



## Directional Survey Certification

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

<b>Operator</b>	Terra Energy Partners
<b>Well Name &amp; No.</b>	RU 423-7
<b>County &amp; State</b>	Garfield, CO
<b>SDI Job No.</b>	420716DEFK374439
<b>Rig</b>	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 117 feet to a measured depth of 9,606 feet is true and correct as determined from all available records.

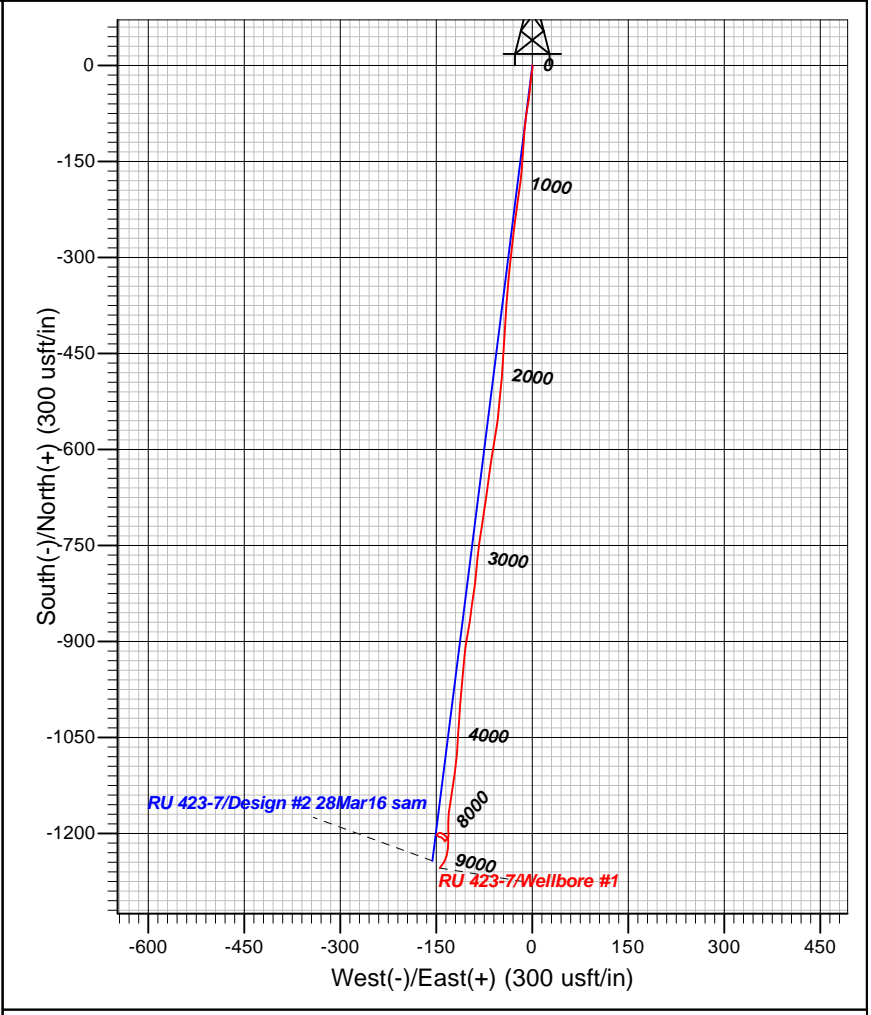
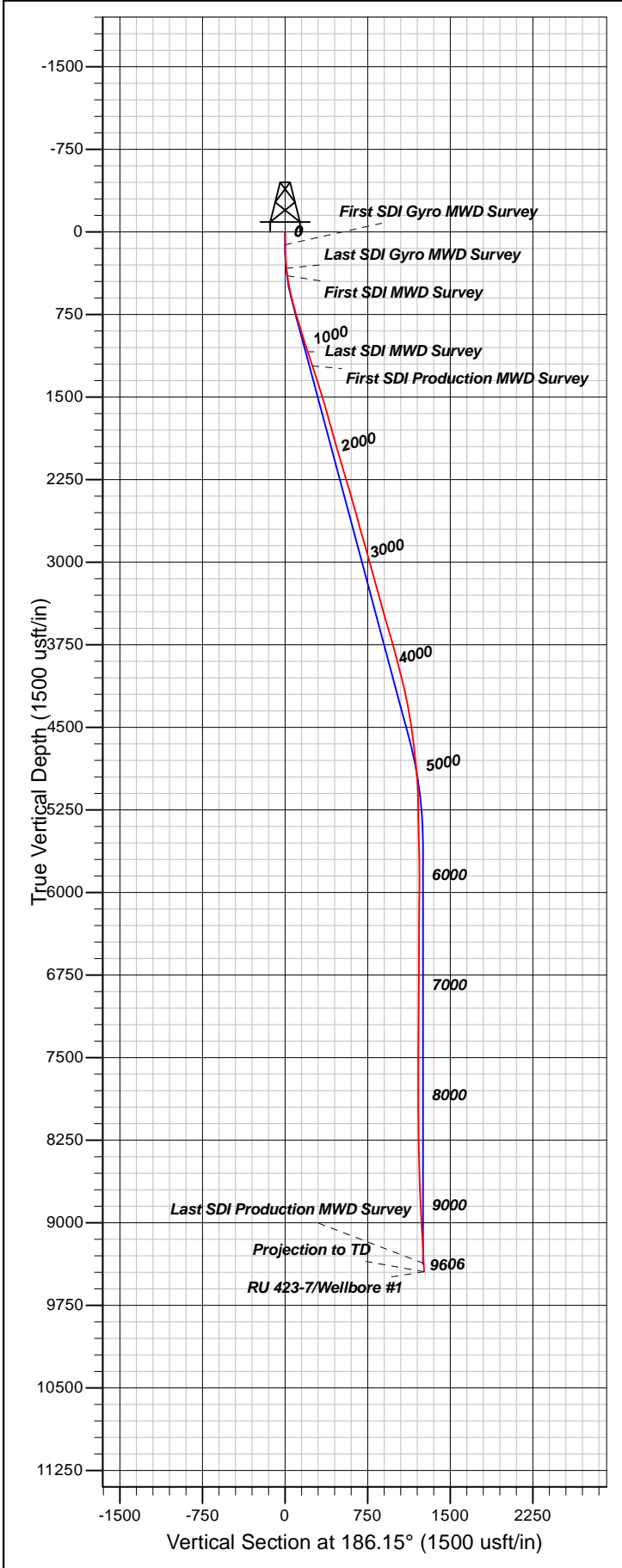
Signature

