	11/18/2016			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
111.00	419.00	Survey #1 - Gyro MWD Survey (Wellbore)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
488.00	1,089.00	Survey #2 - Surface MWD Survey (Wellbo	SDI MWD	SDI MWD - Standard ver 1.0.1	
1,249.00	9,754.00	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
111.00	0.35	201.97	111.00	-0.31	-0.13	0.33	0.32	0.32	0.00	0.00
First SDI Gyro MWD Survey										
146.00	0.70	200.30	146.00	-0.61	-0.24	0.65	1.00	1.00	-4.77	
236.00	2.99	189.40	235.95	-3.45	-0.82	3.54	2.56	2.54	-12.11	
328.00	4.93	198.72	327.72	-9.56	-2.48	9.86	2.21	2.11	10.13	
419.00	8.09	196.44	418.12	-19.40	-5.54	20.13	3.48	3.47	-2.51	
Last SDI Gyro MWD Survey										

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well SR 444-12 - Slot SR 444-12 (B2)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 7357' & RKB 24' @ 7381.00usft (H&P 318)
Site:	SR 43-12 Pad	MD Reference:	GL 7357' & RKB 24' @ 7381.00usft (H&P 318)
Well:	SR 444-12	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)	
488.00	10.69	191.48	486.19	-30.34	-8.19	31.37	3.94	3.77	-7.19	
First SDI Surface MWD Survey										
578.00	13.53	191.92	574.18	-48.82	-12.03	50.25	3.16	3.16	0.49	
669.00	16.43	193.50	662.08	-71.75	-17.23	73.76	3.22	3.19	1.74	
759.00	19.52	192.79	747.68	-98.80	-23.53	101.53	3.44	3.43	-0.79	
850.00	22.13	191.47	832.73	-130.43	-30.31	133.87	2.91	2.87	-1.45	
941.00	22.89	191.05	916.79	-164.60	-37.11	168.71	0.85	0.84	-0.46	
1,032.00	22.96	191.53	1,000.61	-199.36	-44.05	204.15	0.22	0.08	0.53	
1,089.00	23.13	191.78	1,053.06	-221.21	-48.56	226.47	0.34	0.30	0.44	
Last SDI Surface MWD Survey										
1,249.00	24.66	190.24	1,199.34	-284.83	-60.91	291.26	1.03	0.96	-0.96	
First SDI Production MWD Survey										
1,343.00	25.65	189.58	1,284.42	-324.19	-67.78	331.20	1.09	1.05	-0.70	
1,438.00	25.75	192.02	1,370.03	-364.65	-75.50	372.38	1.12	0.11	2.57	
1,532.00	24.60	193.48	1,455.10	-403.65	-84.31	412.36	1.39	-1.22	1.55	
1,626.00	25.76	193.27	1,540.17	-442.55	-93.56	452.33	1.24	1.23	-0.22	
1,721.00	24.39	194.20	1,626.21	-481.66	-103.11	492.57	1.50	-1.44	0.98	
1,815.00	24.37	193.11	1,711.83	-519.37	-112.27	531.35	0.48	-0.02	-1.16	
1,909.00	24.45	191.45	1,797.43	-557.32	-120.53	570.19	0.73	0.09	-1.77	
2,003.00	25.18	191.99	1,882.75	-595.95	-128.55	609.64	0.81	0.78	0.57	
2,097.00	23.88	193.91	1,968.26	-633.98	-137.28	648.66	1.62	-1.38	2.04	
2,191.00	22.30	196.63	2,054.73	-669.54	-146.96	685.45	2.03	-1.68	2.89	
2,285.00	22.47	195.69	2,141.65	-703.92	-156.92	721.14	0.42	0.18	-1.00	
2,380.00	22.81	197.37	2,229.33	-738.98	-167.33	757.58	0.77	0.36	1.77	
2,474.00	22.34	195.03	2,316.13	-773.62	-177.40	793.55	1.08	-0.50	-2.49	
2,569.00	22.43	195.60	2,403.97	-808.51	-186.96	829.66	0.25	0.09	0.60	
2,663.00	22.29	190.69	2,490.91	-843.31	-195.09	865.38	1.99	-0.15	-5.22	
2,757.00	22.66	191.39	2,577.77	-878.58	-201.97	901.31	0.49	0.39	0.74	
2,852.00	23.06	191.58	2,665.31	-914.74	-209.32	938.22	0.43	0.42	0.20	
2,946.00	21.69	189.02	2,752.23	-949.94	-215.74	973.98	1.79	-1.46	-2.72	
3,041.00	21.99	188.61	2,840.41	-984.86	-221.15	1,009.27	0.35	0.32	-0.43	
