

Anadarko Petroleum Corp.

Cheyenne County, CO (NAD 83)

Sec. 17-T16S-R47W

SWITCHMAN 1647-17-11-H

Plan A0

Plan: Plan A0 Permit

Sperry Drilling Services

Proposal Report

12 August, 2013

Well Coordinates: 1,312,586.07 N, 3,796,153.27 E (38° 39' 29.06" N, 102° 42' 41.46" W)

Ground Level: 4,185.00 ft

Local Coordinate Origin: Centered on Well SWITCHMAN 1647-17-11-H

Viewing Datum: KB = 15' @ 4200.00ft (Drilling Rig)

TVDs to System: N

North Reference: True

Unit System: API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 43I

HALLIBURTON

Project: Cheyenne County, CO (NAD 83)
Site: Sec. 17-T16S-R47W
Well: SWITCHMAN 1647-17-11-H
Wellbore: Plan A0
Design: Plan A0 Permit

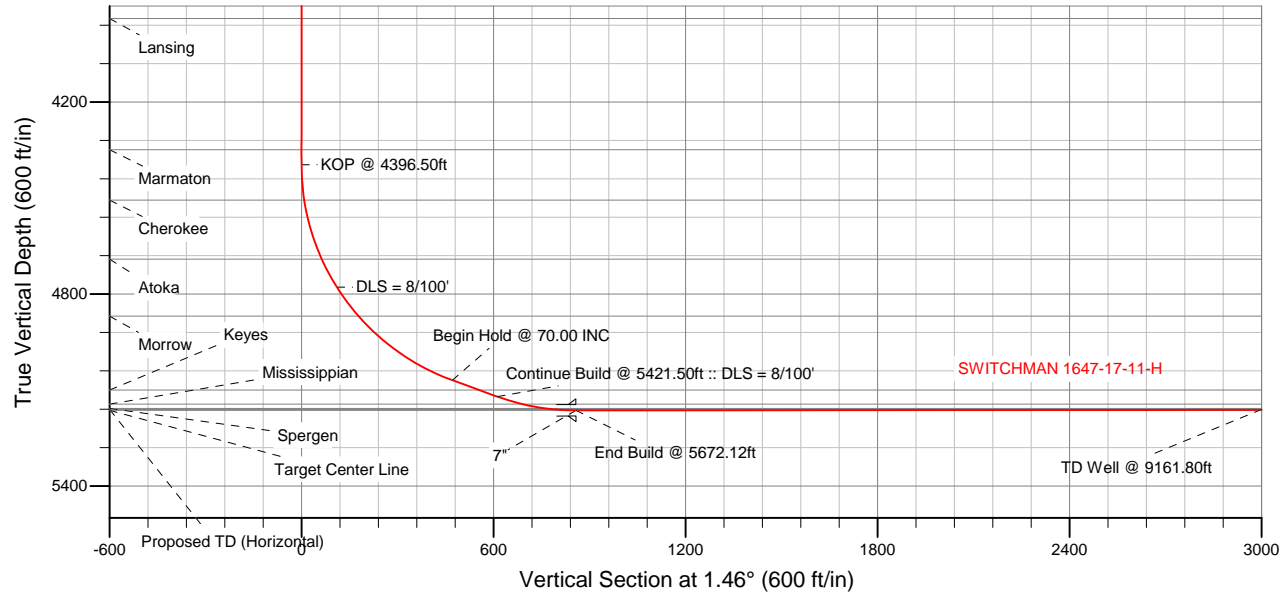


SECTION DETAILS

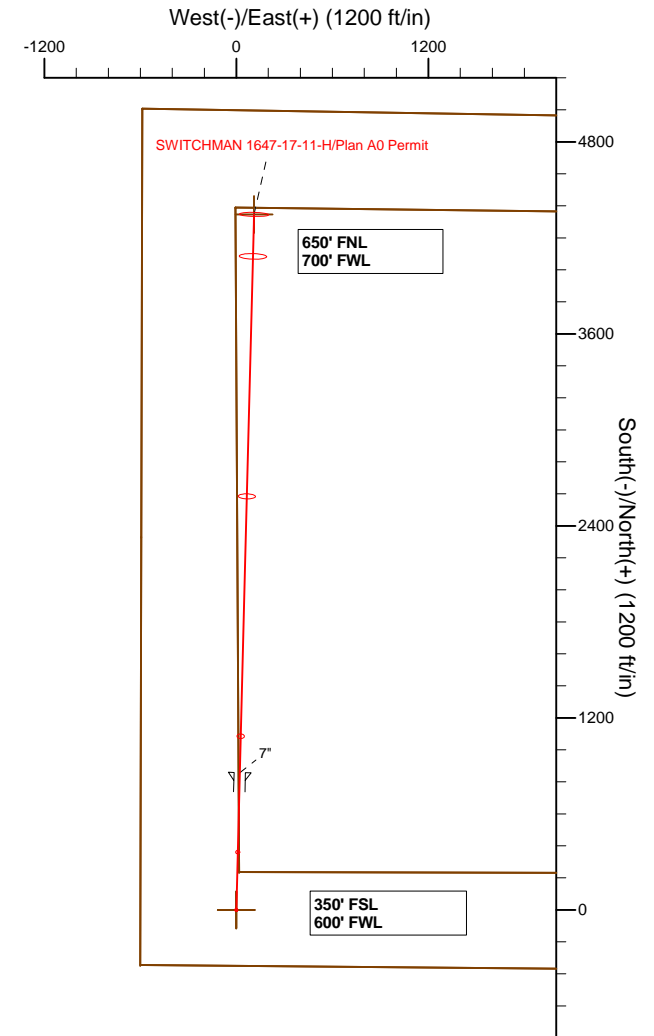
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	4396.50	0.00	0.00	4396.50	0.00	0.00	0.00	0.00	0.00	
3	5271.50	70.00	1.46	5069.51	471.09	12.01	8.00	1.46	471.24	
4	5421.50	70.00	1.46	5120.81	612.00	15.60	0.00	0.00	612.20	
5	5672.12	90.05	1.46	5164.00	857.49	21.87	8.00	0.01	857.77	
6	9161.80	90.05	1.46	5161.00	4346.03	111.07	0.00	0.00	4347.45	SWITCHMAN 1647-17-11-H_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
SWITCHMAN 1647-17-11-H_SB	0.00	0.00	0.00	38.658071	-102.711518	Polygon
SWITCHMAN 1647-17-11-H_SEC	0.00	0.00	0.00	38.658071	-102.711518	Polygon
SWITCHMAN 1647-17-11-H_SHL	0.00	0.00	0.00	38.658071	-102.711518	Point
SWITCHMAN 1647-17-11-H_BHL 5161.00	4346.03	111.07	38.670004	-102.711129	Point	



TVD	MD	
4396.50	4396.50	KOP @ 4396.50ft
4778.99	4800.00	DLS = 8/100'
5069.51	5271.50	Begin Hold @ 70.00 INC
5120.81	5421.50	Continue Build @ 5421.50ft :: DLS = 8/100'
5164.00	5672.12	End Build @ 5672.12ft
5161.00	9161.80	TD Well @ 9161.80ft



WELL DETAILS: SWITCHMAN 1647-17-11-H

Ground Level: 4185.00
KB = 15' @ 4200.00ft (Drilling Rig)

Plan: Plan A0 Permit (SWITCHMAN 1647-17-11-H/Plan A0)

Created By: Clint Eshelman Date: 08/09/2013

Plan Report for SWITCHMAN 1647-17-11-H - Plan A0 Permit

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)	Toolface Azimuth (°)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SWITCHMAN 1647-17-11-H_SB - SWITCHMAN 1647-17-11-H_SEC - SWITCHMAN 1647-17-11-H_SHL										
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185.00	0.00	0.00	185.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Niobrara										
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
741.00	0.00	0.00	741.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ft Hays Limestone										
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,222.00	0.00	0.00	1,222.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dakota Sandstone										
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,533.00	0.00	0.00	1,533.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cheyenne Sandstone										
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,302.00	0.00	0.00	2,302.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blaine Anhydrite										
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,451.00	0.00	0.00	2,451.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cedar Hills (Lyons) Sandstone										
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,603.00	0.00	0.00	2,603.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stone Corral Anhydrite										
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,275.00	0.00	0.00	3,275.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Neva Limestone										
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,726.00	0.00	0.00	3,726.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Shawnee										

