

TD: 17129 MD
 ~484 FNL ~1662 FEL
 40.089432 N 104.627750 W



Plan Data for SPARBOE 27C-26HZ

Field: Wattenberg_ANADARKO_Sparboe 15-35HZ_NAD 83
Map Unit: USft Vertical Reference Datum (VRD): Mean Sea Level
Projected Coordinate System: NAD83 / Colorado North (ftUS)

Slot: SPARBOE 27C-26HZ
Position:
 Offset is from Site centre
 +N/-S: 0.00USft Northing: 1276264.62USft Latitude: 40.088446°
 +E/-W: -29.66USft Easting: 3243920.30USft Longitude: -104.628189°
 Elevation Above VRD: 4953.00USft

Plan Point Information:
 DogLeg Severity Unit: °/100.00ft Position offsets from Slot centre

MD (USft)	Inc (°)	Az (°)	TVD (USft)	+N/-S (USft)	+E/-W (USft)	VSec (USft)	DLS (DLSU)	Toolface (°)
1746.00	0.09	50.15	1745.93	-2.16	1.95	-2.16	1.09	168.1R
2000.00	0.09	50.15	1999.93	-1.90	2.26	-1.90	0.00	0.0R
2232.78	4.63	155.70	2232.46	-10.35	6.27	-10.35	2.00	106.6R
5931.15	4.63	155.70	5918.76	-282.48	129.15	-282.43	0.00	0.0R
6162.69	0.00	0.00	6150.05	-291.00	133.00	-290.95	2.00	180.0R
6662.69	0.00	0.00	6650.04	-291.00	133.00	-290.95	0.00	0.0R
7561.69	89.90	359.57	7223.00	280.94	128.71	280.99	10.00	0.4L
11561.69	89.90	359.57	7229.98	4280.82	98.69	4280.86	0.00	0.0R
11717.05	89.90	0.35	7230.26	4436.18	98.58	4436.22	0.50	90.2R
17149.99	89.90	0.35	7240.00	9869.01	131.46	9869.06	0.00	0.0R

Survey Data for SPARBOE 27C-26HZ

Formation Point Information:

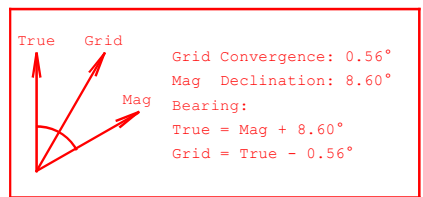
Name	TVD (USft)	Elevation (USft)	MD (USft)
FOX HILLS	816.00	4153.00	816.04
SUSSEX	4969.00	-0.00	4982.67
SHARON SPRINGS	6880.00	-1911.00	6904.55
NIOBRARA A	6905.00	-1936.00	6932.28
NIOBRARA B	6979.00	-2010.00	7017.61
NIOBRARA C	7061.00	-2092.00	7124.35
FORT HAYS	7201.00	-2232.00	7432.53
CODELL	7223.00	-2254.00	11186.04

Plan Data for SPARBOE 27C-26HZ

Target Set Information:

Name	TVD (USft)	Lat (°)	Long (°)	Shape
27C TARGET				
PBHL	7240.00	40.115538	-104.627719	Cuboid

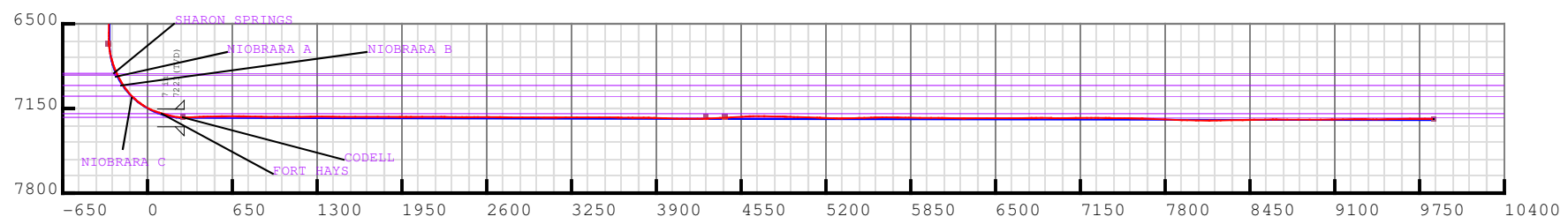
7 IN. CASING: 7638 MD
 ~701 FSL, ~1753 FEL
 40.088441 N 104.628183 W



