

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 33-T2N-R65W

Gittlein 4C-28HZX

Plan B Sidetrack Permit

Plan: Permit B0

Sperry Drilling Services

Proposal Report

22 October, 2013

Well Coordinates: 1,276,080.36 N, 3,231,105.38 E (40° 05' 17.80" N, 104° 40' 26.38" W)

Ground Level: 4,917.00 usft

Local Coordinate Origin:

Centered on Well Gittlein 4C-28HZX

Viewing Datum:

RKB = 25' @ 4942.00usft (H&P 308)

TVDs to System:

N

North Reference:

True

Unit System:

Dec-Deg - API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

HALLIBURTON

Project: Weld County, CO (NAD 83)
 Site: Sec. 33-T2N-R65W
 Well: Gittlein 4C-28HZX
 Wellbore: Plan B Sidetrack Permit
 Design: Permit B0

Anadarko Petroleum Corp.

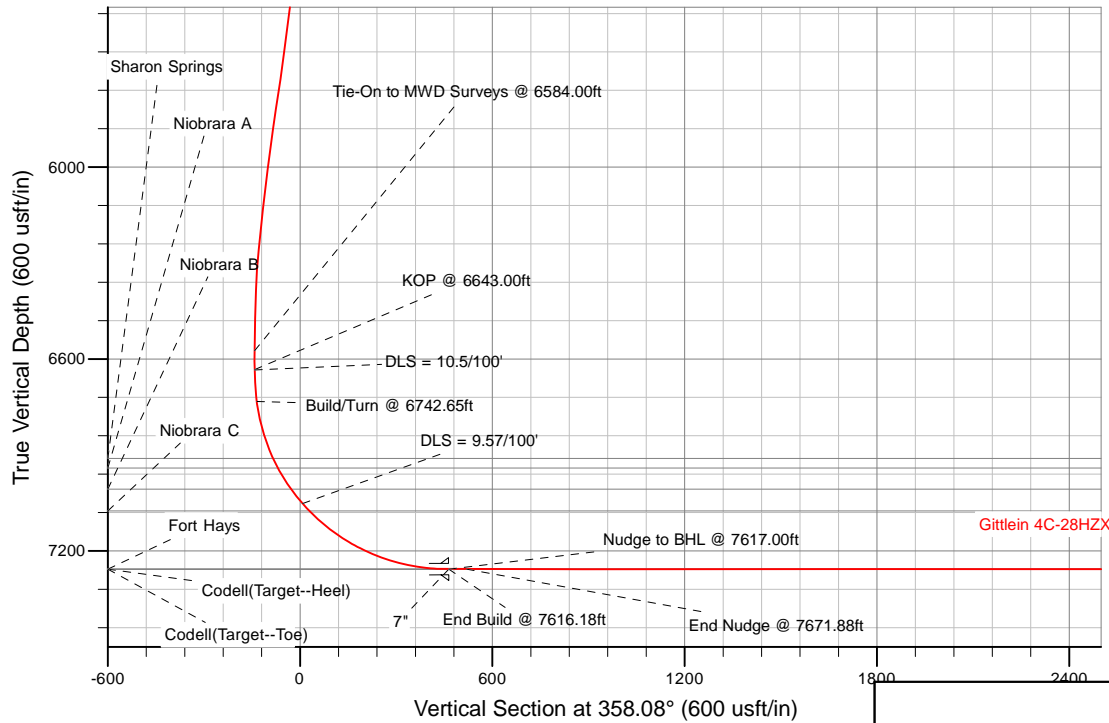
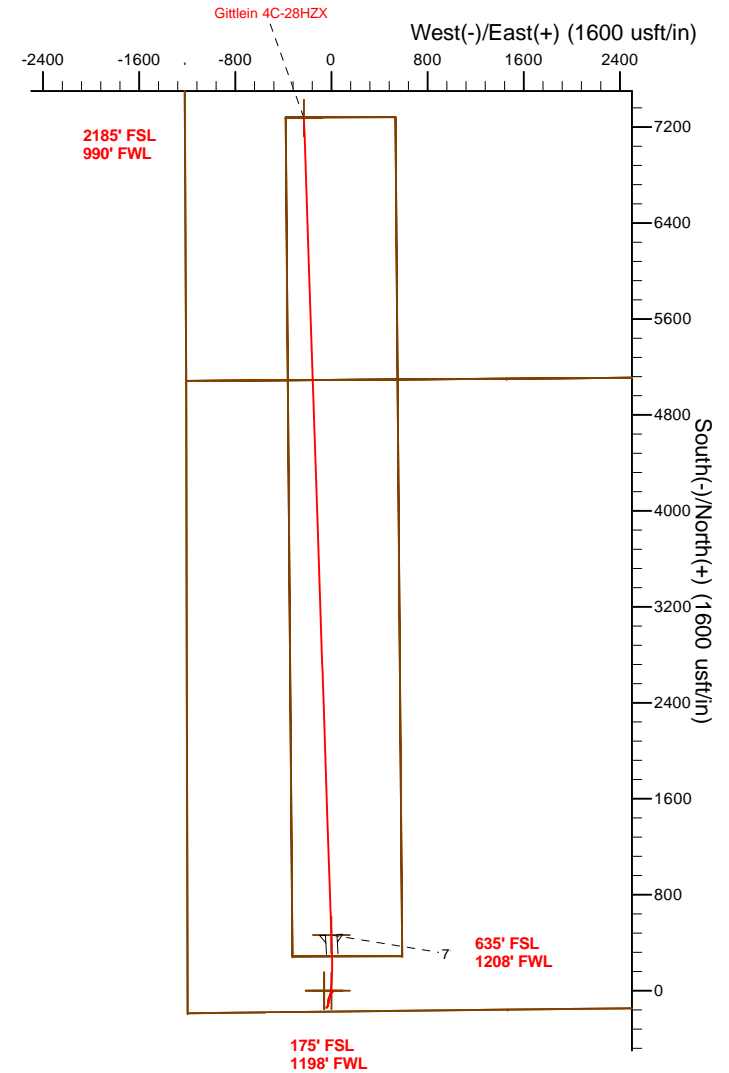


SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	6584.00	1.88	260.87	6574.43	-143.65	-41.79	0.00	0.00	-142.17	
2	6643.00	1.85	305.54	6633.40	-143.25	-43.52	2.40	113.45	-141.71	
3	6742.65	10.00	45.00	6732.54	-136.18	-38.70	10.50	109.40	-134.80	
4	7616.18	90.29	357.01	7257.00	464.15	-0.88	9.57	-48.39	463.92	Gittlein 4C-28HZ_Landing
5	7671.88	90.00	358.09	7256.86	519.80	-3.26	2.00	105.31	519.62	
6	14431.50	90.00	358.09	7257.00	7275.65	-229.09	0.00	0.00	7279.24	Gittlein 4C-28HZ_BHL

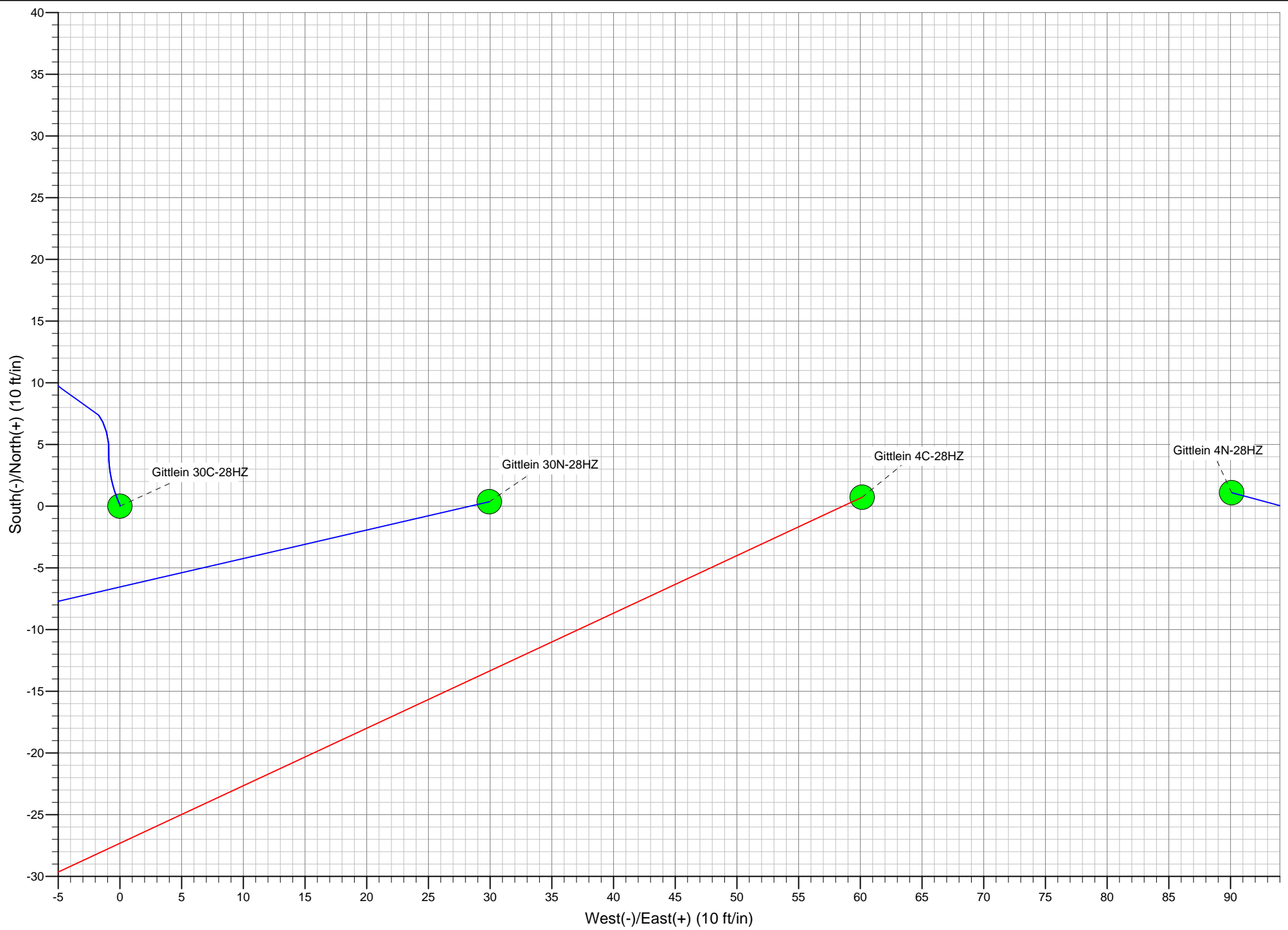
WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	
Gittlein 4C-28HZ_LD	0.00	-0.72	-60.16	40.088275	-104.674210	
Gittlein 4C-28HZ_Sec	0.00	-0.72	-60.16	40.088275	-104.674210	Polygon
Gittlein 4C-28HZ_SHL	0.00	0.00	0.00	40.088277	-104.673995	
Gittlein 4C-28HZ_BHL	7257.00	7275.65	-229.09	40.108249	-104.674814	
Gittlein 4C-28HZ_Landing	7257.00	464.15	-0.88	40.089551	-104.673998	Point



TVD	MD	Target
6633.40	6643.00	KOP @ 6643.00ft

WELL DETAILS: Gittlein 4C-28HZX	
Ground Level:	4917.00
RKB = 25' @ 4942.00usft (H&P 308)	
Plan: Permit B0 (Gittlein 4C-28HZX/Plan B Sidetrack Permit)	
Created By: Clint Eshelman	Date: 10/22/2013
Reviewed: _____	Date: _____



