

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N
Wilson Ranch 16-26HZ Pad
WHISPER ROCK 9N-25HZ

Plan A

Plan: Permit Rev-1

Sperry Drilling Services Proposal Report

05 December, 2014

Well Coordinates: 14,628,305.70 N, 1,651,023.27 E (40° 16' 44.13" N, 104° 57' 43.10" W)

Ground Level: 5,074.00 usft

Local Coordinate Origin:	Centered on Well WHISPER ROCK 9N-25HZ
Viewing Datum:	RKB = 17' @ 5091.00usft (Drilling Rig)
TVDs to System:	N
North Reference:	True
Unit System:	Dec-Deg - API - US Survey Feet - Custom

Version: 5000.1 Build: 70

HALLIBURTON

Project: WELD-NAD83-UTMFT13N
 Site: Wilson Ranch 16-26HZ Pad
 Well: WHISPER ROCK 9N-25HZ
 Wellbore: Plan A
 Design: Permit Rev-1

US ROCKIES WATTENBERG PLANNING

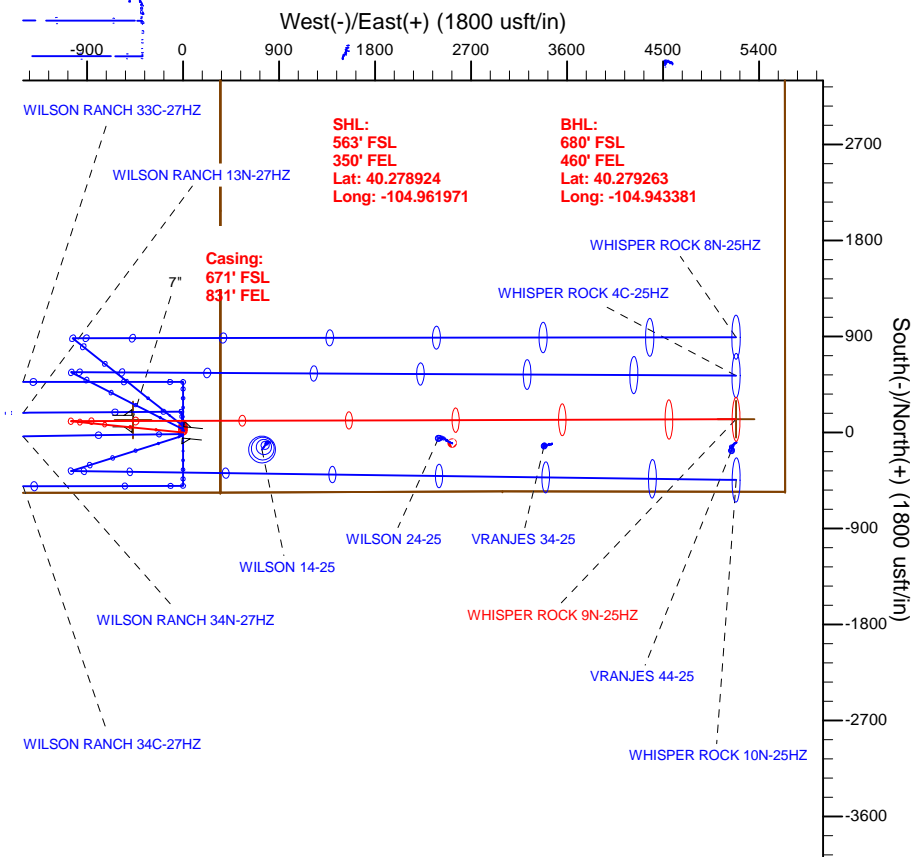
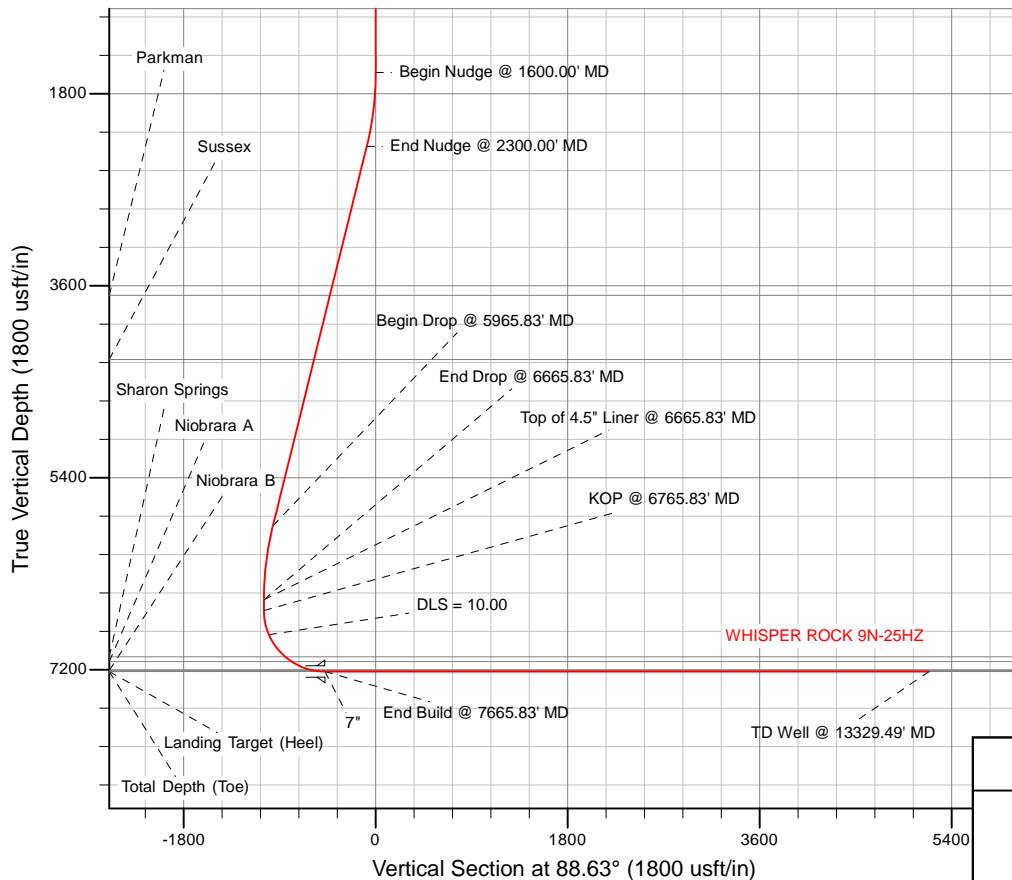


