



Directional Survey Certification

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

Operator	Terra Energy Partners
Well Name & No.	RU 322-7
County & State	Garfield, CO
SDI Job No.	420916DEFK382093
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 83 feet to a measured depth of 9,480 feet is true and correct as determined from all available records.

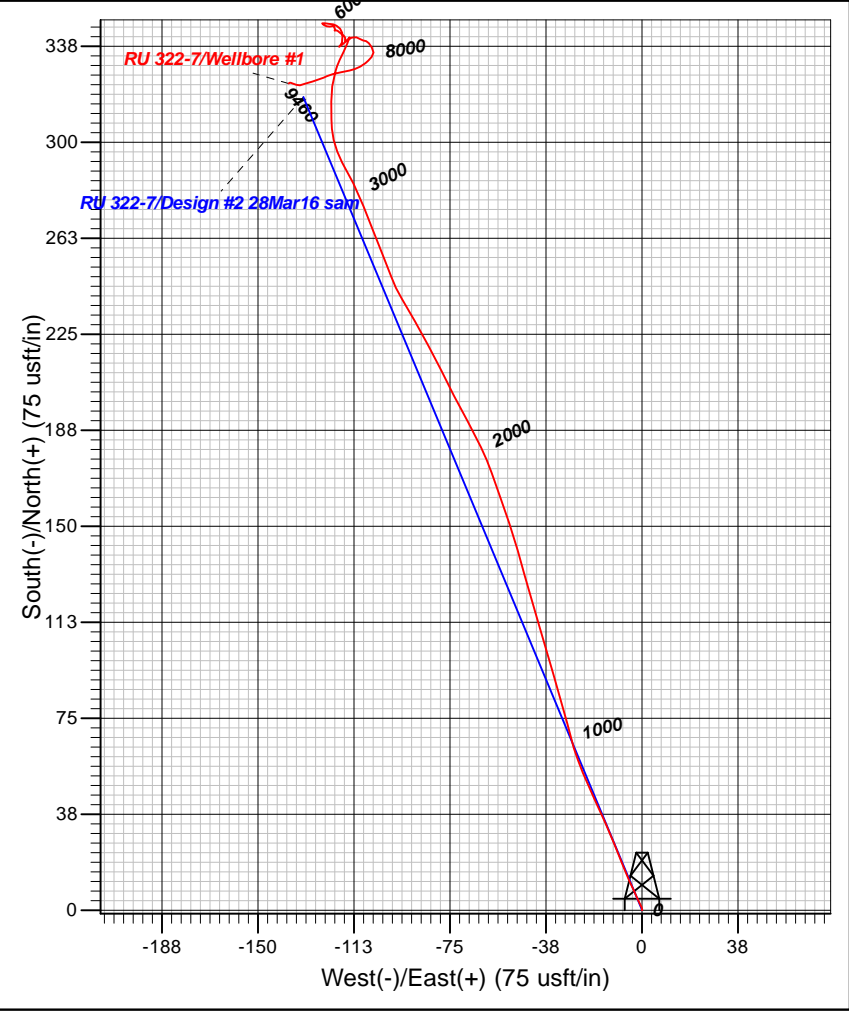
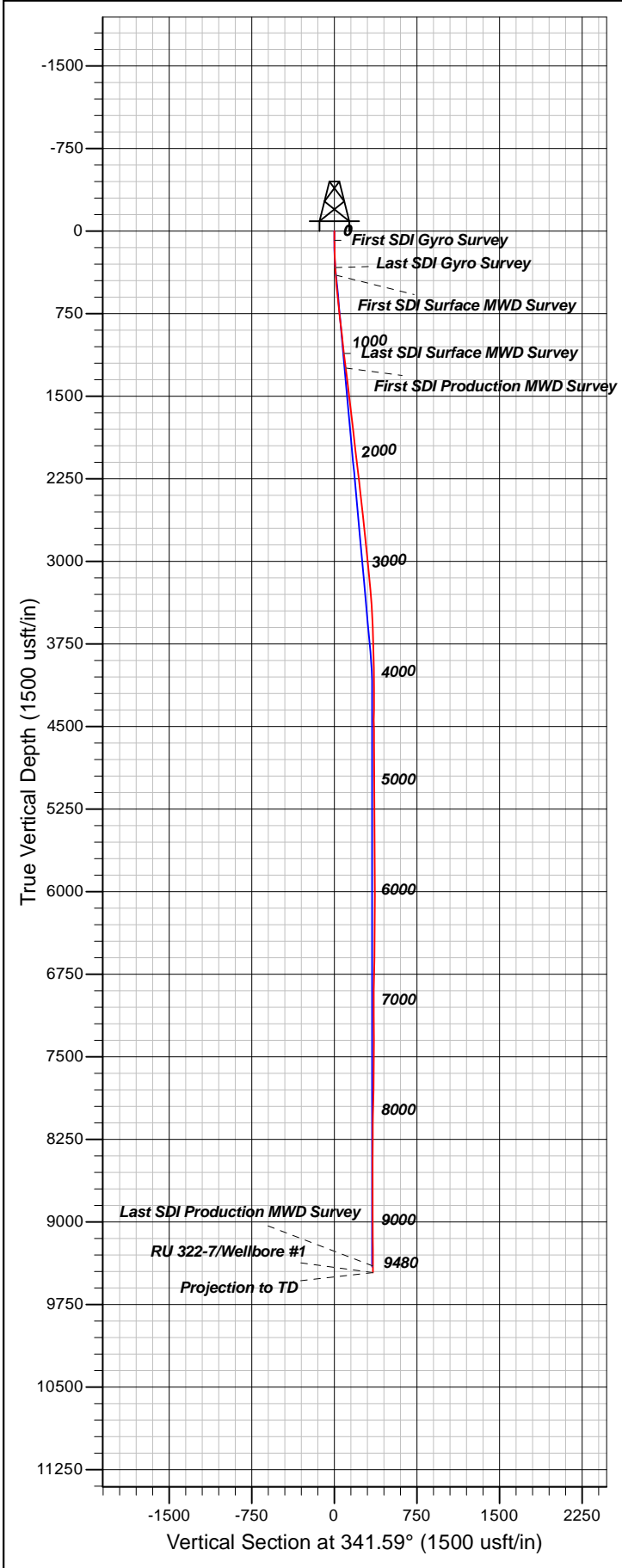
Signature

