



Company: B.P.  
Project: La Plata County, CO NAD83  
Site: Harper Pad  
Well: Harper 01-18 2

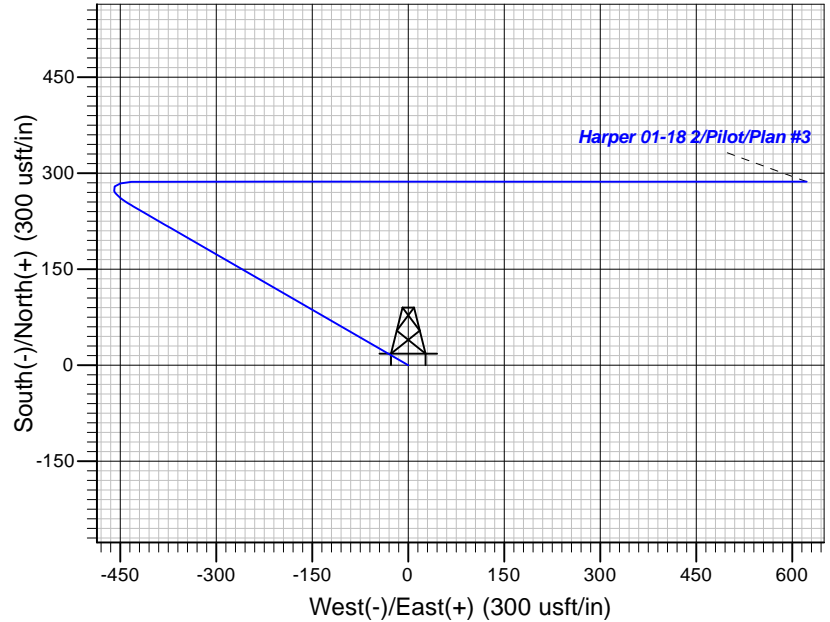
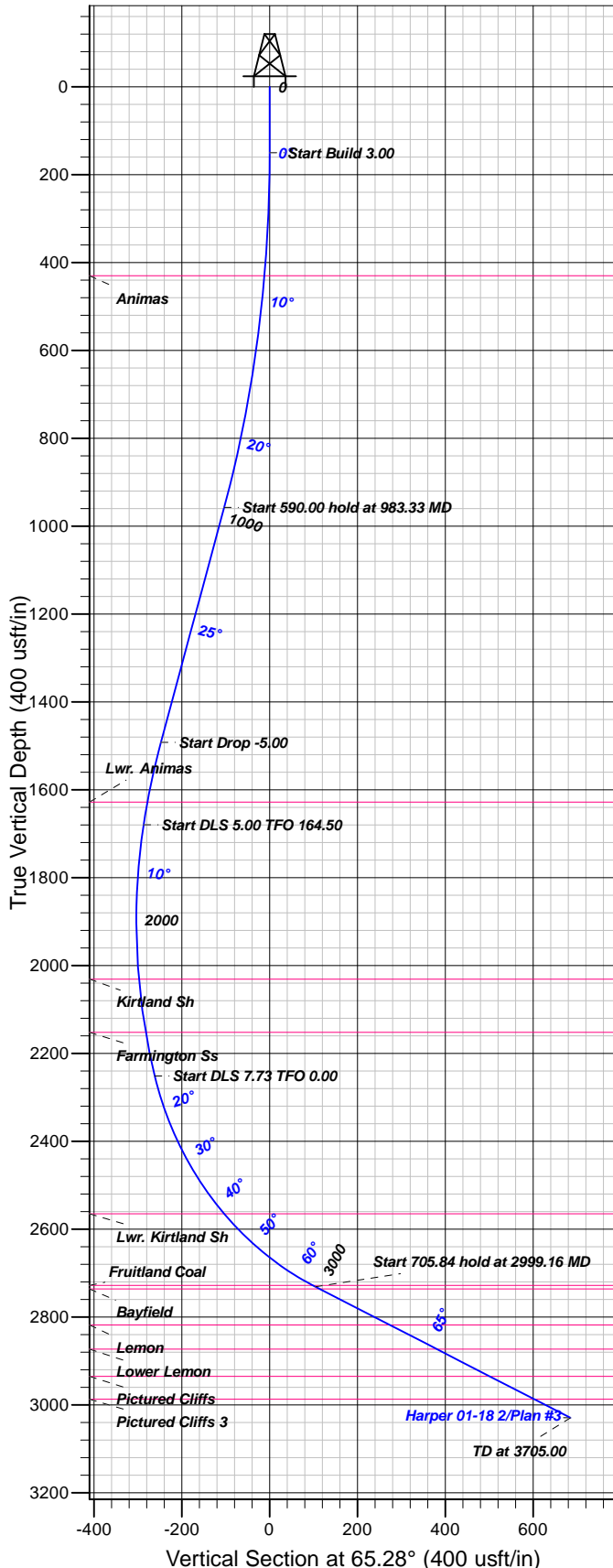