Survey Data for SPARBOE 27C-26HZ

Casing Point Information:

Name	MD (USft)	TVD (USft)
9 5/8 in	1829.00	1828.93
7 in	7638.00	7216.82



5D Survey Report**Anadarko Petroleum**

Field Name: *Wattenberg_ANADARKO_Sparboe 15-35HZ_NAD 83*
Site Name: *SPARBOE 15-35HZ*
Well Name: *SPARBOE 27C-26HZ*
Survey: *Definitive Survey*





Surveys for the SPARBOE 27C-26HZ

Site Name SPARBOE 15-35HZ	Units : US ft	North Reference : True	Convergence Angle : 0.56	
	Position	Northing : 1276264.91 US ft	Latitude : 40.088446	
		Easting : 3243949.96 US ft	Longitude : -104.628083	
	Elevation above: 4953.00 US ft			
	Comment :			
Slot Name SPARBOE 27C-26HZ	Position (Offsets relative to Site Centre)			
	+N / -S : 0.00 US ft	Northing : 1276264.62 US ft	Latitude : 40.088446	
	+E / -W : -29.66 US ft	Easting : 3243920.30 US ft	Longitude : -104.628189	
	Elevation above : 4953.00 US ft			
	Comment :			
Well Name SPARBOE 27C-26HZ	Type : Main well	UWI :		
	Rig Height Well TVD Reference : 16.00 US ft	Comment :		
	Relative to : 4969.00 US ft	Closure Azimuth : 0.81789°		
	Closure Distance : 9845.67 US ft			
	Vertical Section (Position of Origin Relative to Slot)			
	+N / -S : 0.00 US ft	+E / -W : 0.00 US ft	Az : 0.02°	

5D Survey Report

Target Set

Name : 27C TARGET

Number of Targets : 1

Comment :

TargetName:	Position (Relative to centre)		
PBHL	+N / -S : 9869.01US ft	Northing : 1286134.45 US ft	Latitude : 40°6'55.936759"
Shape:	+E / -W : 131.46 US ft	Easting : 3243954.72US ft	Longitude : -104°37'39.788400"
Cuboid	TVD (Well TVD Reference) : 7240.00 US ft		
Orientation	Azimuth : 0.00°	Inclination : 0.00°	
Dimensions	Length : 1.00 US ft	Breadth : 1.00 US ft	Height : 1.00 US ft

Survey Name :Definitive Survey

Date : 05/Feb/2013

Survey Tool :

Comment :

Company :

Magnetic Model

Model Name: BGGM

Date: 04/Feb/2013

Field Strength: 52758.0 nT

Declination: 8.60°

Dip: 66.74°

Survey Tool Ranges

Name	Start MD (US ft)	End MD (US ft)	Source Survey
NSG Static GMS	0.00	1746.00	Surface Gyros
MWD + IFR	1746.00	17129.00	Actual Surveys

Casing Points (Relative to centre, TVD relative to Well TVD Reference)

Name	MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	Latitude (°)	Longitude (°)
9 5/8 in	1829.00	0.62	303.27	1828.93	-1.87	1.62	40.088441	-104.628183
7 in	7638.00	92.88	0.10	7216.82	359.30	122.79	40.089432	-104.627750

Well path created using minimum curvature

Survey Points (Relative to centre, TVD relative to Well TVD Reference)

MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	Latitude (°)	Longitude (°)	DLS (°/100 US ft)	T.Face (°)	VS (US ft)	Comment
0.00	0.00	0.00	0.00	0.00	0.00	1276264.62	3243920.30	40.088446	-104.628189	0.00	0.00	0.00	
16.00	0.00	0.00	16.00	0.00	0.00	1276264.62	3243920.30	40.088446	-104.628189	0.00	0.00	0.00	
116.00	0.33	49.68	116.00	0.19	0.22	1276264.81	3243920.52	40.088447	-104.628188	0.33	49.68	0.19	
216.00	0.25	61.56	216.00	0.48	0.63	1276265.10	3243920.93	40.088447	-104.628187	0.10	148.91	0.48	
316.00	0.41	102.04	316.00	0.51	1.17	1276265.14	3243921.47	40.088447	-104.628185	0.27	76.92	0.51	
416.00	0.63	119.10	415.99	0.16	2.00	1276264.80	3243922.30	40.088446	-104.628182	0.27	43.87	0.16	
516.00	0.99	110.87	515.98	-0.41	3.29	1276264.24	3243923.59	40.088445	-104.628177	0.38	337.95	-0.41	