21-Sep-16

Date

Janie Collins

Colorado District Well Planner
Scientific Drilling International



Well Details: RU 322-7					
TVD Reference: GL 7339' & RKB 24' @ 7363.00usft (H&P 318) Grid Level: 7339.00					
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	1599694.89	2345093.31	39.4569770	-107.8196805
Slot RU 322-7 (A5)					
REFERENCE INFORMATION					
Co-ordinate (N/E) Reference: Well RU 322-7 - Slot RU 322-7 (A5), True North					
Vertical (TVD) Reference: GL 7339' & RKB 24' @ 7363.00usft (H&P 318)					
Section (VS) Reference: Slot - RU 322-7 (A5)(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					
10:17, September 21 2016					
Created By: Janie Collins					

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well RU 322-7 - Slot RU 322-7 (A5)
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 322-7	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 322-7 - Slot RU 322-7 (A5)					
Well Position	+N/-S	0.00 usft	Northing:	1,599,694.88 usft	Latitude:	39.4569770
	+E/-W	0.00 usft	Easting:	2,345,093.31 usft	Longitude:	-107.8196805
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	9/1/2016	9.35	65.68	51,786

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	341.59	

Survey Program	Date	9/21/2016			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
83.00	331.00	Survey #1 - Gyro Survey (Wellbore #1)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
400.00	1,116.00	Survey #2 - Surface MWD Survey (Wellbo	SDI MWD	SDI MWD - Standard ver 1.0.1	
1,249.00	9,480.00	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
83.00	0.26	9.40	83.00	0.19	0.03	0.17	0.31	0.31	0.00	0.00
First SDI Gyro Survey										
150.00	1.58	337.41	149.99	1.19	-0.30	1.22	2.04	1.97	-47.75	
240.00	2.46	335.39	239.93	4.09	-1.58	4.38	0.98	0.98	-2.24	
331.00	2.82	334.16	330.84	7.88	-3.37	8.54	0.40	0.40	-1.35	
Last SDI Gyro Survey										
400.00	3.80	337.19	399.72	11.52	-5.00	12.50	1.44	1.42	4.39	