4-Aug-16

Date

### Janie Collins

Colorado District Well Planner  
Scientific Drilling International



**Well Details: RU 423-7**

TVD Reference: GL 7339' & RKB 24' @ 7363.00usft (H&P 318) and Level: 7339.00						
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	1599666.53	2345083.50	39.4568985	-107.8197127	A1

**REFERENCE INFORMATION**

Co-ordinate (N/E) Reference: Well RU 423-7 - Slot A1, True North  
 Vertical (TVD) Reference: GL 7339' & RKB 24' @ 7363.00usft (H&P 318)  
 Section (VS) Reference: Slot - A1(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

<b>Company:</b>	Terra Energy Partners	<b>Local Co-ordinate Reference:</b>	Well RU 423-7 - Slot A1
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 7339' & RKB 24' @ 7363.01ft (H&P 318)
<b>Site:</b>	RU 22-7 Pad	<b>MD Reference:</b>	GL 7339' & RKB 24' @ 7363.01ft (H&P 318)
<b>Well:</b>	RU 423-7	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Grand Junction District

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

<b>Site</b>	RU 22-7 Pad				
<b>Site Position:</b>		<b>Northing:</b>	1,599,673.59 usft	<b>Latitude:</b>	39.4569181
<b>From:</b>	Map	<b>Easting:</b>	2,345,086.00 usft	<b>Longitude:</b>	-107.8197045
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b>	-1.46 °