5D Survey Report

Survey Points (Relative to centre, TVD relative to Well TVD Reference)													Comment
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	Latitude (°)	Longitude (°)	DLS (°/100 US ft)	T.Face (°)	VS (US ft)	
616.00	0.72	110.79	615.97	-0.94	4.69	1276263.72	3243924.99	40.088443	-104.628172	0.27	180.21	-0.94	
716.00	0.40	162.39	715.97	-1.50	5.38	1276263.18	3243925.69	40.088442	-104.628170	0.57	146.38	-1.50	
816.00	0.53	179.82	815.96	-2.29	5.49	1276262.38	3243925.81	40.088440	-104.628169	0.19	56.35	-2.29	
916.00	0.57	182.93	915.96	-3.25	5.46	1276261.42	3243925.79	40.088437	-104.628169	0.05	38.30	-3.25	
1016.00	0.46	220.48	1015.96	-4.05	5.18	1276260.62	3243925.51	40.088435	-104.628170	0.35	126.22	-4.05	
1116.00	0.59	243.32	1115.95	-4.59	4.45	1276260.07	3243924.80	40.088433	-104.628173	0.24	69.91	-4.59	
1216.00	0.47	246.68	1215.95	-4.98	3.62	1276259.67	3243923.97	40.088432	-104.628176	0.12	167.16	-4.98	
1316.00	0.29	304.16	1315.94	-5.00	3.03	1276259.65	3243923.38	40.088432	-104.628178	0.40	142.10	-5.00	
1416.00	0.63	303.15	1415.94	-4.56	2.36	1276260.08	3243922.71	40.088433	-104.628181	0.34	358.13	-4.56	
1516.00	0.33	357.82	1515.94	-3.97	1.89	1276260.67	3243922.23	40.088435	-104.628182	0.52	148.49	-3.97	
1616.00	0.62	1.98	1615.93	-3.15	1.90	1276261.49	3243922.23	40.088437	-104.628182	0.29	8.86	-3.14	
1716.00	0.38	1.86	1715.93	-2.27	1.93	1276262.37	3243922.25	40.088440	-104.628182	0.24	180.19	-2.27	
1746.00	0.09	50.15	1745.93	-2.16	1.95	1276262.48	3243922.27	40.088440	-104.628182	1.09	168.15	-2.16	TIE ON
1902.00	1.19	299.62	1901.92	-1.28	0.64	1276263.35	3243920.95	40.088442	-104.628187	0.78	245.52	-1.28	FIRST MWD+IFR SURVEY
1995.00	0.88	184.05	1994.91	-1.51	-0.25	1276263.10	3243920.06	40.088442	-104.628190	1.89	206.83	-1.51	
2087.00	3.09	166.65	2086.85	-4.63	0.27	1276259.99	3243920.61	40.088433	-104.628188	2.46	335.94	-4.63	
2178.00	4.41	152.68	2177.66	-10.13	2.44	1276254.52	3243922.84	40.088418	-104.628180	1.75	318.21	-10.13	
2271.00	4.21	152.29	2270.39	-16.33	5.67	1276248.35	3243926.13	40.088401	-104.628169	0.22	188.14	-16.32	
2363.00	3.57	150.50	2362.18	-21.81	8.65	1276242.90	3243929.16	40.088386	-104.628158	0.71	189.85	-21.81	
2457.00	4.42	146.67	2455.95	-27.38	12.08	1276237.36	3243932.65	40.088371	-104.628146	0.95	340.66	-27.38	
2549.00	4.01	144.35	2547.70	-32.96	15.90	1276231.82	3243936.53	40.088356	-104.628132	0.48	201.43	-32.95	
2642.00	5.01	153.44	2640.41	-39.23	19.61	1276225.58	3243940.30	40.088338	-104.628119	1.32	40.14	-39.23	
2735.00	4.34	150.81	2733.10	-45.94	23.15	1276218.91	3243943.90	40.088320	-104.628106	0.76	196.43	-45.93	
2827.00	3.94	152.34	2824.86	-51.78	26.31	1276213.11	3243947.12	40.088304	-104.628095	0.45	165.33	-51.77	
2912.00	4.48	152.90	2909.63	-57.32	29.18	1276207.59	3243950.04	40.088289	-104.628085	0.64	4.63	-57.31	
2997.00	4.57	153.73	2994.37	-63.31	32.19	1276201.63	3243953.11	40.088272	-104.628074	0.13	36.45	-63.30	
3083.00	4.12	151.53	3080.12	-69.10	35.18	1276195.87	3243956.16	40.088256	-104.628063	0.56	199.23	-69.09	
3168.00	3.72	153.64	3164.92	-74.25	37.86	1276190.74	3243958.89	40.088242	-104.628054	0.50	161.22	-74.24	
3254.00	3.99	158.04	3250.73	-79.53	40.22	1276185.49	3243961.30	40.088228	-104.628045	0.47	49.82	-79.51	
3339.00	4.29	158.55	3335.51	-85.23	42.49	1276179.81	3243963.62	40.088212	-104.628037	0.36	7.25	-85.21	
3425.00	5.42	160.76	3421.20	-92.06	45.00	1276173.01	3243966.20	40.088193	-104.628028	1.33	10.50	-92.04	
3510.00	6.34	168.86	3505.75	-100.45	47.23	1276164.64	3243968.52	40.088170	-104.628020	1.46	46.13	-100.44	
3595.00	6.27	174.44	3590.24	-109.68	48.59	1276155.43	3243969.96	40.088145	-104.628015	0.73	99.28	-109.66	
3681.00	6.45	169.14	3675.71	-119.10	49.95	1276146.02	3243971.42	40.088119	-104.628010	0.71	284.40	-119.08	
3766.00	6.87	159.62	3760.14	-128.55	52.62	1276136.59	3243974.18	40.088093	-104.628001	1.39	286.05	-128.53	
3852.00	7.07	160.62	3845.50	-138.36	56.17	1276126.81	3243977.83	40.088066	-104.627988	0.27	31.74	-138.35	
3937.00	6.09	159.37	3929.94	-147.52	59.49	1276117.69	3243981.24	40.088041	-104.627976	1.17	187.70	-147.50	
4023.00	6.18	158.80	4015.45	-156.10	62.78	1276109.14	3243984.61	40.088017	-104.627965	0.13	325.62	-156.08	
4108.00	6.84	160.14	4099.90	-165.13	66.15	1276100.15	3243988.07	40.087993	-104.627953	0.80	13.63	-165.11	
4193.00	6.63	160.18	4184.31	-174.51	69.53	1276090.80	3243991.54	40.087967	-104.627940	0.25	178.74	-174.48	