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well RU 322-7 - Slot RU 322-7 (A5)
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 322-7	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	4.80	337.42	490.46	17.81	-7.63	19.31	1.10	1.10	0.25
583.00	5.61	338.33	582.08	25.54	-10.76	27.64	0.88	0.88	0.99
673.00	6.31	336.33	671.60	34.16	-14.38	36.95	0.81	0.78	-2.22
764.00	7.04	334.68	761.98	43.78	-18.77	47.47	0.83	0.80	-1.81
855.00	6.80	337.77	852.32	53.81	-23.19	58.38	0.49	-0.26	3.40
946.00	5.93	342.43	942.75	63.28	-26.65	68.46	1.11	-0.96	5.12
1,036.00	5.86	346.61	1,032.28	72.18	-29.12	77.68	0.48	-0.08	4.64
1,116.00	6.42	344.39	1,111.82	80.46	-31.26	86.22	0.76	0.70	-2.78
Last SDI Surface MWD Survey									
1,249.00	7.55	343.01	1,243.83	95.98	-35.82	102.38	0.86	0.85	-1.04
First SDI Production MWD Survey									
1,344.00	7.44	344.87	1,338.02	107.89	-39.25	114.76	0.28	-0.12	1.96
1,438.00	6.97	342.64	1,431.28	119.21	-42.54	126.54	0.58	-0.50	-2.37
1,533.00	6.74	344.99	1,525.60	130.09	-45.70	137.87	0.38	-0.24	2.47
1,627.00	6.67	343.68	1,618.96	140.66	-48.66	148.83	0.18	-0.07	-1.39
1,722.00	6.45	342.25	1,713.33	151.04	-51.84	159.68	0.29	-0.23	-1.51
1,816.00	6.50	339.82	1,806.73	161.06	-55.29	170.28	0.30	0.05	-2.59
1,911.00	6.21	340.83	1,901.15	170.96	-58.83	180.79	0.33	-0.31	1.06
2,005.00	6.91	334.46	1,994.54	180.86	-62.94	191.48	1.07	0.74	-6.78
2,099.00	6.98	330.75	2,087.85	190.95	-68.17	202.70	0.48	0.07	-3.95
2,194.00	6.92	333.31	2,182.15	201.10	-73.56	214.04	0.33	-0.06	2.69
2,288.00	6.70	333.31	2,275.49	211.06	-78.56	225.07	0.23	-0.23	0.00
2,382.00	6.58	331.46	2,368.85	220.69	-83.60	235.79	0.26	-0.13	-1.97
2,477.00	6.42	330.94	2,463.24	230.11	-88.78	246.37	0.18	-0.17	-0.55
2,571.00	5.94	328.76	2,556.70	238.86	-93.85	256.28	0.57	-0.51	-2.32
2,666.00	5.88	340.01	2,651.20	247.64	-98.07	265.94	1.22	-0.06	11.84
2,760.00	5.87	337.40	2,744.70	256.60	-101.56	275.55	0.28	-0.01	-2.78
2,854.00	6.13	339.38	2,838.19	265.74	-105.18	285.35	0.35	0.28	2.11
2,949.00	6.06	338.05	2,932.65	275.14	-108.84	295.43	0.17	-0.07	-1.40
3,043.00	5.77	332.72	3,026.15	283.94	-112.86	305.05	0.66	-0.31	-5.67
3,137.00	5.66	331.36	3,119.68	292.21	-117.24	314.28	0.19	-0.12	-1.45
3,232.00	5.70	348.01	3,214.22	300.93	-120.47	323.58	1.73	0.04	17.53
3,326.00	4.26	0.32	3,307.87	308.99	-121.42	331.52	1.90	-1.53	13.10
3,421.00	4.13	358.89	3,402.61	315.94	-121.47	338.13	0.18	-0.14	-1.51
3,515.00	3.18	10.37	3,496.42	321.89	-121.06	343.65	1.27	-1.01	12.21
3,610.00	3.26	12.86	3,591.27	327.11	-119.99	348.27	0.17	0.08	2.62
3,704.00	2.05	28.21	3,685.17	331.20	-118.60	351.71	1.48	-1.29	16.33
3,798.00	2.02	24.59	3,779.11	334.19	-117.11	354.07	0.14	-0.03	-3.85
3,892.00	2.08	22.71	3,873.05	337.27	-115.77	356.57	0.10	0.06	-2.00
3,987.00	0.77	16.29	3,968.02	339.47	-114.92	358.39	1.39	-1.38	-6.76
4,081.00	0.80	25.35	4,062.01	340.67	-114.46	359.39	0.14	0.03	9.64
4,175.00	0.28	205.76	4,156.01	341.06	-114.28	359.69	1.15	-0.55	-191.05
4,269.00	0.45	222.02	4,250.01	340.58	-114.63	359.35	0.21	0.18	17.30