<b>Well</b>	RU 423-7 - Slot A1					
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>	1,599,666.53 usft	<b>Latitude:</b>	39.4568985
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>	2,345,083.50 usft	<b>Longitude:</b>	-107.8197127
<b>Position Uncertainty</b>		0.00 ft	<b>Wellhead Elevation:</b>	0.00 ft	<b>Ground Level:</b>	7,339.01 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM	7/23/2016	9.35	65.68	51,799

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	186.15	

<b>Survey Program</b>	<b>Date</b>	8/4/2016			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
117.00	330.00	Survey #1 - Gyro Survey (Wellbore #1)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
400.00	1,114.00	Survey #2 - Surface MWD Survey (Wellbo	SDI MWD	SDI MWD - Standard ver 1.0.1	
1,250.00	9,606.00	Survey #3 - Production MWD Survey (Wel	SDI MWD	SDI MWD - Standard ver 1.0.1	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
117.00	0.53	170.86	117.00	-0.53	0.09	0.52	0.45	0.45	0.00	
<b>First SDI Gyro MWD Survey</b>										
149.00	1.23	173.50	148.99	-1.02	0.15	1.00	2.19	2.19	8.25	
239.00	3.26	185.10	238.92	-4.53	0.03	4.50	2.30	2.26	12.89	
330.00	6.07	190.72	329.61	-11.84	-1.09	11.89	3.12	3.09	6.18	
<b>Last SDI Gyro MWD Survey</b>										
400.00	8.26	186.50	399.06	-20.47	-2.35	20.60	3.22	3.13	-6.03	

<b>Company:</b>	Terra Energy Partners	<b>Local Co-ordinate Reference:</b>	Well RU 423-7 - Slot A1
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 7339' & RKB 24' @ 7363.01ft (H&P 318)
<b>Site:</b>	RU 22-7 Pad	<b>MD Reference:</b>	GL 7339' & RKB 24' @ 7363.01ft (H&P 318)
<b>Well:</b>	RU 423-7	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Grand Junction District