5D Survey Report

Survey Points (Relative to centre, TVD relative to Well TVD Reference)													
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	Latitude (°)	Longitude (°)	DLS (°/100 US ft)	T.Face (°)	VS (US ft)	Comment
4279.00	5.59	159.30	4269.82	-183.10	72.70	1276082.25	3243994.79	40.087943	-104.627929	1.21	184.71	-183.07	
4364.00	5.80	148.46	4354.41	-190.63	76.41	1276074.75	3243998.58	40.087923	-104.627916	1.29	275.62	-190.60	
4450.00	7.60	148.13	4439.82	-199.16	81.68	1276066.27	3244003.94	40.087899	-104.627897	2.09	358.61	-199.14	
4536.00	7.15	151.09	4525.10	-208.68	87.27	1276056.81	3244009.62	40.087873	-104.627877	0.68	141.29	-208.65	
4621.00	6.83	149.33	4609.47	-217.66	92.41	1276047.88	3244014.84	40.087849	-104.627859	0.45	212.92	-217.62	
4706.00	6.69	150.61	4693.88	-226.32	97.42	1276039.27	3244019.94	40.087825	-104.627841	0.24	133.53	-226.28	
4792.00	6.66	151.42	4779.30	-235.06	102.26	1276030.57	3244024.87	40.087801	-104.627824	0.11	108.08	-235.03	
4877.00	5.85	151.52	4863.79	-243.20	106.68	1276022.48	3244029.37	40.087778	-104.627808	0.95	179.28	-243.16	
4963.00	5.00	148.99	4949.41	-250.26	110.70	1276015.46	3244033.46	40.087759	-104.627793	1.03	194.46	-250.22	
5048.00	4.65	147.82	5034.10	-256.35	114.45	1276009.40	3244037.26	40.087742	-104.627780	0.43	195.12	-256.31	
5133.00	4.36	157.52	5118.84	-262.26	117.52	1276003.53	3244040.39	40.087726	-104.627769	0.96	115.63	-262.21	
5218.00	5.05	157.98	5203.56	-268.71	120.16	1275997.11	3244043.09	40.087708	-104.627760	0.81	3.36	-268.67	
5304.00	4.90	150.37	5289.23	-275.41	123.39	1275990.44	3244046.39	40.087690	-104.627748	0.79	253.42	-275.37	
5389.00	4.14	147.91	5373.97	-281.17	126.82	1275984.71	3244049.87	40.087674	-104.627736	0.92	193.09	-281.12	
5474.00	3.71	148.29	5458.77	-286.10	129.89	1275979.81	3244053.00	40.087661	-104.627725	0.51	176.73	-286.06	
5560.00	1.83	138.84	5544.67	-289.51	132.26	1275976.43	3244055.40	40.087651	-104.627716	2.24	188.96	-289.46	
5645.00	1.17	155.48	5629.64	-291.32	133.51	1275974.63	3244056.67	40.087646	-104.627712	0.92	154.71	-291.27	
5731.00	0.82	158.66	5715.62	-292.69	134.10	1275973.26	3244057.27	40.087643	-104.627710	0.41	172.62	-292.64	
5901.00	1.09	106.29	5885.60	-294.28	136.09	1275971.70	3244059.28	40.087638	-104.627703	0.52	259.86	-294.23	