SECTION DETAILS

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	1600.00	0.00	0.00	1600.00	0.00	0.00	0.00	0.00	0.00	
3	2300.00	14.00	275.75	2293.06	8.53	-84.67	2.00	275.75	-84.44	
4	5965.83	14.00	275.75	5849.99	97.38	-967.05	0.00	0.00	-964.45	
5	6665.83	0.00	0.00	6543.05	105.90	-1051.72	2.00	180.00	-1048.89	
6	6765.83	0.00	0.00	6643.05	105.90	-1051.72	0.00	0.00	-1048.89	
7	7665.83	90.00	89.83	7216.00	107.56	-478.76	10.00	89.83	-476.05	
8	13329.49	90.00	89.83	7216.00	123.99	5184.88	0.00	0.00	5186.36	WHISPER ROCK 9N-25HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N-/S	+E-/W	Latitude	Longitude	Shape
4N-R68W-Sec. 25_Section Lines	122.00	4066.56	-409.93	40.290091	-104.963441	Polygon
4N-R68W-Sec. 26_Section Lines	122.00	4066.56	-409.93	40.290091	-104.963441	Polygon
WHISPER ROCK 9N-25HZ_BHL	7216.00	123.99	5184.88	40.279263	-104.943381	Point
WHISPER ROCK 9N-25HZ_Heel	7216.00	117.00	-470.00	40.279245	-104.963656	Point



TVD	MD	Annotation
6543.05	6665.83	Top of 4.5" Liner @ 6665.83' MD
6643.05	6765.83	KOP @ 6765.83' MD

WELL DETAILS: WHISPER ROCK 9N-25HZ	
Ground Level:	5074.00
RKB = 17' @ 5091.00usft (Drilling Rig)	
Plan: Permit Rev-1 (WHISPER ROCK 9N-25HZ/Plan A)	
Created By: Katie Benner	Date: 12/5/2014
Reviewed:	Date:



