

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 21-T2N-66W

Lansdown State 29N-21HZ

Plan A

Plan: Rev A0 Permit

Sperry Drilling Services

Proposal Report

18 September, 2013

Well Coordinates: 1,286,942.49 N, 3,198,736.98 E (40° 07' 07.91" N, 104° 47' 21.72" W)

Ground Level: 4,935.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

Centered on Well Lansdown State 29N-21HZ

RKB = 17' @ 4952.00usft (Drilling Rig)

N

True

API - US Survey Feet - Custom

HALLIBURTON

Project: Weld County, CO (NAD 83)
 Site: Sec. 21-T2N-66W
 Well: Lansdown State 29N-21HZ
 Wellbore: Plan A
 Design: Rev A0 Permit



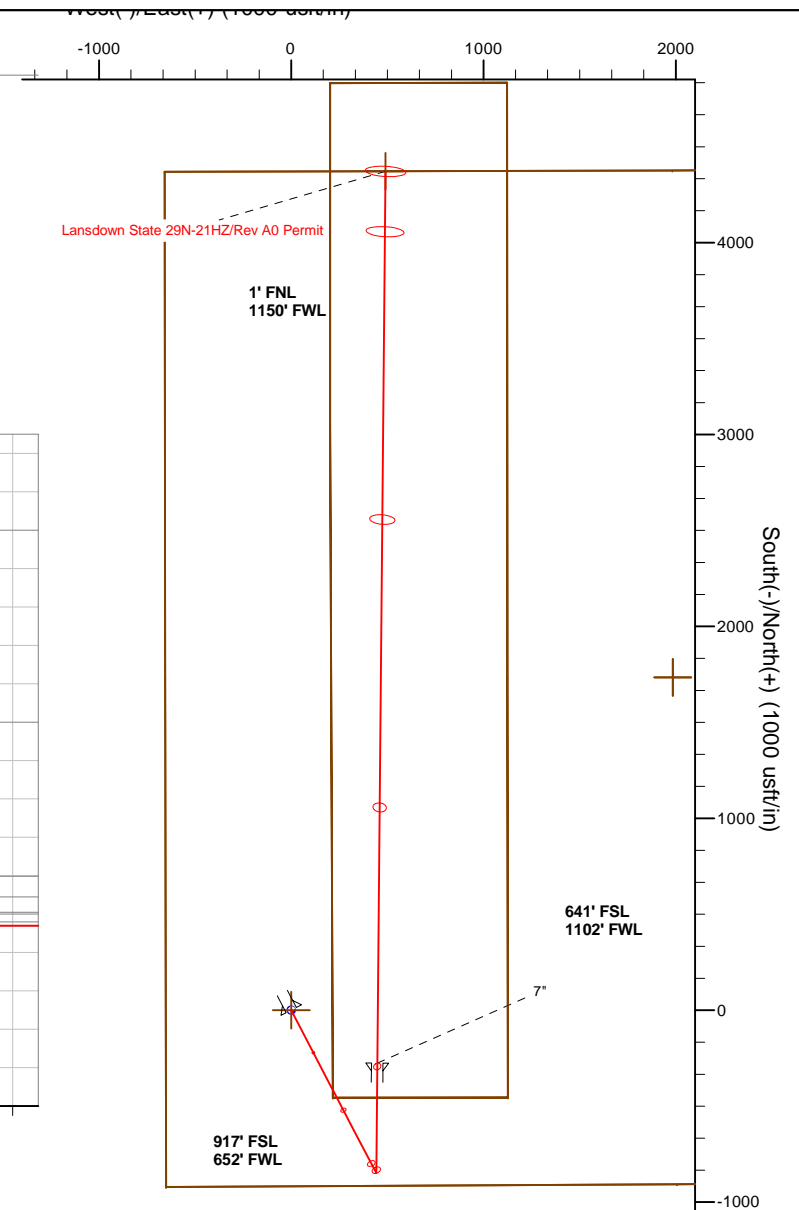
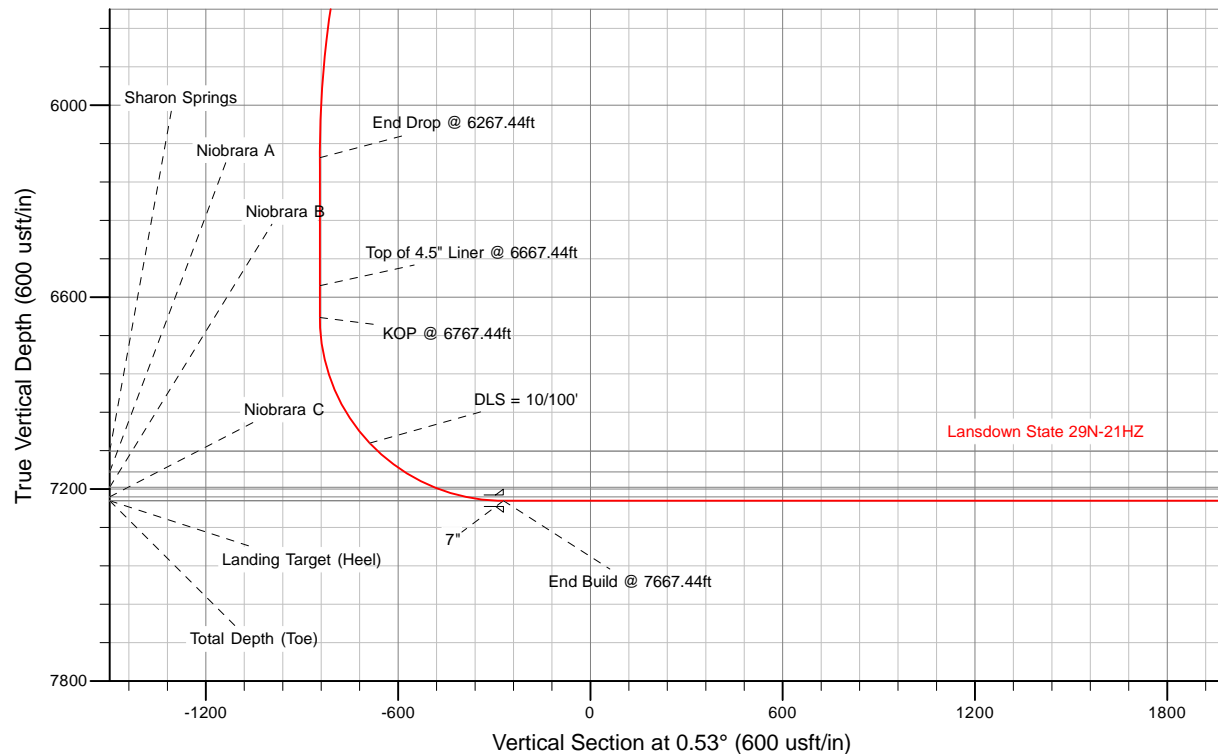
HALLIBURTON
 Sperry Drilling