5987.00	0.98	101.92	5971.59	-294.66	137.60	1275971.33	3244060.79	40.087637	-104.627697	0.16	213.49	-294.61	
6072.00	0.56	148.73	6056.58	-295.16	138.53	1275970.83	3244061.72	40.087636	-104.627694	0.85	145.62	-295.11	
6158.00	0.30	143.01	6142.58	-295.70	138.88	1275970.30	3244062.08	40.087634	-104.627693	0.31	186.52	-295.65	
6243.00	0.14	133.55	6227.58	-295.95	139.09	1275970.05	3244062.29	40.087634	-104.627692	0.19	188.09	-295.90	
6328.00	0.21	214.47	6312.58	-296.15	139.08	1275969.85	3244062.28	40.087633	-104.627692	0.27	117.26	-296.10	
6414.00	0.30	172.20	6398.58	-296.50	139.02	1275969.50	3244062.23	40.087632	-104.627692	0.24	273.40	-296.46	
6499.00	0.42	202.06	6483.58	-297.01	138.93	1275968.99	3244062.14	40.087631	-104.627692	0.26	72.92	-296.96	
6585.00	0.63	216.57	6569.57	-297.68	138.53	1275968.31	3244061.75	40.087629	-104.627694	0.29	39.73	-297.64	
6663.00	3.07	336.08	6647.54	-296.12	137.43	1275969.87	3244060.63	40.087633	-104.627698	4.39	128.71	-296.07	
6748.00	12.13	358.59	6731.71	-285.09	136.28	1275980.89	3244059.38	40.087663	-104.627702	11.02	29.62	-285.04	
6834.00	19.00	0.72	6814.51	-262.03	136.24	1276003.94	3244059.11	40.087727	-104.627702	8.01	5.79	-261.98	
6919.00	25.70	359.15	6893.08	-229.73	136.14	1276036.24	3244058.69	40.087815	-104.627702	7.91	354.18	-229.68	
7004.00	31.88	355.77	6967.54	-188.87	134.21	1276077.08	3244056.36	40.087928	-104.627709	7.52	343.75	-188.82	
7090.00	42.05	357.69	7036.17	-137.31	131.36	1276128.61	3244053.01	40.088069	-104.627719	11.90	7.26	-137.26	
7175.00	50.27	355.46	7095.00	-76.17	127.62	1276189.70	3244048.66	40.088237	-104.627733	9.85	348.14	-76.13	
7260.00	61.21	356.09	7142.78	-6.22	122.48	1276259.61	3244042.83	40.088429	-104.627751	12.89	2.91	-6.18	
7303.00	67.18	357.79	7161.49	32.42	120.43	1276298.22	3244040.40	40.088535	-104.627759	14.33	14.76	32.46	
7346.00	71.37	358.73	7176.70	72.61	119.21	1276338.40	3244038.79	40.088645	-104.627763	9.96	12.02	72.65	
7389.00	73.50	359.79	7189.68	113.60	118.68	1276379.38	3244037.86	40.088758	-104.627765	5.48	25.54	113.64	
7431.00	76.25	0.74	7200.64	154.14	118.87	1276419.92	3244037.65	40.088869	-104.627764	6.90	18.57	154.18	
7474.00	78.12	1.85	7210.17	196.05	119.82	1276461.84	3244038.19	40.088984	-104.627761	5.02	30.19	196.10	
7517.00	83.42	1.49	7217.07	238.46	121.06	1276504.26	3244039.01	40.089101	-104.627756	12.35	356.13	238.51	