Plan Report for WHISPER ROCK 9N-25HZ - Permit Rev-1

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 (°)
0.00	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	0.00
122.00	0.00	0.00	122.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4N-R68W-Sec. 26_Section Lines - 4N-R68W-Sec. 25_Section Lines										
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
503.00	0.00	0.00	503.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Base Fox Hills										
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
754.00	0.00	0.00	754.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"										
788.00	0.00	0.00	788.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Surface Csg Setting Depth										
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
1,300.00	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
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 1600.00' MD										
1,700.00	2.00	275.75	1,699.98	0.17	-1.74	-1.73	2.00	2.00	0.00	275.75
1,800.00	4.00	275.75	1,799.84	0.70	-6.94	-6.92	2.00	2.00	0.00	0.00
1,900.00	6.00	275.75	1,899.45	1.57	-15.61	-15.57	2.00	2.00	0.00	0.00
2,000.00	8.00	275.75	1,998.70	2.79	-27.74	-27.66	2.00	2.00	0.00	0.00
2,100.00	10.00	275.75	2,097.47	4.36	-43.30	-43.19	2.00	2.00	0.00	0.00
2,200.00	12.00	275.75	2,195.62	6.27	-62.29	-62.12	2.00	2.00	0.00	0.00
2,300.00	14.00	275.75	2,293.06	8.53	-84.67	-84.44	2.00	2.00	0.00	0.00
End Nudge @ 2300.00' MD										
2,400.00	14.00	275.75	2,390.08	10.95	-108.74	-108.45	0.00	0.00	0.00	0.00
2,500.00	14.00	275.75	2,487.11	13.37	-132.81	-132.45	0.00	0.00	0.00	0.00
2,600.00	14.00	275.75	2,584.14	15.80	-156.88	-156.46	0.00	0.00	0.00	0.00
2,700.00	14.00	275.75	2,681.17	18.22	-180.95	-180.46	0.00	0.00	0.00	0.00
2,800.00	14.00	275.75	2,778.20	20.64	-205.02	-204.47	0.00	0.00	0.00	0.00
2,900.00	14.00	275.75	2,875.23	23.07	-229.09	-228.47	0.00	0.00	0.00	0.00
3,000.00	14.00	275.75	2,972.26	25.49	-253.16	-252.48	0.00	0.00	0.00	0.00
3,100.00	14.00	275.75	3,069.29	27.92	-277.23	-276.49	0.00	0.00	0.00	0.00
3,200.00	14.00	275.75	3,166.32	30.34	-301.30	-300.49	0.00	0.00	0.00	0.00
3,300.00	14.00	275.75	3,263.35	32.76	-325.37	-324.50	0.00	0.00	0.00	0.00
3,400.00	14.00	275.75	3,360.38	35.19	-349.44	-348.50	0.00	0.00	0.00	0.00
3,500.00	14.00	275.75	3,457.41	37.61	-373.51	-372.51	0.00	0.00	0.00	0.00
3,600.00	14.00	275.75	3,554.44	40.03	-397.58	-396.51	0.00	0.00	0.00	0.00
3,700.00	14.00	275.75	3,651.47	42.46	-421.65	-420.52	0.00	0.00	0.00	0.00
3,739.71	14.00	275.75	3,690.00	43.42	-431.21	-430.05	0.00	0.00	0.00	0.00
Parkman										
3,800.00	14.00	275.75	3,748.50	44.88	-445.73	-444.52	0.00	0.00	0.00	0.00
3,900.00	14.00	275.75	3,845.53	47.31	-469.80	-468.53	0.00	0.00	0.00	0.00
4,000.00	14.00	275.75	3,942.56	49.73	-493.87	-492.54	0.00	0.00	0.00	0.00
4,100.00	14.00	275.75	4,039.59	52.15	-517.94	-516.54	0.00	0.00	0.00	0.00
4,200.00	14.00	275.75	4,136.62	54.58	-542.01	-540.55	0.00	0.00	0.00	0.00
4,300.00	14.00	275.75	4,233.65	57.00	-566.08	-564.55	0.00	0.00	0.00	0.00
4,360.14	14.00	275.75	4,292.00	58.46	-580.55	-578.99	0.00	0.00	0.00	0.00
Sussex										