3,135.00	22.39	188.80	2,927.45	-1,019.95	-226.53	1,044.72	0.43	0.43	0.20	
3,230.00	22.35	190.51	3,015.30	-1,055.59	-232.59	1,080.85	0.69	-0.04	1.80	
3,324.00	22.19	190.53	3,102.29	-1,090.62	-239.09	1,116.46	0.17	-0.17	0.02	
3,418.00	21.78	189.52	3,189.46	-1,125.27	-245.22	1,151.64	0.59	-0.44	-1.07	
3,513.00	21.29	191.25	3,277.83	-1,159.57	-251.50	1,186.49	0.84	-0.52	1.82	
3,607.00	22.80	190.36	3,364.95	-1,194.22	-258.11	1,221.77	1.65	1.61	-0.95	
3,701.00	22.76	190.27	3,451.62	-1,230.03	-264.62	1,258.15	0.06	-0.04	-0.10	
3,795.00	23.21	190.80	3,538.16	-1,266.12	-271.33	1,294.85	0.53	0.48	0.56	
3,890.00	23.13	192.04	3,625.49	-1,302.75	-278.73	1,332.22	0.52	-0.08	1.31	
3,984.00	21.17	192.16	3,712.55	-1,337.41	-286.16	1,367.66	2.09	-2.09	0.13	
4,078.00	21.24	192.13	3,800.19	-1,370.64	-293.32	1,401.66	0.08	0.07	-0.03	
4,173.00	20.77	193.19	3,888.87	-1,403.87	-300.77	1,435.71	0.64	-0.49	1.12	
4,267.00	18.49	191.80	3,977.41	-1,434.69	-307.63	1,467.28	2.48	-2.43	-1.48	

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Site:	SR 43-12 Pad	MD Reference:	GL 7357' & RKB 24' @ 7381.00usft (H&P 318)
Well:	SR 444-12	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)	
4,361.00	17.98	191.89	4,066.69	-1,463.48	-313.66	1,496.70	0.54	-0.54	0.10	
4,456.00	17.83	192.81	4,157.08	-1,492.01	-319.91	1,525.90	0.34	-0.16	0.97	
4,550.00	16.03	190.43	4,247.01	-1,518.81	-325.45	1,553.27	2.05	-1.91	-2.53	
4,645.00	15.59	192.73	4,338.41	-1,544.16	-330.64	1,579.14	0.81	-0.46	2.42	
4,739.00	14.17	189.59	4,429.26	-1,567.83	-335.34	1,603.27	1.74	-1.51	-3.34	
4,833.00	13.66	192.03	4,520.50	-1,590.03	-339.57	1,625.87	0.83	-0.54	2.60	
4,928.00	13.94	192.86	4,612.76	-1,612.16	-344.45	1,648.53	0.36	0.29	0.87	
5,022.00	11.87	190.72	4,704.38	-1,632.70	-348.77	1,669.52	2.26	-2.20	-2.28	
5,117.00	9.99	192.58	4,797.66	-1,650.34	-352.39	1,687.53	2.01	-1.98	1.96	
5,211.00	8.70	198.70	4,890.41	-1,665.03	-356.44	1,702.74	1.73	-1.37	6.51	
5,305.00	6.97	190.98	4,983.53	-1,677.37	-359.81	1,715.50	2.15	-1.84	-8.21	
5,399.00	5.70	188.80	5,076.95	-1,687.58	-361.61	1,725.86	1.37	-1.35	-2.32	
5,493.00	5.01	190.81	5,170.54	-1,696.22	-363.09	1,734.63	0.76	-0.73	2.14	
5,588.00	4.66	188.31	5,265.21	-1,704.12	-364.43	1,742.63	0.43	-0.37	-2.63	
5,682.00	4.75	191.68	5,358.89	-1,711.71	-365.77	1,750.33	0.31	0.10	3.59	
5,776.00	3.83	176.70	5,452.63	-1,718.65	-366.37	1,757.26	1.53	-0.98	-15.94	
5,870.00	3.94	172.39	5,546.41	-1,724.99	-365.77	1,763.33	0.33	0.12	-4.59	
5,965.00	3.07	164.11	5,641.23	-1,730.67	-364.64	1,768.66	1.06	-0.92	-8.72	
6,059.00	1.81	174.67	5,735.15	-1,734.57	-363.81	1,772.31	1.42	-1.34	11.23	
6,153.00	2.37	175.52	5,829.08	-1,737.98	-363.52	1,775.60	0.60	0.60	0.90	
6,247.00	0.74	213.19	5,923.05	-1,740.43	-363.70	1,778.03	1.96	-1.73	40.07	
6,342.00	0.69	182.71	6,018.04	-1,741.52	-364.06	1,779.16	0.40	-0.05	-32.08	
6,436.00	0.71	196.01	6,112.03	-1,742.64	-364.25	1,780.30	0.17	0.02	14.15	
6,530.00	0.50	320.88	6,206.03	-1,742.88	-364.67	1,780.62	1.15	-0.22	132.84	
6,625.00	0.40	358.87	6,301.03	-1,742.23	-364.94	1,780.04	0.32	-0.11	39.99	
6,719.00	0.78	16.40	6,395.02	-1,741.29	-364.76	1,779.08	0.44	0.40	18.65	