Plan Report for Gittlein 4C-28HZX - Permit B0

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)	Toolface Azimuth (°)
6,584.00	1.88	260.87	6,574.43	-143.65	-41.79	-142.17	0.00	0.00	0.00	0.00
Tie-On to MWD Surveys @ 6584.00ft - Gittlein 4C-28HZ_SHL - Gittlein 4C-28HZ_LD - Gittlein 4C-28HZ_Sec										
6,600.00	1.76	272.41	6,590.42	-143.68	-42.30	-142.18	2.40	-0.73	72.15	113.45
6,643.00	1.85	305.54	6,633.40	-143.25	-43.52	-141.71	2.40	0.20	77.04	101.91
KOP @ 6643.00ft										
6,644.00	1.82	308.66	6,634.40	-143.23	-43.55	-141.69	10.50	-3.22	312.37	109.40
DLS = 10.5/100'										
6,700.00	5.65	37.00	6,690.30	-140.47	-42.58	-138.97	10.50	6.84	157.74	106.28
6,742.65	10.00	45.00	6,732.54	-136.18	-38.70	-134.80	10.50	10.21	18.76	18.03
Build/Turn @ 6742.65ft										
6,800.00	14.24	28.10	6,788.62	-126.42	-31.85	-125.28	9.57	7.40	-29.47	-48.39
6,900.00	22.93	15.08	6,883.35	-96.69	-20.96	-95.94	9.57	8.68	-13.02	-31.85
6,930.34	25.68	12.85	6,911.00	-84.58	-17.96	-83.93	9.57	9.08	-7.36	-19.47
Sharon Springs										
6,964.08	28.78	10.84	6,941.00	-69.47	-14.81	-68.93	9.57	9.18	-5.95	-17.43
Niobrara A										
7,000.00	32.10	9.10	6,971.96	-51.55	-11.67	-51.13	9.57	9.25	-4.86	-15.64
7,042.31	36.04	7.42	7,007.00	-28.10	-8.29	-27.80	9.57	9.31	-3.97	-14.14
Niobrara B										
7,100.00	41.44	5.58	7,051.98	7.77	-4.24	7.90	9.57	9.36	-3.19	-12.75
DLS = 9.57/100'										
7,131.43	44.40	4.73	7,075.00	29.08	-2.32	29.14	9.57	9.40	-2.68	-11.31
Niobrara C										
7,200.00	50.86	3.17	7,121.19	79.59	1.14	79.51	9.57	9.42	-2.29	-10.69
7,300.00	60.31	1.33	7,177.65	161.92	4.29	161.69	9.57	9.45	-1.84	-9.64
7,400.00	69.78	359.81	7,219.79	252.48	5.15	252.16	9.57	9.47	-1.52	-8.59
7,500.00	79.27	358.47	7,246.45	348.73	3.69	348.41	9.57	9.48	-1.34	-7.95
7,600.00	88.76	357.21	7,256.87	448.00	-0.06	447.75	9.57	9.49	-1.26	-7.59
7,616.18	90.29	357.01	7,257.00	464.15	-0.88	463.92	9.57	9.49	-1.24	-7.46
End Build @ 7616.18ft - Fort Hays - Codell(Target-Heel) - 7" - Gittlein 4C-28HZ_Landing										