Plan Report for WHISPER ROCK 9N-25HZ - Permit Rev-1

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 (°)
4,400.00	14.00	275.75	4,330.68	59.42	-590.15	-588.56	0.00	0.00	0.00	0.00
4,500.00	14.00	275.75	4,427.71	61.85	-614.22	-612.56	0.00	0.00	0.00	0.00
4,600.00	14.00	275.75	4,524.74	64.27	-638.29	-636.57	0.00	0.00	0.00	0.00
4,700.00	14.00	275.75	4,621.76	66.70	-662.36	-660.58	0.00	0.00	0.00	0.00
4,800.00	14.00	275.75	4,718.79	69.12	-686.43	-684.58	0.00	0.00	0.00	0.00
4,900.00	14.00	275.75	4,815.82	71.54	-710.50	-708.59	0.00	0.00	0.00	0.00
5,000.00	14.00	275.75	4,912.85	73.97	-734.57	-732.59	0.00	0.00	0.00	0.00
5,100.00	14.00	275.75	5,009.88	76.39	-758.64	-756.60	0.00	0.00	0.00	0.00
5,200.00	14.00	275.75	5,106.91	78.81	-782.71	-780.60	0.00	0.00	0.00	0.00
5,300.00	14.00	275.75	5,203.94	81.24	-806.78	-804.61	0.00	0.00	0.00	0.00
5,400.00	14.00	275.75	5,300.97	83.66	-830.85	-828.62	0.00	0.00	0.00	0.00
5,500.00	14.00	275.75	5,398.00	86.09	-854.92	-852.62	0.00	0.00	0.00	0.00
5,600.00	14.00	275.75	5,495.03	88.51	-878.99	-876.63	0.00	0.00	0.00	0.00
5,700.00	14.00	275.75	5,592.06	90.93	-903.06	-900.63	0.00	0.00	0.00	0.00
5,800.00	14.00	275.75	5,689.09	93.36	-927.13	-924.64	0.00	0.00	0.00	0.00
5,900.00	14.00	275.75	5,786.12	95.78	-951.21	-948.64	0.00	0.00	0.00	0.00
5,965.83	14.00	275.75	5,849.99	97.38	-967.05	-964.45	0.00	0.00	0.00	0.00
Begin Drop @ 5965.83' MD										
6,000.00	13.32	275.75	5,883.20	98.19	-975.08	-972.45	2.00	-2.00	0.00	180.00
6,100.00	11.32	275.75	5,980.89	100.32	-996.30	-993.62	2.00	-2.00	0.00	180.00
6,200.00	9.32	275.75	6,079.27	102.12	-1,014.12	-1,011.39	2.00	-2.00	0.00	180.00
6,300.00	7.32	275.75	6,178.21	103.57	-1,028.51	-1,025.74	2.00	-2.00	0.00	180.00
6,400.00	5.32	275.75	6,277.60	104.67	-1,039.46	-1,036.66	2.00	-2.00	0.00	180.00
6,500.00	3.32	275.75	6,377.31	105.42	-1,046.94	-1,044.12	2.00	-2.00	0.00	180.00
6,600.00	1.32	275.75	6,477.23	105.83	-1,050.97	-1,048.14	2.00	-2.00	0.00	180.00
6,665.83	0.00	0.00	6,543.05	105.90	-1,051.72	-1,048.89	2.00	-2.00	0.00	180.00
End Drop @ 6665.83' MD - Top of 4.5" Liner @ 6665.83' MD										
6,700.00	0.00	0.00	6,577.22	105.90	-1,051.72	-1,048.89	0.00	0.00	0.00	0.00
6,765.83	0.00	0.00	6,643.05	105.90	-1,051.72	-1,048.89	0.00	0.00	0.00	0.00
KOP @ 6765.83' MD										
6,800.00	3.42	89.83	6,677.20	105.91	-1,050.70	-1,047.87	10.00	10.00	0.00	89.83
6,900.00	13.42	89.83	6,776.00	105.95	-1,036.08	-1,033.25	10.00	10.00	0.00	0.00
7,000.00	23.42	89.83	6,870.75	106.04	-1,004.53	-1,001.70	10.00	10.00	0.00	0.00
DLS = 10.00										
7,100.00	33.42	89.83	6,958.59	106.18	-957.00	-954.19	10.00	10.00	0.00	0.00
7,200.00	43.42	89.83	7,036.84	106.36	-894.94	-892.14	10.00	10.00	0.00	0.00
7,258.18	49.23	89.83	7,077.00	106.48	-852.88	-850.09	10.00	10.00	0.00	0.00
Sharon Springs										
7,300.00	53.42	89.83	7,103.13	106.57	-820.23	-817.45	10.00	10.00	0.00	0.00
7,332.96	56.71	89.83	7,122.00	106.65	-793.22	-790.44	10.00	10.00	0.00	0.00
Niobrara A										
7,400.00	63.42	89.83	7,155.44	106.82	-735.15	-732.39	10.00	10.00	0.00	0.00
7,500.00	73.42	89.83	7,192.17	107.09	-642.28	-639.54	10.00	10.00	0.00	0.00
7,558.61	79.28	89.83	7,206.00	107.26	-585.36	-582.63	10.00	10.00	0.00	0.00
Niobrara B										
7,600.00	83.42	89.83	7,212.23	107.37	-544.44	-541.72	10.00	10.00	0.00	0.00
7,663.97	89.81	89.83	7,216.00	107.56	-480.61	-477.91	10.00	10.00	0.00	0.00
Landing Target (Heel) - Total Depth (Toe)										
7,665.83	90.00	89.83	7,216.00	107.56	-478.76	-476.05	9.98	9.98	0.00	0.00
End Build @ 7665.83' MD - 7"										
7,674.62	90.00	89.83	7,216.00	107.59	-469.97	-467.27	0.00	0.00	0.00	0.00
WHISPER ROCK 9N-25HZ_Heel										
7,700.00	90.00	89.83	7,216.00	107.66	-444.59	-441.89	0.00	0.00	0.00	0.00
7,800.00	90.00	89.83	7,216.00	107.95	-344.59	-341.91	0.00	0.00	0.00	0.00
7,900.00	90.00	89.83	7,216.00	108.24	-244.59	-241.93	0.00	0.00	0.00	0.00
8,000.00	90.00	89.83	7,216.00	108.53	-144.59	-141.95	0.00	0.00	0.00	0.00
8,100.00	90.00	89.83	7,216.00	108.82	-44.59	-41.98	0.00	0.00	0.00	0.00
8,200.00	90.00	89.83	7,216.00	109.11	55.41	58.00	0.00	0.00	0.00	0.00