5D Survey Report

Survey Points (Relative to centre, TVD relative to Well TVD Reference)													
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	Latitude (°)	Longitude (°)	DLS (°/100 US ft)	T.Face (°)	VS (US ft)	Comment
7559.00	89.93	1.10	7219.50	280.36	122.00	1276546.17	3244039.54	40.089216	-104.627753	15.53	356.56	280.40	
7590.00	92.17	0.65	7218.93	311.35	122.48	1276577.16	3244039.71	40.089301	-104.627751	7.37	348.65	311.39	
7677.00	93.46	359.65	7214.66	398.24	122.71	1276664.05	3244039.08	40.089539	-104.627750	1.88	322.27	398.28	
7762.00	90.86	359.03	7211.46	483.17	121.73	1276748.96	3244037.27	40.089772	-104.627754	3.14	193.42	483.21	
7848.00	90.43	358.35	7210.49	569.14	119.76	1276834.91	3244034.46	40.090008	-104.627761	0.94	237.70	569.18	
7933.00	89.91	358.01	7210.24	654.10	117.06	1276919.83	3244030.92	40.090242	-104.627771	0.73	213.18	654.14	
8018.00	89.20	356.39	7210.90	738.99	112.91	1277004.68	3244025.94	40.090475	-104.627785	2.08	246.33	739.03	
8104.00	89.21	358.18	7212.09	824.88	108.84	1277090.53	3244021.02	40.090710	-104.627800	2.08	89.69	824.92	
8189.00	88.85	359.95	7213.53	909.85	107.45	1277175.48	3244018.80	40.090944	-104.627805	2.12	101.51	909.89	
8275.00	90.18	359.77	7214.26	995.85	107.24	1277261.47	3244017.74	40.091180	-104.627806	1.56	352.29	995.88	
8360.00	89.88	358.73	7214.21	1080.84	106.13	1277346.45	3244015.79	40.091413	-104.627810	1.27	253.91	1080.88	
8445.00	90.68	359.92	7213.80	1165.83	105.13	1277431.43	3244013.96	40.091646	-104.627813	1.69	56.09	1165.87	
8530.00	90.79	359.24	7212.71	1250.82	104.50	1277516.41	3244012.50	40.091880	-104.627815	0.81	279.19	1250.86	
8616.00	89.75	0.65	7212.30	1336.82	104.42	1277602.40	3244011.57	40.092116	-104.627816	2.04	126.41	1336.85	
8701.00	89.57	359.59	7212.81	1421.81	104.60	1277687.39	3244010.91	40.092349	-104.627815	1.26	260.36	1421.85	
8787.00	89.56	1.36	7213.46	1507.80	105.31	1277773.39	3244010.78	40.092585	-104.627813	2.06	90.33	1507.84	
8872.00	89.88	0.44	7213.88	1592.79	106.65	1277858.38	3244011.28	40.092818	-104.627808	1.15	289.18	1592.83	
8957.00	90.35	0.30	7213.71	1677.79	107.20	1277943.38	3244010.99	40.093052	-104.627806	0.58	343.41	1677.83	
9043.00	89.94	0.56	7213.49	1763.79	107.84	1278029.38	3244010.79	40.093288	-104.627804	0.56	147.62	1763.82	
9128.00	89.57	0.86	7213.85	1848.78	108.89	1278114.38	3244011.01	40.093521	-104.627800	0.56	140.97	1848.82	
9214.00	89.14	0.99	7214.82	1934.76	110.28	1278200.37	3244011.55	40.093757	-104.627795	0.52	163.18	1934.80	