7,617.00	90.29	357.03	7,257.00	464.97	-0.92	464.74	2.00	-0.52	1.93	105.07
Nudge to BHL @ 7617.00ft										
7,671.88	90.00	358.09	7,256.86	519.80	-3.26	519.62	2.00	-0.53	1.93	105.31
End Nudge @ 7671.88ft										
7,700.00	90.00	358.09	7,256.86	547.91	-4.20	547.74	0.00	0.00	0.00	0.00
7,800.00	90.00	358.09	7,256.86	647.85	-7.54	647.74	0.00	0.00	0.00	0.00
7,900.00	90.00	358.09	7,256.86	747.80	-10.88	747.74	0.00	0.00	0.00	0.00
8,000.00	90.00	358.09	7,256.87	847.74	-14.22	847.74	0.00	0.00	0.00	0.00
8,100.00	90.00	358.09	7,256.87	947.68	-17.57	947.74	0.00	0.00	0.00	0.00
8,200.00	90.00	358.09	7,256.87	1,047.63	-20.91	1,047.74	0.00	0.00	0.00	0.00
8,300.00	90.00	358.09	7,256.87	1,147.57	-24.25	1,147.74	0.00	0.00	0.00	0.00
8,400.00	90.00	358.09	7,256.87	1,247.52	-27.59	1,247.74	0.00	0.00	0.00	0.00
8,500.00	90.00	358.09	7,256.88	1,347.46	-30.93	1,347.74	0.00	0.00	0.00	0.00
8,600.00	90.00	358.09	7,256.88	1,447.40	-34.27	1,447.74	0.00	0.00	0.00	0.00
8,700.00	90.00	358.09	7,256.88	1,547.35	-37.61	1,547.74	0.00	0.00	0.00	0.00
8,800.00	90.00	358.09	7,256.88	1,647.29	-40.95	1,647.74	0.00	0.00	0.00	0.00
8,900.00	90.00	358.09	7,256.88	1,747.24	-44.29	1,747.74	0.00	0.00	0.00	0.00
9,000.00	90.00	358.09	7,256.89	1,847.18	-47.63	1,847.74	0.00	0.00	0.00	0.00
9,100.00	90.00	358.09	7,256.89	1,947.13	-50.97	1,947.74	0.00	0.00	0.00	0.00
9,200.00	90.00	358.09	7,256.89	2,047.07	-54.31	2,047.74	0.00	0.00	0.00	0.00
9,300.00	90.00	358.09	7,256.89	2,147.01	-57.66	2,147.74	0.00	0.00	0.00	0.00
9,400.00	90.00	358.09	7,256.89	2,246.96	-61.00	2,247.74	0.00	0.00	0.00	0.00
9,500.00	90.00	358.09	7,256.90	2,346.90	-64.34	2,347.74	0.00	0.00	0.00	0.00
9,600.00	90.00	358.09	7,256.90	2,446.85	-67.68	2,447.74	0.00	0.00	0.00	0.00
9,700.00	90.00	358.09	7,256.90	2,546.79	-71.02	2,547.74	0.00	0.00	0.00	0.00
9,800.00	90.00	358.09	7,256.90	2,646.73	-74.36	2,647.74	0.00	0.00	0.00	0.00
9,900.00	90.00	358.09	7,256.90	2,746.68	-77.70	2,747.74	0.00	0.00	0.00	0.00