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	1367.44	0.00	0.00	1367.44	0.00	0.00	0.00	0.00	0.00	
3	2017.44	13.00	152.46	2011.88	-65.10	33.95	2.00	152.46	-64.79	
4	5617.44	13.00	152.46	5519.61	-783.16	408.40	0.00	0.00	-779.35	
5	6267.44	0.00	0.00	6164.05	-848.26	442.35	2.00	180.00	-844.14	
6	6767.44	0.00	0.00	6664.05	-848.26	442.35	0.00	0.00	-844.14	
7	7667.44	90.00	0.53	7237.00	-275.33	447.66	10.00	0.53	-271.18	
8	2314.15	90.00	0.53	7237.00	4371.18	490.75	0.00	0.00	4375.52	Lansdown State 29-21HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Lansdown State 29-21HZ_LD	0.00	1734.21	1984.16	40° 7' 25.047 N104° 46' 56.183 W		Polygon
Lansdown State 29-21HZ_SHL	0.00	0.01	0.00	40° 7' 7.910 N104° 47' 21.725 W		Point
Lansdown_SEC	0.00	1734.21	1984.16	40° 7' 25.047 N104° 46' 56.183 W		Polygon
Lansdown State 29-21HZ_BHL	7237.00	4371.18	490.75	40° 7' 51.107 N104° 47' 15.407 W		Point