Plan Report for SWITCHMAN 1647-17-11-H - Plan A0 Permit

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)	Toolface Azimuth (°)
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,939.00	0.00	0.00	3,939.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lansing										
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,349.00	0.00	0.00	4,349.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Marmaton										
4,396.50	0.00	0.00	4,396.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP @ 4396.50ft										
4,400.00	0.28	1.46	4,400.00	0.01	0.00	0.01	8.00	8.00	0.00	1.46
4,500.00	8.28	1.46	4,499.64	7.46	0.19	7.47	8.00	8.00	0.00	0.00
4,507.44	8.88	1.46	4,507.00	8.57	0.22	8.58	8.00	8.00	0.00	0.00
Cherokee										
4,600.00	16.28	1.46	4,597.27	28.71	0.73	28.72	8.00	8.00	0.00	0.00
4,700.00	24.28	1.46	4,691.00	63.33	1.61	63.35	8.00	8.00	0.00	0.00
Atoka										
4,800.00	32.28	1.46	4,778.99	110.65	2.82	110.69	8.00	8.00	0.00	0.00
DLS = 8/100'										
4,900.00	40.28	1.46	4,859.54	169.76	4.33	169.81	8.00	8.00	0.00	0.00
4,912.50	41.28	1.46	4,869.00	177.92	4.53	177.98	8.00	8.00	0.00	0.00
Morrow										
5,000.00	48.28	1.46	4,931.07	239.50	6.10	239.57	8.00	8.00	0.00	0.00
5,100.00	56.28	1.46	4,992.20	318.51	8.12	318.61	8.00	8.00	0.00	0.00
5,200.00	64.28	1.46	5,041.74	405.25	10.33	405.39	8.00	8.00	0.00	0.00
5,271.50	70.00	1.46	5,069.51	471.09	12.01	471.24	8.00	8.00	0.00	0.00
Begin Hold @ 70.00 INC										
5,300.00	70.00	1.46	5,079.25	497.86	12.69	498.02	0.00	0.00	0.00	0.00
5,360.66	70.00	1.46	5,100.00	554.85	14.14	555.03	0.00	0.00	0.00	0.00
Keyes										
5,400.00	70.00	1.46	5,113.45	591.80	15.08	591.99	0.00	0.00	0.00	0.00
5,421.50	70.00	1.46	5,120.81	612.00	15.60	612.20	0.00	0.00	0.00	0.00
Continue Build @ 5421.50ft :: DLS = 8/100'										
5,500.00	76.28	1.46	5,143.56	687.06	17.51	687.29	8.00	8.00	0.00	0.01
5,501.85	76.43	1.46	5,144.00	688.86	17.56	689.08	8.00	8.00	0.00	0.01
Mississippian										
5,578.73	82.58	1.46	5,158.00	764.39	19.49	764.64	8.00	8.00	0.00	0.01
Spergen										
5,600.00	84.28	1.46	5,160.43	785.51	20.03	785.77	8.00	8.00	0.00	0.01
5,672.12	90.05	1.46	5,164.00	857.49	21.87	857.77	8.00	8.00	0.00	0.01
End Build @ 5672.12ft - Target Center Line - 7"										
5,700.00	90.05	1.46	5,163.98	885.36	22.58	885.65	0.00	0.00	0.00	0.00
5,800.00	90.05	1.46	5,163.89	985.33	25.13	985.65	0.00	0.00	0.00	0.00
5,900.00	90.05	1.46	5,163.80	1,085.30	27.69	1,085.65	0.00	0.00	0.00	0.00
6,000.00	90.05	1.46	5,163.72	1,185.27	30.25	1,185.65	0.00	0.00	0.00	0.00
6,100.00	90.05	1.46	5,163.63	1,285.23	32.80	1,285.65	0.00	0.00	0.00	0.00
6,200.00	90.05	1.46	5,163.55	1,385.20	35.36	1,385.65	0.00	0.00	0.00	0.00
6,300.00	90.05	1.46	5,163.46	1,485.17	37.92	1,485.65	0.00	0.00	0.00	0.00
6,400.00	90.05	1.46	5,163.37	1,585.13	40.47	1,585.65	0.00	0.00	0.00	0.00
6,500.00	90.05	1.46	5,163.29	1,685.10	43.03	1,685.65	0.00	0.00	0.00	0.00
6,600.00	90.05	1.46	5,163.20	1,785.07	45.58	1,785.65	0.00	0.00	0.00	0.00
6,700.00	90.05	1.46	5,163.12	1,885.04	48.14	1,885.65	0.00	0.00	0.00	0.00
6,800.00	90.05	1.46	5,163.03	1,985.00	50.70	1,985.65	0.00	0.00	0.00	0.00
6,900.00	90.05	1.46	5,162.94	2,084.97	53.25	2,085.65	0.00	0.00	0.00	0.00
7,000.00	90.05	1.46	5,162.86	2,184.94	55.81	2,185.65	0.00	0.00	0.00	0.00
7,100.00	90.05	1.46	5,162.77	2,284.91	58.36	2,285.65	0.00	0.00	0.00	0.00