Plan Report for Gittlein 4C-28HZX - Permit B0

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)	Toolface Azimuth (°)
10,000.00	90.00	358.09	7,256.91	2,846.62	-81.04	2,847.74	0.00	0.00	0.00	0.00
10,100.00	90.00	358.09	7,256.91	2,946.57	-84.38	2,947.74	0.00	0.00	0.00	0.00
10,200.00	90.00	358.09	7,256.91	3,046.51	-87.72	3,047.74	0.00	0.00	0.00	0.00
10,300.00	90.00	358.09	7,256.91	3,146.46	-91.06	3,147.74	0.00	0.00	0.00	0.00
10,400.00	90.00	358.09	7,256.92	3,246.40	-94.40	3,247.74	0.00	0.00	0.00	0.00
10,500.00	90.00	358.09	7,256.92	3,346.34	-97.75	3,347.74	0.00	0.00	0.00	0.00
10,521.90	90.00	358.09	7,256.92	3,368.23	-98.48	3,369.64	0.00	0.00	0.00	0.00
Gittlein 4C-28HZ_Lat. Tgt										
10,600.00	90.00	358.09	7,256.92	3,446.29	-101.09	3,447.74	0.00	0.00	0.00	0.00
10,700.00	90.00	358.09	7,256.92	3,546.23	-104.43	3,547.74	0.00	0.00	0.00	0.00
10,800.00	90.00	358.09	7,256.92	3,646.18	-107.77	3,647.74	0.00	0.00	0.00	0.00
10,900.00	90.00	358.09	7,256.93	3,746.12	-111.11	3,747.74	0.00	0.00	0.00	0.00
11,000.00	90.00	358.09	7,256.93	3,846.07	-114.45	3,847.74	0.00	0.00	0.00	0.00
11,100.00	90.00	358.09	7,256.93	3,946.01	-117.79	3,947.74	0.00	0.00	0.00	0.00
11,200.00	90.00	358.09	7,256.93	4,045.95	-121.13	4,047.74	0.00	0.00	0.00	0.00
11,300.00	90.00	358.09	7,256.93	4,145.90	-124.47	4,147.74	0.00	0.00	0.00	0.00
11,400.00	90.00	358.09	7,256.94	4,245.84	-127.81	4,247.74	0.00	0.00	0.00	0.00
11,500.00	90.00	358.09	7,256.94	4,345.79	-131.15	4,347.74	0.00	0.00	0.00	0.00
11,600.00	90.00	358.09	7,256.94	4,445.73	-134.49	4,447.74	0.00	0.00	0.00	0.00
11,700.00	90.00	358.09	7,256.94	4,545.67	-137.84	4,547.74	0.00	0.00	0.00	0.00
11,800.00	90.00	358.09	7,256.94	4,645.62	-141.18	4,647.74	0.00	0.00	0.00	0.00
11,900.00	90.00	358.09	7,256.95	4,745.56	-144.52	4,747.74	0.00	0.00	0.00	0.00
12,000.00	90.00	358.09	7,256.95	4,845.51	-147.86	4,847.74	0.00	0.00	0.00	0.00
12,100.00	90.00	358.09	7,256.95	4,945.45	-151.20	4,947.74	0.00	0.00	0.00	0.00