WELL DETAILS: Lansdown State 29N-21HZ		
Ground Level: 4935.00		
RKB = 17' @ 4952.00usft (Drilling Rig)		
Plan: Rev A0 Permit (Lansdown State 29N-21HZ/Plan A)		
Created By: Clint Eshelman Date: 09/18/2013		

TVD	MD	
6564.05	6667.44	Top of 4.5" Liner @ 6667.44ft
6664.05	6767.44	KOP @ 6767.44ft

Plan Report for Lansdown State 29N-21HZ - Rev A0 Permit

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
Lansdown_SEC - Lansdown State 29-21HZ_LD - Lansdown State 29-21HZ_SHL										
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
873.00	0.00	0.00	873.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills Base										
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
923.00	0.00	0.00	923.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"										
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
1,367.44	0.00	0.00	1,367.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 1367.44ft										
1,400.00	0.65	152.46	1,400.00	-0.16	0.09	-0.16	2.00	2.00	0.00	152.46
1,500.00	2.65	152.46	1,499.95	-2.72	1.42	-2.71	2.00	2.00	0.00	0.00
1,600.00	4.65	152.46	1,599.74	-8.37	4.36	-8.32	2.00	2.00	0.00	0.00
1,700.00	6.65	152.46	1,699.25	-17.10	8.92	-17.01	2.00	2.00	0.00	0.00
1,800.00	8.65	152.46	1,798.36	-28.90	15.07	-28.76	2.00	2.00	0.00	0.00
1,900.00	10.65	152.46	1,896.94	-43.77	22.82	-43.55	2.00	2.00	0.00	0.00
2,000.00	12.65	152.46	1,994.87	-61.67	32.16	-61.37	2.00	2.00	0.00	0.00
2,017.44	13.00	152.46	2,011.88	-65.10	33.95	-64.79	2.00	2.00	0.00	0.00
End Nudge @ 2017.44ft										
2,100.00	13.00	152.46	2,092.32	-81.57	42.54	-81.18	0.00	0.00	0.00	0.00
2,200.00	13.00	152.46	2,189.76	-101.52	52.94	-101.02	0.00	0.00	0.00	0.00
2,300.00	13.00	152.46	2,287.20	-121.46	63.34	-120.87	0.00	0.00	0.00	0.00
2,400.00	13.00	152.46	2,384.63	-141.41	73.74	-140.72	0.00	0.00	0.00	0.00
2,500.00	13.00	152.46	2,482.07	-161.36	84.14	-160.57	0.00	0.00	0.00	0.00
2,600.00	13.00	152.46	2,579.51	-181.30	94.54	-180.42	0.00	0.00	0.00	0.00
2,700.00	13.00	152.46	2,676.94	-201.25	104.95	-200.27	0.00	0.00	0.00	0.00
2,800.00	13.00	152.46	2,774.38	-221.19	115.35	-220.12	0.00	0.00	0.00	0.00
2,900.00	13.00	152.46	2,871.82	-241.14	125.75	-239.97	0.00	0.00	0.00	0.00
3,000.00	13.00	152.46	2,969.25	-261.09	136.15	-259.82	0.00	0.00	0.00	0.00
3,100.00	13.00	152.46	3,066.69	-281.03	146.55	-279.67	0.00	0.00	0.00	0.00
3,200.00	13.00	152.46	3,164.13	-300.98	156.95	-299.51	0.00	0.00	0.00	0.00
3,300.00	13.00	152.46	3,261.57	-320.92	167.35	-319.36	0.00	0.00	0.00	0.00
3,400.00	13.00	152.46	3,359.00	-340.87	177.75	-339.21	0.00	0.00	0.00	0.00
3,500.00	13.00	152.46	3,456.44	-360.82	188.16	-359.06	0.00	0.00	0.00	0.00
3,600.00	13.00	152.46	3,553.88	-380.76	198.56	-378.91	0.00	0.00	0.00	0.00
3,700.00	13.00	152.46	3,651.31	-400.71	208.96	-398.76	0.00	0.00	0.00	0.00
3,800.00	13.00	152.46	3,748.75	-420.65	219.36	-418.61	0.00	0.00	0.00	0.00
3,900.00	13.00	152.46	3,846.19	-440.60	229.76	-438.46	0.00	0.00	0.00	0.00
4,000.00	13.00	152.46	3,943.62	-460.55	240.16	-458.31	0.00	0.00	0.00	0.00
4,100.00	13.00	152.46	4,041.06	-480.49	250.56	-478.16	0.00	0.00	0.00	0.00
4,131.75	13.00	152.46	4,072.00	-486.82	253.87	-484.46	0.00	0.00	0.00	0.00
Parkman										
4,200.00	13.00	152.46	4,138.50	-500.44	260.96	-498.01	0.00	0.00	0.00	0.00
4,300.00	13.00	152.46	4,235.94	-520.38	271.37	-517.85	0.00	0.00	0.00	0.00
4,400.00	13.00	152.46	4,333.37	-540.33	281.77	-537.70	0.00	0.00	0.00	0.00
4,500.00	13.00	152.46	4,430.81	-560.28	292.17	-557.55	0.00	0.00	0.00	0.00
4,600.00	13.00	152.46	4,528.25	-580.22	302.57	-577.40	0.00	0.00	0.00	0.00