Plan Report for WHISPER ROCK 9N-25HZ - Permit Rev-1

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 (°)
8,300.00	90.00	89.83	7,216.00	109.40	155.41	157.98	0.00	0.00	0.00	0.00
8,400.00	90.00	89.83	7,216.00	109.69	255.41	257.96	0.00	0.00	0.00	0.00
8,500.00	90.00	89.83	7,216.00	109.98	355.41	357.94	0.00	0.00	0.00	0.00
8,600.00	90.00	89.83	7,216.00	110.27	455.41	457.91	0.00	0.00	0.00	0.00
8,700.00	90.00	89.83	7,216.00	110.56	555.41	557.89	0.00	0.00	0.00	0.00
8,800.00	90.00	89.83	7,216.00	110.85	655.41	657.87	0.00	0.00	0.00	0.00
8,900.00	90.00	89.83	7,216.00	111.14	755.41	757.85	0.00	0.00	0.00	0.00
9,000.00	90.00	89.83	7,216.00	111.43	855.41	857.83	0.00	0.00	0.00	0.00
9,100.00	90.00	89.83	7,216.00	111.72	955.41	957.80	0.00	0.00	0.00	0.00
9,200.00	90.00	89.83	7,216.00	112.01	1,055.41	1,057.78	0.00	0.00	0.00	0.00
9,300.00	90.00	89.83	7,216.00	112.30	1,155.41	1,157.76	0.00	0.00	0.00	0.00
9,400.00	90.00	89.83	7,216.00	112.59	1,255.40	1,257.74	0.00	0.00	0.00	0.00
9,500.00	90.00	89.83	7,216.00	112.88	1,355.40	1,357.72	0.00	0.00	0.00	0.00
9,600.00	90.00	89.83	7,216.00	113.17	1,455.40	1,457.69	0.00	0.00	0.00	0.00
9,700.00	90.00	89.83	7,216.00	113.47	1,555.40	1,557.67	0.00	0.00	0.00	0.00
9,800.00	90.00	89.83	7,216.00	113.76	1,655.40	1,657.65	0.00	0.00	0.00	0.00
9,900.00	90.00	89.83	7,216.00	114.05	1,755.40	1,757.63	0.00	0.00	0.00	0.00
10,000.00	90.00	89.83	7,216.00	114.34	1,855.40	1,857.61	0.00	0.00	0.00	0.00
10,100.00	90.00	89.83	7,216.00	114.63	1,955.40	1,957.58	0.00	0.00	0.00	0.00
10,200.00	90.00	89.83	7,216.00	114.92	2,055.40	2,057.56	0.00	0.00	0.00	0.00
10,300.00	90.00	89.83	7,216.00	115.21	2,155.40	2,157.54	0.00	0.00	0.00	0.00
10,400.00	90.00	89.83	7,216.00	115.50	2,255.40	2,257.52	0.00	0.00	0.00	0.00
10,500.00	90.00	89.83	7,216.00	115.79	2,355.40	2,357.49	0.00	0.00	0.00	0.00
10,600.00	90.00	89.83	7,216.00	116.08	2,455.40	2,457.47	0.00	0.00	0.00	0.00
10,700.00	90.00	89.83	7,216.00	116.37	2,555.40	2,557.45	0.00	0.00	0.00	0.00
10,800.00	90.00	89.83	7,216.00	116.66	2,655.40	2,657.43	0.00	0.00	0.00	0.00