12,200.00	90.00	358.09	7,256.95	5,045.40	-154.54	5,047.74	0.00	0.00	0.00	0.00
12,300.00	90.00	358.09	7,256.96	5,145.34	-157.88	5,147.74	0.00	0.00	0.00	0.00
12,400.00	90.00	358.09	7,256.96	5,245.28	-161.22	5,247.74	0.00	0.00	0.00	0.00
12,500.00	90.00	358.09	7,256.96	5,345.23	-164.56	5,347.74	0.00	0.00	0.00	0.00
12,600.00	90.00	358.09	7,256.96	5,445.17	-167.90	5,447.74	0.00	0.00	0.00	0.00
12,700.00	90.00	358.09	7,256.96	5,545.12	-171.24	5,547.74	0.00	0.00	0.00	0.00
12,800.00	90.00	358.09	7,256.97	5,645.06	-174.58	5,647.74	0.00	0.00	0.00	0.00
12,900.00	90.00	358.09	7,256.97	5,745.00	-177.93	5,747.74	0.00	0.00	0.00	0.00
13,000.00	90.00	358.09	7,256.97	5,844.95	-181.27	5,847.74	0.00	0.00	0.00	0.00
13,100.00	90.00	358.09	7,256.97	5,944.89	-184.61	5,947.74	0.00	0.00	0.00	0.00
13,200.00	90.00	358.09	7,256.97	6,044.84	-187.95	6,047.74	0.00	0.00	0.00	0.00
13,300.00	90.00	358.09	7,256.98	6,144.78	-191.29	6,147.74	0.00	0.00	0.00	0.00
13,400.00	90.00	358.09	7,256.98	6,244.73	-194.63	6,247.74	0.00	0.00	0.00	0.00
13,500.00	90.00	358.09	7,256.98	6,344.67	-197.97	6,347.74	0.00	0.00	0.00	0.00
13,600.00	90.00	358.09	7,256.98	6,444.61	-201.31	6,447.74	0.00	0.00	0.00	0.00
13,700.00	90.00	358.09	7,256.98	6,544.56	-204.65	6,547.74	0.00	0.00	0.00	0.00
13,800.00	90.00	358.09	7,256.99	6,644.50	-207.99	6,647.74	0.00	0.00	0.00	0.00
13,900.00	90.00	358.09	7,256.99	6,744.45	-211.33	6,747.74	0.00	0.00	0.00	0.00
14,000.00	90.00	358.09	7,256.99	6,844.39	-214.67	6,847.74	0.00	0.00	0.00	0.00
14,100.00	90.00	358.09	7,256.99	6,944.33	-218.02	6,947.74	0.00	0.00	0.00	0.00
14,200.00	90.00	358.09	7,257.00	7,044.28	-221.36	7,047.74	0.00	0.00	0.00	0.00
14,300.00	90.00	358.09	7,257.00	7,144.22	-224.70	7,147.74	0.00	0.00	0.00	0.00
14,400.00	90.00	358.09	7,257.00	7,244.17	-228.04	7,247.74	0.00	0.00	0.00	0.00
14,431.50	90.00	358.09	7,257.00	7,275.65	-229.09	7,279.24	0.00	0.00	0.00	0.00
TD Well @ 14431.50ft - Codell(Target--Toe) - Gittlein 4C-28HZ_BHL										