Plan Report for Lansdown State 29N-21HZ - Rev A0 Permit

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 (°)
4,650.04	13.00	152.46	4,577.00	-590.20	307.77	-587.33	0.00	0.00	0.00	0.00
Sussex										
4,700.00	13.00	152.46	4,625.68	-600.17	312.97	-597.25	0.00	0.00	0.00	0.00
4,800.00	13.00	152.46	4,723.12	-620.11	323.37	-617.10	0.00	0.00	0.00	0.00
4,900.00	13.00	152.46	4,820.56	-640.06	333.77	-636.95	0.00	0.00	0.00	0.00
5,000.00	13.00	152.46	4,917.99	-660.01	344.18	-656.80	0.00	0.00	0.00	0.00
5,100.00	13.00	152.46	5,015.43	-679.95	354.58	-676.65	0.00	0.00	0.00	0.00
5,200.00	13.00	152.46	5,112.87	-699.90	364.98	-696.50	0.00	0.00	0.00	0.00
5,300.00	13.00	152.46	5,210.31	-719.84	375.38	-716.35	0.00	0.00	0.00	0.00
5,400.00	13.00	152.46	5,307.74	-739.79	385.78	-736.19	0.00	0.00	0.00	0.00
5,500.00	13.00	152.46	5,405.18	-759.74	396.18	-756.04	0.00	0.00	0.00	0.00
5,600.00	13.00	152.46	5,502.62	-779.68	406.58	-775.89	0.00	0.00	0.00	0.00
5,617.44	13.00	152.46	5,519.61	-783.16	408.40	-779.35	0.00	0.00	0.00	0.00
Begin Drop @ 5617.44ft										
5,700.00	11.35	152.46	5,600.31	-798.60	416.45	-794.72	2.00	-2.00	0.00	180.00
5,800.00	9.35	152.46	5,698.68	-814.52	424.75	-810.57	2.00	-2.00	0.00	180.00
5,900.00	7.35	152.46	5,797.61	-827.40	431.47	-823.38	2.00	-2.00	0.00	180.00
6,000.00	5.35	152.46	5,897.00	-837.20	436.58	-833.14	2.00	-2.00	0.00	180.00
6,100.00	3.35	152.46	5,996.70	-843.93	440.09	-839.83	2.00	-2.00	0.00	180.00
6,200.00	1.35	152.46	6,096.61	-847.56	441.98	-843.44	2.00	-2.00	0.00	180.00
6,267.44	0.00	0.00	6,164.05	-848.26	442.35	-844.14	2.00	-2.00	0.00	-180.00
End Drop @ 6267.44ft										
6,300.00	0.00	0.00	6,196.61	-848.26	442.35	-844.14	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,296.61	-848.26	442.35	-844.14	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,396.61	-848.26	442.35	-844.14	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,496.61	-848.26	442.35	-844.14	0.00	0.00	0.00	0.00
6,667.44	0.00	0.00	6,564.05	-848.26	442.35	-844.14	0.00	0.00	0.00	0.00
Top of 4.5" Liner @ 6667.44ft										
6,700.00	0.00	0.00	6,596.61	-848.26	442.35	-844.14	0.00	0.00	0.00	0.00
6,767.44	0.00	0.00	6,664.05	-848.26	442.35	-844.14	0.00	0.00	0.00	0.00
KOP @ 6767.44ft										
6,800.00	3.26	0.53	6,696.59	-847.34	442.36	-843.22	10.00	10.00	0.00	0.53
6,900.00	13.26	0.53	6,795.43	-833.00	442.49	-828.88	10.00	10.00	0.00	0.00
7,000.00	23.26	0.53	6,890.27	-801.71	442.78	-797.59	10.00	10.00	0.00	0.00
7,100.00	33.26	0.53	6,978.25	-754.43	443.22	-750.31	10.00	10.00	0.00	0.00
7,200.00	43.26	0.53	7,056.67	-692.60	443.79	-688.47	10.00	10.00	0.00	0.00
DLS = 10/100'										
7,235.86	46.84	0.53	7,082.00	-667.23	444.03	-663.10	10.00	10.00	0.00	0.00
Sharon Springs										
7,300.00	53.26	0.53	7,123.17	-618.08	444.48	-613.95	10.00	10.00	0.00	0.00
7,341.93	57.45	0.53	7,147.00	-583.60	444.80	-579.47	10.00	10.00	0.00	0.00
Niobrara A										
7,400.00	63.26	0.53	7,175.71	-533.15	445.27	-529.02	10.00	10.00	0.00	0.00
7,446.68	67.92	0.53	7,195.00	-490.66	445.66	-486.52	10.00	10.00	0.00	0.00
Niobrara B										
7,500.00	73.26	0.53	7,212.71	-440.39	446.13	-436.25	10.00	10.00	0.00	0.00
7,549.95	78.25	0.53	7,225.00	-392.00	446.58	-387.86	10.00	10.00	0.00	0.00
Niobrara C										
7,600.00	83.26	0.53	7,233.04	-342.61	447.04	-338.47	10.00	10.00	0.00	0.00
7,667.44	90.00	0.53	7,237.00	-275.33	447.66	-271.18	10.00	10.00	0.00	0.00
End Build @ 7667.44ft - Landing Target (Heel) - 7"										
7,700.00	90.00	0.53	7,237.00	-242.77	447.96	-238.62	0.00	0.00	0.00	0.00
7,800.00	90.00	0.53	7,237.00	-142.78	448.89	-138.62	0.00	0.00	0.00	0.00
7,900.00	90.00	0.53	7,237.00	-42.78	449.82	-38.62	0.00	0.00	0.00	0.00
8,000.00	90.00	0.53	7,237.00	57.22	450.74	61.38	0.00	0.00	0.00	0.00
8,100.00	90.00	0.53	7,237.00	157.21	451.67	161.38	0.00	0.00	0.00	0.00
8,200.00	90.00	0.53	7,237.00	257.21	452.60	261.38	0.00	0.00	0.00	0.00
8,300.00	90.00	0.53	7,237.00	357.20	453.53	361.38	0.00	0.00	0.00	0.00