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
<b>First SDI MWD Survey</b>									
491.00	10.70	185.21	488.81	-35.38	-3.86	35.59	2.69	2.68	-1.42
583.00	12.81	187.05	578.88	-54.01	-5.89	54.33	2.33	2.29	2.00
673.00	15.32	189.48	666.17	-75.64	-9.07	76.18	2.86	2.79	2.70
764.00	16.58	185.90	753.67	-100.42	-12.39	101.17	1.76	1.38	-3.93
855.00	17.23	182.23	840.74	-126.80	-14.24	127.60	1.37	0.71	-4.03
946.00	17.43	184.01	927.61	-153.86	-15.72	154.66	0.62	0.22	1.96
1,036.00	16.79	188.39	1,013.63	-180.17	-18.56	181.12	1.60	-0.71	4.87
1,114.00	17.67	188.12	1,088.13	-203.04	-21.88	204.21	1.13	1.13	-0.35
<b>Last SDI MWD Survey</b>									
1,250.00	18.66	187.29	1,217.35	-245.05	-27.55	246.59	0.75	0.73	-0.61
<b>First SDI Production MWD Survey</b>									
1,344.00	18.25	186.36	1,306.51	-274.59	-31.09	276.34	0.54	-0.44	-0.99
1,439.00	17.47	186.03	1,396.94	-303.56	-34.24	305.48	0.83	-0.82	-0.35
1,533.00	17.08	185.11	1,486.70	-331.34	-36.95	333.39	0.51	-0.41	-0.98
1,628.00	16.35	185.04	1,577.68	-358.56	-39.37	360.71	0.77	-0.77	-0.07
1,722.00	15.15	184.03	1,668.15	-383.99	-41.39	386.21	1.31	-1.28	-1.07
1,817.00	16.24	183.91	1,759.61	-409.63	-43.17	411.89	1.15	1.15	-0.13
1,911.00	15.90	182.97	1,849.93	-435.60	-44.74	437.88	0.46	-0.36	-1.00
2,005.00	15.43	182.08	1,940.44	-460.95	-45.86	463.21	0.56	-0.50	-0.95
2,100.00	16.44	185.99	2,031.79	-486.96	-47.72	489.26	1.55	1.06	4.12
2,194.00	16.74	186.33	2,121.88	-513.64	-50.60	516.10	0.34	0.32	0.36
2,289.00	16.06	184.00	2,213.02	-540.35	-53.02	542.92	1.00	-0.72	-2.45
2,383.00	16.65	189.34	2,303.22	-566.61	-56.12	569.36	1.72	0.63	5.68
2,477.00	16.57	189.58	2,393.29	-593.11	-60.53	596.18	0.11	-0.09	0.26
2,572.00	16.02	187.55	2,484.48	-619.46	-64.51	622.81	0.83	-0.58	-2.14
2,666.00	15.42	189.09	2,574.96	-644.66	-68.19	648.26	0.78	-0.64	1.64
2,760.00	14.76	187.03	2,665.72	-668.89	-71.63	672.71	0.90	-0.70	-2.19
2,855.00	16.27	188.51	2,757.26	-694.06	-75.08	698.11	1.64	1.59	1.56
2,949.00	16.02	189.03	2,847.55	-719.89	-79.06	724.22	0.31	-0.27	0.55
3,044.00	15.76	187.68	2,938.92	-745.63	-82.84	750.21	0.48	-0.27	-1.42
3,138.00	15.43	185.74	3,029.46	-770.72	-85.80	775.48	0.66	-0.35	-2.06
3,232.00	15.05	185.49	3,120.15	-795.31	-88.22	800.18	0.41	-0.40	-0.27
3,327.00	16.21	188.59	3,211.64	-820.70	-91.38	825.77	1.50	1.22	3.26
3,421.00	14.95	187.03	3,302.19	-845.71	-94.82	851.00	1.41	-1.34	-1.66
3,516.00	15.86	188.97	3,393.77	-870.69	-98.35	876.22	1.10	0.96	2.04
3,610.00	15.29	190.41	3,484.32	-895.57	-102.59	901.41	0.73	-0.61	1.53
3,704.00	16.53	185.39	3,574.72	-921.08	-106.09	927.14	1.97	1.32	-5.34
3,799.00	16.36	184.73	3,665.84	-947.87	-108.46	954.03	0.27	-0.18	-0.69
3,893.00	15.80	185.83	3,756.16	-973.79	-110.85	980.06	0.68	-0.60	1.17
3,987.00	15.11	183.52	3,846.76	-998.75	-112.90	1,005.10	0.98	-0.73	-2.46
4,081.00	14.64	183.80	3,937.61	-1,022.83	-114.44	1,029.21	0.51	-0.50	0.30
4,176.00	13.98	184.34	4,029.66	-1,046.25	-116.11	1,052.67	0.71	-0.69	0.57
4,270.00	13.17	182.18	4,121.04	-1,068.28	-117.37	1,074.70	1.02	-0.86	-2.30

<b>Company:</b>	Terra Energy Partners	<b>Local Co-ordinate Reference:</b>	Well RU 423-7 - Slot A1
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 7339' & RKB 24' @ 7363.01ft (H&P 318)
<b>Site:</b>	RU 22-7 Pad	<b>MD Reference:</b>	GL 7339' & RKB 24' @ 7363.01ft (H&P 318)
<b>Well:</b>	RU 423-7	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Grand Junction District