Plan Report for SWITCHMAN 1647-17-11-H - Plan A0 Permit

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)	Toolface Azimuth (°)
7,200.00	90.05	1.46	5,162.69	2,384.87	60.92	2,385.65	0.00	0.00	0.00	0.00
7,300.00	90.05	1.46	5,162.60	2,484.84	63.48	2,485.65	0.00	0.00	0.00	0.00
7,400.00	90.05	1.46	5,162.51	2,584.81	66.03	2,585.65	0.00	0.00	0.00	0.00
7,500.00	90.05	1.46	5,162.43	2,684.77	68.59	2,685.65	0.00	0.00	0.00	0.00
7,600.00	90.05	1.46	5,162.34	2,784.74	71.15	2,785.65	0.00	0.00	0.00	0.00
7,700.00	90.05	1.46	5,162.26	2,884.71	73.70	2,885.65	0.00	0.00	0.00	0.00
7,800.00	90.05	1.46	5,162.17	2,984.68	76.26	2,985.65	0.00	0.00	0.00	0.00
7,900.00	90.05	1.46	5,162.08	3,084.64	78.81	3,085.65	0.00	0.00	0.00	0.00
8,000.00	90.05	1.46	5,162.00	3,184.61	81.37	3,185.65	0.00	0.00	0.00	0.00
8,100.00	90.05	1.46	5,161.91	3,284.58	83.93	3,285.65	0.00	0.00	0.00	0.00
8,200.00	90.05	1.46	5,161.83	3,384.55	86.48	3,385.65	0.00	0.00	0.00	0.00
8,300.00	90.05	1.46	5,161.74	3,484.51	89.04	3,485.65	0.00	0.00	0.00	0.00
8,400.00	90.05	1.46	5,161.65	3,584.48	91.60	3,585.65	0.00	0.00	0.00	0.00
8,500.00	90.05	1.46	5,161.57	3,684.45	94.15	3,685.65	0.00	0.00	0.00	0.00
8,600.00	90.05	1.46	5,161.48	3,784.41	96.71	3,785.65	0.00	0.00	0.00	0.00
8,700.00	90.05	1.46	5,161.40	3,884.38	99.26	3,885.65	0.00	0.00	0.00	0.00
8,800.00	90.05	1.46	5,161.31	3,984.35	101.82	3,985.65	0.00	0.00	0.00	0.00
8,900.00	90.05	1.46	5,161.23	4,084.32	104.38	4,085.65	0.00	0.00	0.00	0.00
9,000.00	90.05	1.46	5,161.14	4,184.28	106.93	4,185.65	0.00	0.00	0.00	0.00
9,100.00	90.05	1.46	5,161.05	4,284.25	109.49	4,285.65	0.00	0.00	0.00	0.00
9,161.80	90.05	1.46	5,161.00	4,346.03	111.07	4,347.45	0.00	0.00	0.00	0.00