### Well Details: Harper 01-18 2

GL 6919' & RKB 11' @ 6930.00usft (Aztec 507)

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	1196059.56	2404386.66	37.1872087	-107.5447140	

Azimuths to Grid North  
True North: 1.25°  
Magnetic North: 10.45°  
Magnetic Field  
Strength: 50109.5snT  
Dip Angle: 63.65°  
Date: 1/19/2018  
Model: HDGM



### FORMATION TOP DETAILS

TVDPth	MDPath	Formation
430.00	431.01	Animas
1628.00	1719.59	Lwr. Animas
2031.00	2128.72	Kirtland Sh
2152.00	2250.82	Farmington Ss
2565.00	2714.92	Lwr. Kirtland Sh
2728.00	2992.14	Fruitland Coal
2736.00	3010.99	Bayfield
2818.00	3205.02	Lemon
2873.00	3335.16	Lower Lemon
2935.00	3481.87	Pictured Cliffs
2987.00	3604.91	Pictured Cliffs 3

Plan: Plan #3

9:58, January 22 2018  
Created By: Janie Collins

PROJECT DETAILS: La Plata County, CO NAD83

Geodetic System: US State Plane 1983  
Datum: North American Datum 1983  
Ellipsoid: GRS 1980  
Zone: Colorado Southern Zone

System Datum: Mean Sea Level

### CASING DETAILS

No casing data is available

### SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VFace	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	150.00	0.00	0.00	150.00	0.00	0.00	0.00	0.00	0.00	
3	983.33	25.00	300.00	957.14	89.47	-154.97	3.00	300.00	-103.35	
4	1573.33	25.00	300.00	1491.86	214.14	-370.90	0.00	0.00	-247.37	
5	1773.33	15.00	300.00	1679.56	248.30	-430.07	5.00	180.00	-286.83	
6	2352.43	15.00	90.00	2251.15	286.59	-419.81	5.00	164.50	-261.50	
7	2999.16	65.00	90.00	2731.00	286.59	-17.16	7.73	0.00	104.25	
8	3705.00	65.00	90.00	3029.30	286.59	622.54	0.00	0.00	685.34	

### DESIGN TARGET DETAILS

No target data is available.



**B.P.**

**La Plata County, CO NAD83**

**Harper Pad**

**Harper 01-18 2**

**Pilot**

**Plan: Plan #3**

## **Standard Planning Report**

**22 January, 2018**





<b>Database:</b>	Grand Junction District	<b>Local Co-ordinate Reference:</b>	Well Harper 01-18 2
<b>Company:</b>	B.P.	<b>TVD Reference:</b>	GL 6919' & RKB 11' @ 6930.00usft (Aztec 507)
<b>Project:</b>	La Plata County, CO NAD83	<b>MD Reference:</b>	GL 6919' & RKB 11' @ 6930.00usft (Aztec 507)
<b>Site:</b>	Harper Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	Harper 01-18 2	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Pilot		
<b>Design:</b>	Plan #3		

<b>Project</b>	La Plata 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 Southern Zone		

<b>Site</b>	Harper Pad			
<b>Site Position:</b>		<b>Northing:</b>	1,196,059.56 usft	<b>Latitude:</b> 37.1872086
<b>From:</b> Map		<b>Easting:</b>	2,404,386.66 usft	<b>Longitude:</b> -107.5447140
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13.20 in	<b>Grid Convergence:</b> -1.25 °