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well RU 322-7 - Slot RU 322-7 (A5)
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Site:	RU 22-7 Pad	MD Reference:	GL 7339' & RKB 24' @ 7363.00usft (H&P 318)
Well:	RU 322-7	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	0.76	223.74	4,345.00	339.84	-115.31	358.87	0.33	0.33	1.81	
4,458.00	0.34	311.91	4,439.00	339.58	-115.95	358.82	0.88	-0.45	93.80	
4,553.00	0.51	14.83	4,534.00	340.18	-116.05	359.42	0.49	0.18	66.23	
4,647.00	0.07	204.50	4,628.00	340.53	-115.97	359.73	0.62	-0.47	-181.20	
4,741.00	0.30	7.61	4,722.00	340.72	-115.96	359.91	0.39	0.24	173.52	
4,835.00	0.70	317.93	4,815.99	341.39	-116.31	360.65	0.59	0.43	-52.85	
4,930.00	0.69	295.32	4,910.99	342.07	-117.22	361.58	0.29	-0.01	-23.80	
5,024.00	0.61	328.68	5,004.98	342.74	-117.99	362.46	0.41	-0.09	35.49	
5,119.00	1.04	297.94	5,099.97	343.57	-119.02	363.58	0.63	0.45	-32.36	
5,213.00	0.44	241.69	5,193.96	343.80	-120.09	364.13	0.93	-0.64	-59.84	
5,307.00	0.34	90.83	5,287.96	343.63	-120.13	363.98	0.80	-0.11	-160.49	
5,401.00	0.45	352.41	5,381.96	343.99	-119.90	364.25	0.64	0.12	-104.70	
5,496.00	0.44	314.37	5,476.96	344.61	-120.21	364.94	0.31	-0.01	-40.04	
5,590.00	0.38	29.10	5,570.96	345.14	-120.31	365.47	0.53	-0.06	79.50	
5,684.00	0.83	266.76	5,664.95	345.37	-120.84	365.86	1.15	0.48	-130.15	
5,778.00	0.68	258.55	5,758.94	345.22	-122.07	366.10	0.20	-0.16	-8.73	
5,872.00	0.79	289.55	5,852.94	345.33	-123.23	366.57	0.43	0.12	32.98	
5,967.00	0.82	298.57	5,947.93	345.87	-124.44	367.47	0.14	0.03	9.49	
6,062.00	0.30	12.35	6,042.92	346.44	-124.98	368.18	0.83	-0.55	77.66	
6,157.00	1.07	101.42	6,137.92	346.51	-124.06	367.95	1.16	0.81	93.76	
6,251.00	1.15	91.74	6,231.90	346.31	-122.26	367.19	0.22	0.09	-10.30	
6,345.00	0.76	110.01	6,325.89	346.06	-120.73	366.48	0.52	-0.41	19.44	
6,439.00	1.07	112.07	6,419.88	345.52	-119.33	365.52	0.33	0.33	2.19	
6,534.00	1.14	148.13	6,514.86	344.38	-118.01	364.03	0.72	0.07	37.96	
6,628.00	1.06	160.17	6,608.84	342.77	-117.22	362.25	0.26	-0.09	12.81	
6,723.00	0.74	193.19	6,703.83	341.35	-117.06	360.85	0.63	-0.34	34.76	
6,817.00	0.70	182.23	6,797.82	340.18	-117.22	359.79	0.15	-0.04	-11.66	
6,911.00	0.70	184.43	6,891.82	339.04	-117.29	358.73	0.03	0.00	2.34	
7,006.00	0.78	225.93	6,986.81	338.01	-117.80	357.91	0.56	0.08	43.68	
7,101.00	0.26	208.16	7,081.80	337.37	-118.36	357.48	0.57	-0.55	-18.71	
7,195.00	1.49	54.53	7,175.79	337.89	-117.47	357.70	1.84	1.31	-163.44	
7,290.00	1.58	46.88	7,270.76	339.50	-115.51	358.61	0.24	0.09	-8.05	
7,385.00	1.41	65.78	7,365.73	340.88	-113.49	359.27	0.55	-0.18	19.89	
7,479.00	1.04	111.21	7,459.71	341.04	-111.64	358.84	1.07	-0.39	48.33	
7,573.00	0.94	121.29	7,553.70	340.33	-110.18	357.71	0.21	-0.11	10.72	
7,668.00	0.71	106.24	7,648.69	339.76	-108.95	356.78	0.33	-0.24	-15.84	
7,762.00	0.71	98.46	7,742.68	339.52	-107.82	356.19	0.10	0.00	-8.28	
7,857.00	1.05	147.14	7,837.67	338.70	-106.76	355.08	0.83	0.36	51.24	
7,951.00	1.41	144.85	7,931.65	337.03	-105.63	353.14	0.39	0.38	-2.44	
8,045.00	1.21	181.79	8,025.62	335.09	-104.99	351.10	0.91	-0.21	39.30	
8,140.00	1.23	221.61	8,120.60	333.33	-105.70	349.65	0.87	0.02	41.92	
8,234.00	1.14	222.68	8,214.58	331.88	-107.01	348.69	0.10	-0.10	1.14	
8,329.00	1.49	238.83	8,309.56	330.55	-108.70	347.96	0.53	0.37	17.00	