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
4,364.00	11.98	188.31	4,212.78	-1,088.63	-119.19	1,095.14	1.90	-1.27	6.52	
4,459.00	11.43	187.35	4,305.81	-1,107.72	-121.82	1,114.40	0.61	-0.58	-1.01	
4,553.00	8.95	188.59	4,398.32	-1,124.19	-124.10	1,131.02	2.65	-2.64	1.32	
4,647.00	8.24	188.40	4,491.26	-1,138.09	-126.18	1,145.06	0.76	-0.76	-0.20	
4,742.00	7.51	187.91	4,585.36	-1,150.97	-128.03	1,158.06	0.77	-0.77	-0.52	
4,836.00	6.95	188.89	4,678.62	-1,162.68	-129.75	1,169.88	0.61	-0.60	1.04	
4,930.00	5.86	184.88	4,772.03	-1,173.08	-131.04	1,180.36	1.25	-1.16	-4.27	
5,024.00	5.51	180.10	4,865.57	-1,182.37	-131.46	1,189.65	0.63	-0.37	-5.09	
5,119.00	3.77	180.21	4,960.25	-1,190.05	-131.48	1,197.29	1.83	-1.83	0.12	
5,213.00	3.68	178.63	5,054.05	-1,196.16	-131.41	1,203.36	0.15	-0.10	-1.68	
5,308.00	1.31	176.95	5,148.96	-1,200.29	-131.28	1,207.45	2.50	-2.49	-1.77	
5,402.00	0.84	165.48	5,242.94	-1,202.03	-131.05	1,209.16	0.55	-0.50	-12.20	
5,496.00	1.05	192.22	5,336.93	-1,203.54	-131.06	1,210.66	0.51	0.22	28.45	
5,590.00	1.08	202.15	5,430.91	-1,205.20	-131.58	1,212.36	0.20	0.03	10.56	
5,685.00	0.92	202.53	5,525.90	-1,206.74	-132.21	1,213.96	0.17	-0.17	0.40	
5,779.00	1.04	227.83	5,619.88	-1,208.01	-133.13	1,215.32	0.47	0.13	26.91	
5,873.00	1.38	223.63	5,713.86	-1,209.40	-134.54	1,216.85	0.37	0.36	-4.47	
5,968.00	1.65	210.20	5,808.83	-1,211.41	-136.02	1,219.01	0.47	0.28	-14.14	
6,062.00	0.53	307.91	5,902.82	-1,212.31	-137.05	1,220.02	1.91	-1.19	103.95	
6,157.00	0.70	350.54	5,997.81	-1,211.47	-137.49	1,219.23	0.50	0.18	44.87	
6,251.00	0.91	330.95	6,091.80	-1,210.25	-137.94	1,218.06	0.37	0.22	-20.84	
6,346.00	0.78	325.71	6,186.79	-1,209.06	-138.67	1,216.96	0.16	-0.14	-5.52	
6,440.00	0.76	305.73	6,280.78	-1,208.16	-139.54	1,216.16	0.28	-0.02	-21.26	
6,534.00	0.95	316.44	6,374.77	-1,207.24	-140.58	1,215.35	0.26	0.20	11.39	
6,629.00	0.69	286.70	6,469.76	-1,206.50	-141.68	1,214.74	0.52	-0.27	-31.31	
6,723.00	0.56	306.04	6,563.76	-1,206.07	-142.59	1,214.40	0.26	-0.14	20.57	
6,817.00	0.59	306.11	6,657.75	-1,205.51	-143.35	1,213.93	0.03	0.03	0.07	
6,912.00	0.76	277.16	6,752.75	-1,205.15	-144.37	1,213.68	0.40	0.18	-30.47	
7,006.00	0.87	271.40	6,846.74	-1,205.05	-145.70	1,213.72	0.15	0.12	-6.13	
7,101.00	0.65	309.52	6,941.73	-1,204.69	-146.84	1,213.49	0.57	-0.23	40.13	
7,196.00	0.57	307.53	7,036.72	-1,204.06	-147.63	1,212.95	0.09	-0.08	-2.09	
7,291.00	0.58	305.29	7,131.72	-1,203.49	-148.40	1,212.47	0.03	0.01	-2.36	
7,385.00	0.55	313.89	7,225.71	-1,202.91	-149.11	1,211.96	0.10	-0.03	9.15	
7,479.00	0.84	330.68	7,319.71	-1,201.99	-149.77	1,211.12	0.37	0.31	17.86	
7,574.00	1.00	68.48	7,414.70	-1,201.08	-149.34	1,210.17	1.46	0.17	102.95	
7,668.00	1.26	55.79	7,508.68	-1,200.20	-147.73	1,209.12	0.38	0.28	-13.50	
7,763.00	2.14	65.30	7,603.64	-1,198.87	-145.25	1,207.53	0.97	0.93	10.01	
7,857.00	1.64	125.92	7,697.60	-1,198.93	-142.57	1,207.30	2.08	-0.53	64.49	
7,951.00	1.84	116.22	7,791.55	-1,200.38	-140.12	1,208.49	0.38	0.21	-10.32	
8,046.00	1.12	130.15	7,886.52	-1,201.65	-138.05	1,209.53	0.84	-0.76	14.66	
8,140.00	0.81	131.10	7,980.51	-1,202.68	-136.84	1,210.42	0.33	-0.33	1.01	
8,235.00	0.66	127.52	8,075.50	-1,203.46	-135.90	1,211.09	0.17	-0.16	-3.77	
8,329.00	0.79	147.91	8,169.49	-1,204.34	-135.13	1,211.88	0.31	0.14	21.69	