10,900.00	90.00	89.83	7,216.00	116.95	2,755.40	2,757.41	0.00	0.00	0.00	0.00
11,000.00	90.00	89.83	7,216.00	117.24	2,855.40	2,857.38	0.00	0.00	0.00	0.00
11,100.00	90.00	89.83	7,216.00	117.53	2,955.40	2,957.36	0.00	0.00	0.00	0.00
11,200.00	90.00	89.83	7,216.00	117.82	3,055.40	3,057.34	0.00	0.00	0.00	0.00
11,300.00	90.00	89.83	7,216.00	118.11	3,155.40	3,157.32	0.00	0.00	0.00	0.00
11,400.00	90.00	89.83	7,216.00	118.40	3,255.40	3,257.30	0.00	0.00	0.00	0.00
11,500.00	90.00	89.83	7,216.00	118.69	3,355.40	3,357.27	0.00	0.00	0.00	0.00
11,600.00	90.00	89.83	7,216.00	118.98	3,455.40	3,457.25	0.00	0.00	0.00	0.00
11,700.00	90.00	89.83	7,216.00	119.27	3,555.39	3,557.23	0.00	0.00	0.00	0.00
11,800.00	90.00	89.83	7,216.00	119.56	3,655.39	3,657.21	0.00	0.00	0.00	0.00
11,900.00	90.00	89.83	7,216.00	119.85	3,755.39	3,757.19	0.00	0.00	0.00	0.00
12,000.00	90.00	89.83	7,216.00	120.14	3,855.39	3,857.16	0.00	0.00	0.00	0.00
12,100.00	90.00	89.83	7,216.00	120.43	3,955.39	3,957.14	0.00	0.00	0.00	0.00
12,200.00	90.00	89.83	7,216.00	120.72	4,055.39	4,057.12	0.00	0.00	0.00	0.00
12,300.00	90.00	89.83	7,216.00	121.01	4,155.39	4,157.10	0.00	0.00	0.00	0.00
12,400.00	90.00	89.83	7,216.00	121.30	4,255.39	4,257.08	0.00	0.00	0.00	0.00
12,500.00	90.00	89.83	7,216.00	121.59	4,355.39	4,357.05	0.00	0.00	0.00	0.00
12,600.00	90.00	89.83	7,216.00	121.88	4,455.39	4,457.03	0.00	0.00	0.00	0.00
12,700.00	90.00	89.83	7,216.00	122.17	4,555.39	4,557.01	0.00	0.00	0.00	0.00
12,800.00	90.00	89.83	7,216.00	122.46	4,655.39	4,656.99	0.00	0.00	0.00	0.00
12,900.00	90.00	89.83	7,216.00	122.75	4,755.39	4,756.97	0.00	0.00	0.00	0.00
13,000.00	90.00	89.83	7,216.00	123.04	4,855.39	4,856.94	0.00	0.00	0.00	0.00
13,100.00	90.00	89.83	7,216.00	123.33	4,955.39	4,956.92	0.00	0.00	0.00	0.00
13,200.00	90.00	89.83	7,216.00	123.62	5,055.39	5,056.90	0.00	0.00	0.00	0.00
13,300.00	90.00	89.83	7,216.00	123.91	5,155.39	5,156.88	0.00	0.00	0.00	0.00
13,329.49	90.00	89.83	7,216.00	123.99	5,184.88	5,186.36	0.00	0.00	0.00	0.00