TD Well @ 9161.80ft - Proposed TD (Horizontal) - SWITCHMAN 1647-17-11-H_BHL

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	+E/-W (ft)	Comment
4,396.50	4,396.50	0.00	0.00	KOP @ 4396.50ft
4,800.00	4,778.99	110.65	2.82	DLS = 8/100'
5,271.50	5,069.51	471.09	12.01	Begin Hold @ 70.00 INC
5,421.50	5,120.81	612.00	15.60	Continue Build @ 5421.50ft :: DLS = 8/100'
5,672.12	5,164.00	857.49	21.87	End Build @ 5672.12ft
9,161.80	5,161.00	4,346.03	111.07	TD Well @ 9161.80ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (ft)	+E/-W (ft)	Start TVD (ft)
User	No Target (Freehand)	1.46	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	5,672.12	Plan A0 Permit	MWD
5,672.12	9,161.80	Plan A0 Permit	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
5,672.12	5,164.00	7"	7	8-3/4

Plan Report for SWITCHMAN 1647-17-11-H - Plan A0 Permit**Formation Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
185.00	185.00	Niobrara		0.00	
741.00	741.00	Ft Hays Limestone		0.00	
1,222.00	1,222.00	Dakota Sandstone		0.00	
1,533.00	1,533.00	Cheyenne Sandstone		0.00	
2,302.00	2,302.00	Blaine Anhydrite		0.00	
2,451.00	2,451.00	Cedar Hills (Lyons) Sandstone		0.00	
2,603.00	2,603.00	Stone Corral Anhydrite		0.00	
3,275.00	3,275.00	Neva Limestone		0.00	
3,726.00	3,726.00	Shawnee		0.00	
3,939.00	3,939.00	Lansing		0.00	
4,349.00	4,349.00	Marmaton		0.00	
4,507.44	4,507.00	Cherokee		0.00	
4,700.00	4,691.00	Atoka		0.00	
4,912.50	4,869.00	Morrow		0.00	
5,360.66	5,100.00	Keyes		0.00	
5,501.85	5,144.00	Mississippian		0.00	
5,578.73	5,158.00	Spergen		0.00	
5,672.12	5,164.00	Target Center Line		0.00	
9,161.80	5,161.00	Proposed TD (Horizontal)		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
SWITCHMAN 1647-17-11-H_BHL	5,161.00	4,346.03	111.07	Point
SWITCHMAN 1647-17-11-H_SEC	0.00	0.00	0.00	Polygon
SWITCHMAN 1647-17-11-H_SHL	0.00	0.00	0.00	Point
SWITCHMAN 1647-17-11-H_SB	0.00	0.00	0.00	Polygon

North Reference Sheet for Sec. 17-T16S-R47W - SWITCHMAN 1647-17-11-H - Plan A0

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.
Vertical Depths are relative to KB = 15' @ 4200.00ft (Drilling Rig). Northing and Easting are relative to SWITCHMAN 1647-17-11-H
Coordinate System is US State Plane 1983, Colorado Central Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)
Central Meridian is -105.50°, Longitude Origin:0.000000°, Latitude Origin:39.750000°
False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99996561

Grid Coordinates of Well: 1,312,586.07 ft N, 3,796,153.27 ft E
Geographical Coordinates of Well: 38° 39' 29.06" N, 102° 42' 41.46" W
Grid Convergence at Surface is: 1.76°

Based upon Minimum Curvature type calculations, at a Measured Depth of 9,161.80ft
the Bottom Hole Displacement is 4,347.45ft in the Direction of 1.46° (True).

Magnetic Convergence at surface is: -5.65° (12 August 2013, , BGGM2013)