6,814.00	1.62	34.68	6,490.00	-1,739.56	-363.82	1,777.20	0.96	0.88	19.24	
6,908.00	1.43	36.53	6,583.97	-1,737.53	-362.36	1,774.91	0.21	-0.20	1.97	
7,002.00	0.24	232.88	6,677.96	-1,736.70	-361.82	1,773.99	1.77	-1.27	-174.10	
7,097.00	0.08	111.48	6,772.96	-1,736.85	-361.92	1,774.15	0.31	-0.17	-127.79	
7,191.00	0.62	247.15	6,866.96	-1,737.07	-362.33	1,774.46	0.72	0.57	144.33	
7,286.00	0.53	266.37	6,961.95	-1,737.30	-363.24	1,774.86	0.22	-0.09	20.23	
7,380.00	0.63	255.23	7,055.95	-1,737.46	-364.17	1,775.21	0.16	0.11	-11.85	
7,474.00	0.45	280.50	7,149.94	-1,737.52	-365.04	1,775.45	0.31	-0.19	26.88	
7,568.00	0.24	267.30	7,243.94	-1,737.46	-365.59	1,775.51	0.24	-0.22	-14.04	
7,663.00	0.18	231.45	7,338.94	-1,737.57	-365.91	1,775.67	0.15	-0.06	-37.74	
7,757.00	0.45	317.70	7,432.94	-1,737.38	-366.27	1,775.57	0.50	0.29	91.76	
7,851.00	0.35	310.70	7,526.94	-1,736.92	-366.74	1,775.22	0.12	-0.11	-7.45	
7,946.00	0.81	353.02	7,621.93	-1,736.07	-367.04	1,774.44	0.63	0.48	44.55	
8,040.00	0.79	341.99	7,715.92	-1,734.79	-367.32	1,773.25	0.16	-0.02	-11.73	
8,135.00	1.00	341.35	7,810.91	-1,733.38	-367.79	1,771.97	0.22	0.22	-0.67	
8,229.00	0.81	354.97	7,904.90	-1,731.95	-368.11	1,770.62	0.30	-0.20	14.49	
8,324.00	0.69	348.98	7,999.89	-1,730.71	-368.28	1,769.45	0.15	-0.13	-6.31	

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Well:	SR 444-12	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)	
8,418.00	0.78	29.47	8,093.89	-1,729.60	-368.07	1,768.32	0.55	0.10	43.07	
8,512.00	0.87	26.07	8,187.88	-1,728.40	-367.44	1,767.02	0.11	0.10	-3.62	
8,606.00	1.04	5.58	8,281.86	-1,726.91	-367.05	1,765.48	0.40	0.18	-21.80	
8,701.00	1.65	1.21	8,376.84	-1,724.69	-366.94	1,763.28	0.65	0.64	-4.60	
8,795.00	1.58	0.44	8,470.80	-1,722.04	-366.90	1,760.68	0.08	-0.07	-0.82	
8,890.00	2.27	356.35	8,565.75	-1,718.85	-367.01	1,757.58	0.74	0.73	-4.31	
8,984.00	2.18	339.73	8,659.68	-1,715.32	-367.74	1,754.27	0.69	-0.10	-17.68	
9,078.00	2.09	346.71	8,753.61	-1,711.97	-368.76	1,751.20	0.29	-0.10	7.43	
9,173.00	2.02	351.83	8,848.55	-1,708.63	-369.39	1,748.06	0.21	-0.07	5.39	
9,267.00	1.85	359.68	8,942.50	-1,705.47	-369.64	1,745.02	0.33	-0.18	8.35	
9,361.00	2.00	359.53	9,036.44	-1,702.31	-369.66	1,741.94	0.16	0.16	-0.16	
9,456.00	2.21	15.56	9,131.38	-1,698.89	-369.18	1,738.49	0.66	0.22	16.87	
9,550.00	2.11	9.23	9,225.31	-1,695.44	-368.42	1,734.95	0.28	-0.11	-6.73	
9,645.00	1.91	2.54	9,320.25	-1,692.13	-368.07	1,731.64	0.32	-0.21	-7.04	
9,694.00	1.76	13.36	9,369.23	-1,690.58	-367.86	1,730.08	0.77	-0.31	22.08	
Last SDI Production MWD Survey										
9,754.00	1.76	13.36	9,429.20	-1,688.79	-367.43	1,728.24	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)		
111.00	111.00	-0.31	-0.13	First SDI Gyro MWD Survey	
419.00	418.12	-19.40	-5.54	Last SDI Gyro MWD Survey	
488.00	486.19	-30.34	-8.19	First SDI Surface MWD Survey	
1,089.00	1,053.06	-221.21	-48.56	Last SDI Surface MWD Survey	
1,249.00	1,199.34	-284.83	-60.91	First SDI Production MWD Survey	
9,694.00	9,369.23	-1,690.58	-367.86	Last SDI Production MWD Survey	
9,754.00	9,429.20	-1,688.79	-367.43	Projection to TD	

Checked By: _____ Approved By: _____ Date: _____