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<b>Site:</b>	RU 22-7 Pad	<b>MD Reference:</b>	GL 7339' & RKB 24' @ 7363.01ft (H&P 318)
<b>Well:</b>	RU 423-7	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Grand Junction District

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
8,423.00	1.14	133.19	8,263.48	-1,205.53	-134.10	1,212.96	0.45	0.37	-15.66	
8,518.00	1.05	132.16	8,358.46	-1,206.76	-132.77	1,214.04	0.10	-0.09	-1.08	
8,612.00	1.14	166.23	8,452.45	-1,208.24	-131.91	1,215.42	0.69	0.10	36.24	
8,707.00	1.76	175.91	8,547.41	-1,210.62	-131.58	1,217.75	0.70	0.65	10.19	
8,801.00	2.44	182.94	8,641.35	-1,214.06	-131.58	1,221.16	0.77	0.72	7.48	
8,895.00	2.98	186.54	8,735.25	-1,218.48	-131.96	1,225.61	0.60	0.57	3.83	
8,990.00	2.99	180.74	8,830.12	-1,223.41	-132.27	1,230.54	0.32	0.01	-6.11	
9,084.00	2.71	187.66	8,924.00	-1,228.07	-132.60	1,235.20	0.47	-0.30	7.36	
9,178.00	3.36	192.95	9,017.87	-1,232.95	-133.51	1,240.16	0.75	0.69	5.63	
9,273.00	3.67	201.12	9,112.69	-1,238.50	-135.23	1,245.86	0.62	0.33	8.60	
9,367.00	3.10	213.62	9,206.53	-1,243.42	-137.72	1,251.02	0.99	-0.61	13.30	
9,462.00	2.75	212.41	9,301.40	-1,247.49	-140.37	1,255.35	0.37	-0.37	-1.27	
9,530.00	3.08	214.57	9,369.32	-1,250.37	-142.28	1,258.42	0.51	0.49	3.18	
<b>Last SDI Production MWD Survey</b>										
9,606.00	3.08	214.57	9,445.21	-1,253.73	-144.60	1,262.01	0.00	0.00	0.00	
<b>Projection to TD</b>										

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
117.00	117.00	-0.53	0.09	First SDI Gyro MWD Survey	
330.00	329.61	-11.84	-1.09	Last SDI Gyro MWD Survey	
400.00	399.06	-20.47	-2.35	First SDI MWD Survey	
1,114.00	1,088.13	-203.04	-21.88	Last SDI MWD Survey	
1,250.00	1,217.35	-245.05	-27.55	First SDI Production MWD Survey	
9,530.00	9,369.32	-1,250.37	-142.28	Last SDI Production MWD Survey	
9,606.00	9,445.21	-1,253.73	-144.60	Projection to TD	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_