<b>Well</b>	Harper 01-18 2			
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	1,196,059.56 usft
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	2,404,386.66 usft
<b>Position Uncertainty</b>	0.00 usft		<b>Wellhead Elevation:</b>	0.00 usft
			<b>Ground Level:</b>	6,919.00 usft

<b>Wellbore</b>	Pilot				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM	1/19/2018	9.20	63.65	50,110

<b>Design</b>	Plan #3			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	65.28

<b>Plan Sections</b>										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
150.00	0.00	0.00	150.00	0.00	0.00	0.00	0.00	0.00	0.00	
983.33	25.00	300.00	957.14	89.47	-154.97	3.00	3.00	0.00	300.00	
1,573.33	25.00	300.00	1,491.86	214.14	-370.90	0.00	0.00	0.00	0.00	
1,773.33	15.00	300.00	1,679.56	248.30	-430.07	5.00	-5.00	0.00	180.00	
2,352.43	15.00	90.00	2,251.15	286.59	-419.81	5.00	0.00	25.90	164.50	
2,999.16	65.00	90.00	2,731.00	286.59	-17.16	7.73	7.73	0.00	0.00	
3,705.00	65.00	90.00	3,029.30	286.59	622.54	0.00	0.00	0.00	0.00	



<b>Database:</b>	Grand Junction District	<b>Local Co-ordinate Reference:</b>	Well Harper 01-18 2
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<b>Project:</b>	La Plata County, CO NAD83	<b>MD Reference:</b>	GL 6919' & RKB 11' @ 6930.00usft (Aztec 507)
<b>Site:</b>	Harper Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	Harper 01-18 2	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Pilot		
<b>Design:</b>	Plan #3		

Planned 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	
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	
150.00	0.00	0.00	150.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	1.50	300.00	199.99	0.33	-0.57	-0.38	3.00	3.00	0.00	
300.00	4.50	300.00	299.85	2.94	-5.10	-3.40	3.00	3.00	0.00	
400.00	7.50	300.00	399.29	8.17	-14.15	-9.44	3.00	3.00	0.00	
431.01	8.43	300.00	430.00	10.32	-17.87	-11.92	3.00	3.00	0.00	
<b>Animas</b>										
500.00	10.50	300.00	498.04	15.99	-27.70	-18.47	3.00	3.00	0.00	
600.00	13.50	300.00	595.85	26.38	-45.70	-30.48	3.00	3.00	0.00	
700.00	16.50	300.00	692.43	39.32	-68.11	-45.43	3.00	3.00	0.00	
800.00	19.50	300.00	787.52	54.77	-94.87	-63.27	3.00	3.00	0.00	
900.00	22.50	300.00	880.87	72.69	-125.90	-83.97	3.00	3.00	0.00	
983.33	25.00	300.00	957.14	89.47	-154.97	-103.35	3.00	3.00	0.00	
1,000.00	25.00	300.00	972.25	92.99	-161.07	-107.42	0.00	0.00	0.00	
1,100.00	25.00	300.00	1,062.88	114.12	-197.67	-131.83	0.00	0.00	0.00	
1,200.00	25.00	300.00	1,153.51	135.25	-234.27	-156.24	0.00	0.00	0.00	
1,300.00	25.00	300.00	1,244.14	156.38	-270.87	-180.65	0.00	0.00	0.00	
1,400.00	25.00	300.00	1,334.77	177.51	-307.46	-205.06	0.00	0.00	0.00	
1,500.00	25.00	300.00	1,425.40	198.65	-344.06	-229.47	0.00	0.00	0.00	
1,573.33	25.00	300.00	1,491.86	214.14	-370.90	-247.37	0.00	0.00	0.00	
1,600.00	23.67	300.00	1,516.16	219.64	-380.42	-253.72	5.00	-5.00	0.00	
1,700.00	18.67	300.00	1,609.38	237.68	-411.68	-274.57	5.00	-5.00	0.00	
1,719.59	17.69	300.00	1,628.00	240.74	-416.97	-278.10	5.00	-5.00	0.00	
<b>Lwr. Animas</b>										
1,773.33	15.00	300.00	1,679.56	248.30	-430.07	-286.83	5.00	-5.00	0.00	
1,800.00	13.72	301.50	1,705.40	251.68	-435.75	-290.58	5.00	-4.80	5.64	
1,900.00	9.05	310.80	1,803.41	263.02	-451.83	-300.44	5.00	-4.67	9.30	
2,000.00	5.06	336.55	1,902.65	272.22	-459.55	-303.60	5.00	-3.99	25.75	
2,100.00	4.38	40.10	2,002.38	279.19	-458.84	-300.05	5.00	-0.68	63.54	
2,128.72	5.15	54.74	2,031.00	280.77	-457.08	-297.79	5.00	2.70	50.98	
<b>Kirtland Sh</b>										
2,195.68	7.73	74.28	2,097.54	283.73	-450.29	-290.38	5.00	3.85	29.18	
<b>Harper Pilot</b>										
2,200.00	7.92	75.08	2,101.82	283.88	-449.72	-289.80	5.00	4.31	18.67	
2,250.82	10.19	82.31	2,152.00	285.39	-441.88	-282.05	5.00	4.48	14.23	
<b>Farmington Ss</b>										
2,300.00	12.49	86.76	2,200.22	286.27	-432.26	-272.94	5.00	4.68	9.04	
2,352.43	15.00	90.00	2,251.15	286.59	-419.81	-261.50	5.00	4.78	6.18	
2,400.00	18.68	90.00	2,296.67	286.59	-406.03	-248.98	7.73	7.73	0.00	
2,500.00	26.41	90.00	2,388.96	286.59	-367.72	-214.19	7.73	7.73	0.00	
2,600.00	34.14	90.00	2,475.25	286.59	-317.35	-168.43	7.73	7.73	0.00	
2,700.00	41.87	90.00	2,553.99	286.59	-255.82	-112.54	7.73	7.73	0.00	
2,714.92	43.02	90.00	2,565.00	286.59	-245.75	-103.39	7.73	7.73	0.00	
<b>Lwr. Kirtland Sh</b>										
2,800.00	49.60	90.00	2,623.73	286.59	-184.26	-47.53	7.73	7.73	0.00	
2,900.00	57.33	90.00	2,683.21	286.59	-103.97	25.40	7.73	7.73	0.00	
2,992.14	64.46	90.00	2,728.00	286.59	-23.52	98.48	7.73	7.73	0.00	
<b>Fruitland Coal</b>										
2,999.16	65.00	90.00	2,731.00	286.59	-17.16	104.25	7.73	7.73	0.00	
3,000.00	65.00	90.00	2,731.35	286.59	-16.41	104.94	0.00	0.00	0.00	
3,010.99	65.00	90.00	2,736.00	286.59	-6.44	113.99	0.00	0.00	0.00	