Plan Report for Lansdown State 29N-21HZ - Rev A0 Permit

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 (°)
8,400.00	90.00	0.53	7,237.00	457.20	454.45	461.38	0.00	0.00	0.00	0.00
8,500.00	90.00	0.53	7,237.00	557.19	455.38	561.38	0.00	0.00	0.00	0.00
8,600.00	90.00	0.53	7,237.00	657.19	456.31	661.38	0.00	0.00	0.00	0.00
8,700.00	90.00	0.53	7,237.00	757.18	457.23	761.38	0.00	0.00	0.00	0.00
8,800.00	90.00	0.53	7,237.00	857.18	458.16	861.38	0.00	0.00	0.00	0.00
8,900.00	90.00	0.53	7,237.00	957.18	459.09	961.38	0.00	0.00	0.00	0.00
9,000.00	90.00	0.53	7,237.00	1,057.17	460.02	1,061.38	0.00	0.00	0.00	0.00
9,100.00	90.00	0.53	7,237.00	1,157.17	460.94	1,161.38	0.00	0.00	0.00	0.00
9,200.00	90.00	0.53	7,237.00	1,257.16	461.87	1,261.38	0.00	0.00	0.00	0.00
9,300.00	90.00	0.53	7,237.00	1,357.16	462.80	1,361.38	0.00	0.00	0.00	0.00
9,400.00	90.00	0.53	7,237.00	1,457.15	463.72	1,461.38	0.00	0.00	0.00	0.00
9,500.00	90.00	0.53	7,237.00	1,557.15	464.65	1,561.38	0.00	0.00	0.00	0.00
9,600.00	90.00	0.53	7,237.00	1,657.15	465.58	1,661.38	0.00	0.00	0.00	0.00
9,700.00	90.00	0.53	7,237.00	1,757.14	466.51	1,761.38	0.00	0.00	0.00	0.00
9,800.00	90.00	0.53	7,237.00	1,857.14	467.43	1,861.38	0.00	0.00	0.00	0.00
9,900.00	90.00	0.53	7,237.00	1,957.13	468.36	1,961.38	0.00	0.00	0.00	0.00
10,000.00	90.00	0.53	7,237.00	2,057.13	469.29	2,061.38	0.00	0.00	0.00	0.00
10,100.00	90.00	0.53	7,237.00	2,157.12	470.22	2,161.38	0.00	0.00	0.00	0.00
10,200.00	90.00	0.53	7,237.00	2,257.12	471.14	2,261.38	0.00	0.00	0.00	0.00
10,300.00	90.00	0.53	7,237.00	2,357.12	472.07	2,361.38	0.00	0.00	0.00	0.00
10,400.00	90.00	0.53	7,237.00	2,457.11	473.00	2,461.38	0.00	0.00	0.00	0.00
10,500.00	90.00	0.53	7,237.00	2,557.11	473.92	2,561.38	0.00	0.00	0.00	0.00
10,600.00	90.00	0.53	7,237.00	2,657.10	474.85	2,661.38	0.00	0.00	0.00	0.00
10,700.00	90.00	0.53	7,237.00	2,757.10	475.78	2,761.38	0.00	0.00	0.00	0.00
10,800.00	90.00	0.53	7,237.00	2,857.09	476.71	2,861.38	0.00	0.00	0.00	0.00
10,900.00	90.00	0.53	7,237.00	2,957.09	477.63	2,961.38	0.00	0.00	0.00	0.00
11,000.00	90.00	0.53	7,237.00	3,057.09	478.56	3,061.38	0.00	0.00	0.00	0.00
11,100.00	90.00	0.53	7,237.00	3,157.08	479.49	3,161.38	0.00	0.00	0.00	0.00
11,200.00	90.00	0.53	7,237.00	3,257.08	480.42	3,261.38	0.00	0.00	0.00	0.00
11,300.00	90.00	0.53	7,237.00	3,357.07	481.34	3,361.38	0.00	0.00	0.00	0.00
11,400.00	90.00	0.53	7,237.00	3,457.07	482.27	3,461.38	0.00	0.00	0.00	0.00
11,500.00	90.00	0.53	7,237.00	3,557.06	483.20	3,561.38	0.00	0.00	0.00	0.00
11,600.00	90.00	0.53	7,237.00	3,657.06	484.12	3,661.38	0.00	0.00	0.00	0.00
11,700.00	90.00	0.53	7,237.00	3,757.06	485.05	3,761.38	0.00	0.00	0.00	0.00
11,800.00	90.00	0.53	7,237.00	3,857.05	485.98	3,861.38	0.00	0.00	0.00	0.00
11,900.00	90.00	0.53	7,237.00	3,957.05	486.91	3,961.38	0.00	0.00	0.00	0.00
12,000.00	90.00	0.53	7,237.00	4,057.04	487.83	4,061.38	0.00	0.00	0.00	0.00
12,100.00	90.00	0.53	7,237.00	4,157.04	488.76	4,161.38	0.00	0.00	0.00	0.00
12,200.00	90.00	0.53	7,237.00	4,257.03	489.69	4,261.38	0.00	0.00	0.00	0.00
12,300.00	90.00	0.53	7,237.00	4,357.03	490.61	4,361.38	0.00	0.00	0.00	0.00
12,314.14	90.00	0.53	7,237.00	4,371.17	490.75	4,375.52	0.00	0.00	0.00	0.00
Total Depth (Toe)										
12,314.15	90.00	0.53	7,237.00	4,371.18	490.75	4,375.52	0.00	0.00	0.00	0.00
TD Well @ 12314.15ft - Lansdown State 29-21HZ_BHL										