TD Well @ 13329.49' MD - WHISPER ROCK 9N-25HZ_BHL

Plan Report for WHISPER ROCK 9N-25HZ - Permit Rev-1**Plan Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,600.00	1,600.00	0.00	0.00	Begin Nudge @ 1600.00' MD
2,300.00	2,293.06	8.53	-84.67	End Nudge @ 2300.00' MD
5,965.83	5,849.99	97.38	-967.05	Begin Drop @ 5965.83' MD
6,665.83	6,543.05	105.90	-1,051.72	End Drop @ 6665.83' MD
6,665.83	6,543.05	105.90	-1,051.72	Top of 4.5" Liner @ 6665.83' MD
6,765.83	6,643.05	105.90	-1,051.72	KOP @ 6765.83' MD
7,000.00	6,870.75	106.04	-1,004.53	DLS = 10.00
7,665.83	7,216.00	107.56	-478.76	End Build @ 7665.83' MD
13,329.49	7,216.00	123.99	5,184.88	TD Well @ 13329.49' MD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
TD	No Target (Freehand)	88.63	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,665.83	Permit Rev-1	MWD+IFR1
7,665.83	13,329.49	Permit Rev-1	MWD+IFR1

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
754.00	754.00	9 5/8"	9-5/8	13-1/2
7,665.83	7,216.00	7"	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
503.00	503.00	Base Fox Hills			
788.00	788.00	Surface Csg Setting Depth			
3,739.71	3,690.00	Parkman			
4,360.14	4,292.00	Sussex			
7,258.18	7,077.00	Sharon Springs			
7,332.96	7,122.00	Niobrara A			
7,558.61	7,206.00	Niobrara B			
7,663.97	7,216.00	Landing Target (Heel)			
7,663.97	7,216.00	Total Depth (Toe)			

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
4N-R68W-Sec. 26_Section Lines	122.00	4,066.56	-409.93	Polygon
4N-R68W-Sec. 25_Section Lines	122.00	4,066.56	-409.93	Polygon
WHISPER ROCK 9N-25HZ_BHL	7,216.00	123.99	5,184.88	Point
WHISPER ROCK 9N-25HZ_Heel	7,216.00	117.00	-470.00	Point

**North Reference Sheet for Wilson Ranch 16-26HZ Pad - WHISPER ROCK 9N-25HZ
- Plan A**

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.

Vertical Depths are relative to RKB = 17' @ 5091.00usft (Drilling Rig). Northing and Easting are relative to WHISPER ROCK 9N-25HZ

Coordinate System is Universal Transverse Mercator (US Survey Feet), Zone 13N (108 W to 102 W) using datum North American Datum 1983, ellipsoid

Projection method is Transverse Mercator (Gauss-Kruger)

Central Meridian is -105.00°, Longitude Origin:0.000000°, Latitude Origin:0.000000°

False Easting: 1,640,416.67usft, False Northing: 0.00usft, Scale Reduction: 0.99960013

Grid Coordinates of Well: 14,628,305.70 usft N, 1,651,023.27 usft E

Geographical Coordinates of Well: 40° 16' 44.13" N, 104° 57' 43.10" W

Grid Convergence at Surface is: 0.02°

Based upon Minimum Curvature type calculations, at a Measured Depth of 13,329.49usft the Bottom Hole Displacement is 5,186.36usft in the Direction of 88.63° (True).

Magnetic Convergence at surface is: -8.47° (25 November 2014, , IGRF2010)