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<b>Well:</b>	Harper 01-18 2	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Pilot		
<b>Design:</b>	Plan #3		

**Planned 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)
<b>Bayfield</b>									
3,100.00	65.00	90.00	2,773.62	286.59	74.22	187.27	0.00	0.00	0.00
3,200.00	65.00	90.00	2,815.88	286.59	164.86	269.59	0.00	0.00	0.00
3,205.02	65.00	90.00	2,818.00	286.59	169.41	273.73	0.00	0.00	0.00
<b>Lemon</b>									
3,300.00	65.00	90.00	2,858.14	286.59	255.49	351.92	0.00	0.00	0.00
3,335.16	65.00	90.00	2,873.00	286.59	287.36	380.87	0.00	0.00	0.00
<b>Lower Lemon</b>									
3,400.00	65.00	90.00	2,900.40	286.59	346.12	434.24	0.00	0.00	0.00
3,481.87	65.00	90.00	2,935.00	286.59	420.31	501.64	0.00	0.00	0.00
<b>Pictured Cliffs</b>									
3,500.00	65.00	90.00	2,942.66	286.59	436.75	516.57	0.00	0.00	0.00
3,600.00	65.00	90.00	2,984.92	286.59	527.38	598.90	0.00	0.00	0.00
3,604.91	65.00	90.00	2,987.00	286.59	531.83	602.94	0.00	0.00	0.00
<b>Pictured Cliffs 3</b>									
3,700.00	65.00	90.00	3,027.19	286.59	618.01	681.22	0.00	0.00	0.00
3,705.00	65.00	90.00	3,029.30	286.59	622.54	685.34	0.00	0.00	0.00