Plan Report for Gittlein 4C-28HZX - Permit B0**Plan Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6,584.00	6,574.43	-143.65	-41.79	Tie-On to MWD Surveys @ 6584.00ft
6,643.00	6,633.40	-143.25	-43.52	KOP @ 6643.00ft
6,644.00	6,634.40	-143.23	-43.55	DLS = 10.5/100'
6,742.65	6,732.54	-136.18	-38.70	Build/Turn @ 6742.65ft
7,100.00	7,051.98	7.77	-4.24	DLS = 9.57/100'
7,616.18	7,257.00	464.15	-0.88	End Build @ 7616.18ft
7,617.00	7,257.00	464.97	-0.92	Nudge to BHL @ 7617.00ft
7,671.88	7,256.86	519.80	-3.26	End Nudge @ 7671.88ft
14,431.50	7,257.00	7,275.65	-229.09	TD Well @ 14431.50ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	358.08	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
25.00	1,225.00	Lightning Gyro Surveys	NS-GYRO-MS
1,485.00	6,584.00	MWD Vertical Surveys	MWD+IFR1+SC
6,584.00	7,616.18	Permit B0	MWD+IFR1+SC
7,616.18	14,431.50	Permit B0	MWD+IFR1+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
7,616.18	7,257.00	7"	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,930.34	6,911.00	Sharon Springs		0.00	
6,964.08	6,941.00	Niobrara A		0.00	
7,042.31	7,007.00	Niobrara B		0.00	
7,131.43	7,075.00	Niobrara C		0.00	
7,616.18	7,257.00	Fort Hays		0.00	
7,616.18	7,257.00	Codell(Target-Heel)		0.00	
14,431.50	7,257.00	Codell(Target-Toe)		0.00	

Plan Report for Gittlein 4C-28HZX - Permit B0

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
Gittlein 4C-28HZ_SHL	0.00	0.00	0.00	Point
Gittlein 4C-28HZ_LD	0.00	-0.72	-60.16	Polygon
Gittlein 4C-28HZ_Sec	0.00	-0.72	-60.16	Polygon
Gittlein 4C-28HZ_Landing	7,257.00	464.15	-0.88	Point
Gittlein 4C-28HZ_Lat. Tgt	7,257.00	3,369.84	-50.12	Point
Gittlein 4C-28HZ_BHL	7,257.00	7,275.65	-229.09	Point

Directional Difficulty Index

Average Dogleg over Survey:	1.23 °/100usft	Maximum Dogleg over Survey:	10.50 °/100usft at 6,742.65 usft
Net Tortousity applicable to Plans:	1.23 °/100usft	Directional Difficulty Index:	6.416

Audit Info

**North Reference Sheet for Sec. 33-T2N-R65W - Gittlein 4C-28HZX - Plan B
Sidetrack Permit**

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.
Vertical Depths are relative to RKB = 25' @ 4942.00usft (H&P 308). Northing and Easting are relative to Gittlein 4C-28HZX
Coordinate System is US State Plane 1983, Colorado Northern 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:40.783333°
False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99996085

Grid Coordinates of Well: 1,276,080.36 usft N, 3,231,105.38 usft E
Geographical Coordinates of Well: 40° 05' 17.80" N, 104° 40' 26.38" W
Grid Convergence at Surface is: 0.53°

Based upon Minimum Curvature type calculations, at a Measured Depth of 14,431.50usft
the Bottom Hole Displacement is 7,279.26usft in the Direction of 358.20° (True).

Magnetic Convergence at surface is: -7.97° (21 October 2013, , BGGM2013)

Magnetic Model: BGGM2013
Date: 21-Oct-13
Declination: 8.51°
Inclination/Dip: 66.72°
Field Strength: 52654

Grid North is 0.53° East of True North (Grid Convergence)
Magnetic North is 8.51° East of True North (Magnetic Declination)
Magnetic North is 7.97° East of Grid North (Magnetic Convergence)

To convert a True Direction to a Grid Direction, Subtract 0.53°
To convert a Magnetic Direction to a True Direction, Add 8.51° East
To convert a Magnetic Direction to a Grid Direction, Add 7.97°