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Site:	RU 22-7 Pad	MD Reference:	GL 7339' & RKB 24' @ 7363.00usft (H&P 318)
Well:	RU 322-7	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)	
8,423.00	2.11	239.01	8,403.51	329.03	-111.23	347.32	0.66	0.66	0.19	
8,518.00	2.81	263.88	8,498.43	327.88	-115.05	347.43	1.33	0.74	26.18	
8,612.00	2.87	253.27	8,592.31	326.96	-119.59	347.99	0.56	0.06	-11.29	
8,706.00	3.33	248.85	8,686.17	325.29	-124.39	347.93	0.55	0.49	-4.70	
8,801.00	2.13	251.90	8,781.06	323.75	-128.64	347.81	1.27	-1.26	3.21	
8,895.00	1.69	254.89	8,875.01	322.84	-131.64	347.90	0.48	-0.47	3.18	
8,989.00	0.90	256.81	8,968.99	322.31	-133.70	348.04	0.84	-0.84	2.04	
9,084.00	0.77	294.64	9,063.98	322.41	-135.01	348.55	0.58	-0.14	39.82	
9,178.00	0.91	286.97	9,157.97	322.89	-136.29	349.41	0.19	0.15	-8.16	
9,272.00	0.37	295.06	9,251.96	323.24	-137.28	350.05	0.58	-0.57	8.61	
9,367.00	0.17	231.20	9,346.96	323.28	-137.67	350.21	0.35	-0.21	-67.22	
9,420.00	0.26	229.43	9,399.96	323.15	-137.82	350.14	0.17	0.17	-3.34	
Last SDI Production MWD Survey										
9,480.00	0.26	229.43	9,459.96	322.98	-138.03	350.04	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)		
83.00	83.00	0.19	0.03	First SDI Gyro Survey	
331.00	330.84	7.88	-3.37	Last SDI Gyro Survey	
400.00	399.72	11.52	-5.00	First SDI Surface MWD Survey	
1,116.00	1,111.82	80.46	-31.26	Last SDI Surface MWD Survey	
1,249.00	1,243.83	95.98	-35.82	First SDI Production MWD Survey	
9,420.00	9,399.96	323.15	-137.82	Last SDI Production MWD Survey	
9,480.00	9,459.96	322.98	-138.03	Projection to TD	

Checked By: _____ Approved By: _____ Date: _____