Plan Report for Lansdown State 29N-21HZ - Rev A0 Permit

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,367.44	1,367.44	0.00	0.00	Begin Nudge @ 1367.44ft
2,017.44	2,011.88	-65.10	33.95	End Nudge @ 2017.44ft
5,617.44	5,519.61	-783.16	408.40	Begin Drop @ 5617.44ft
6,267.44	6,164.05	-848.26	442.35	End Drop @ 6267.44ft
6,667.44	6,564.05	-848.26	442.35	Top of 4.5" Liner @ 6667.44ft
6,767.44	6,664.05	-848.26	442.35	KOP @ 6767.44ft
7,200.00	7,056.67	-692.60	443.79	DLS = 10/100'
7,667.44	7,237.00	-275.33	447.66	End Build @ 7667.44ft
12,314.15	7,237.00	4,371.18	490.75	TD Well @ 12314.15ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	0.53	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,667.44	Rev A0 Permit	MWD
7,667.44	12,314.15	Rev A0 Permit	MWD

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
923.00	923.00	9 5/8"	9-5/8	13-1/2
7,667.44	7,237.00	7"	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
873.00	873.00	Fox Hills Base		0.00	
4,131.75	4,072.00	Parkman		0.00	
4,650.04	4,577.00	Sussex		0.00	
7,235.86	7,082.00	Sharon Springs		0.00	
7,341.93	7,147.00	Niobrara A		0.00	
7,446.68	7,195.00	Niobrara B		0.00	
7,549.95	7,225.00	Niobrara C		0.00	
7,667.44	7,237.00	Landing Target (Heel)		0.00	
12,314.14	7,237.00	Total Depth (Toe)		0.00	

Plan Report for Lansdown State 29N-21HZ - Rev A0 Permit

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
Lansdown_SEC	0.00	1,734.21	1,984.16	Polygon
Lansdown State 29-21HZ_LD	0.00	1,734.21	1,984.16	Polygon
Lansdown State 29-21HZ_SHL	0.00	0.00	0.00	Point
Lansdown State 29-21HZ_BHL	7,237.00	4,371.18	490.75	Point

Directional Difficulty Index

Average Dogleg over Survey:	0.94 °/100usft	Maximum Dogleg over Survey:	10.00 °/100usft at 7,667.44 usft
Net Tortousity applicable to Plans:	0.94 °/100usft	Directional Difficulty Index:	6.243

Audit Info

North Reference Sheet for Sec. 21-T2N-66W - Lansdown State 29N-21HZ - 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' @ 4952.00usft (Drilling Rig). Northing and Easting are relative to Lansdown State 29N-21HZ
 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° 0' 0.000 E°, Latitude Origin:40° 47' 0.000 N°
 False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99995948

Grid Coordinates of Well: 1,286,942.49 usft N, 3,198,736.98 usft E
 Geographical Coordinates of Well: 40° 07' 07.91" N, 104° 47' 21.72" W
 Grid Convergence at Surface is: 0.46°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,314.15usft
 the Bottom Hole Displacement is 4,398.64usft in the Direction of 6.41° (True).
 Magnetic Convergence at surface is: -8.12° (18 September 2013, BGGM2013)