9299.00	90.74	0.19	7214.91	2019.75	111.16	1278285.37	3244011.59	40.093991	-104.627792	2.10	333.43	2019.79	
9384.00	90.37	359.81	7214.09	2104.75	111.16	1278370.36	3244010.76	40.094224	-104.627792	0.62	225.76	2104.79	
9470.00	89.81	358.90	7213.95	2190.74	110.19	1278456.34	3244008.94	40.094460	-104.627795	1.24	238.39	2190.78	
9555.00	88.77	357.99	7215.00	2275.70	107.88	1278541.27	3244005.80	40.094693	-104.627803	1.63	221.18	2275.74	
9640.00	89.01	359.46	7216.65	2360.66	105.99	1278626.21	3244003.08	40.094926	-104.627810	1.75	80.74	2360.70	
9726.00	90.62	359.91	7216.93	2446.66	105.52	1278712.20	3244001.76	40.095162	-104.627812	1.94	15.62	2446.69	
9811.00	89.63	358.85	7216.74	2531.65	104.60	1278797.18	3244000.00	40.095396	-104.627815	1.71	226.96	2531.69	
9896.00	90.26	359.77	7216.82	2616.64	103.58	1278882.16	3243998.14	40.095629	-104.627819	1.31	55.60	2616.68	
9982.00	89.51	359.29	7217.00	2702.64	102.87	1278968.14	3243996.59	40.095865	-104.627821	1.04	212.62	2702.67	
10067.00	89.82	359.64	7217.49	2787.63	102.08	1279053.12	3243994.96	40.096099	-104.627824	0.55	48.47	2787.67	
10152.00	90.06	358.66	7217.58	2872.62	100.82	1279138.10	3243992.87	40.096332	-104.627829	1.19	283.76	2872.66	
10238.00	88.89	359.18	7218.37	2958.60	99.19	1279224.05	3243990.40	40.096568	-104.627834	1.49	156.04	2958.64	
10323.00	89.63	1.29	7219.47	3043.59	99.54	1279309.04	3243989.91	40.096801	-104.627833	2.63	70.69	3043.62	
10409.00	90.43	1.58	7219.42	3129.56	101.70	1279395.03	3243991.22	40.097037	-104.627825	0.99	19.93	3129.60	
10485.00	90.55	1.29	7218.77	3205.53	103.60	1279471.02	3243992.38	40.097246	-104.627819	0.41	292.48	3205.57	
10570.00	90.06	1.60	7218.32	3290.51	105.74	1279556.01	3243993.68	40.097479	-104.627811	0.68	147.68	3290.54	
10656.00	90.43	0.78	7217.95	3376.49	107.53	1279642.00	3243994.63	40.097715	-104.627805	1.05	294.29	3376.52	
10741.00	89.94	0.29	7217.68	3461.48	108.32	1279727.00	3243994.58	40.097948	-104.627802	0.82	225.00	3461.52	
10826.00	89.20	359.49	7218.32	3546.48	108.16	1279811.99	3243993.58	40.098182	-104.627802	1.28	227.23	3546.52	
10912.00	88.40	358.33	7220.12	3632.44	106.53	1279897.93	3243991.10	40.098418	-104.627808	1.64	235.39	3632.48	

5D Survey Report

Survey Points (Relative to centre, TVD relative to Well TVD Reference)													
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	Latitude (°)	Longitude (°)	DLS (°/100 US ft)	T.Face (°)	VS (US ft)	Comment
10997.00	89.82	359.07	7221.44	3717.41	104.60	1279982.87	3243988.34	40.098651	-104.627815	1.88	27.53	3717.44	
11082.00	90.25	359.74	7221.39	3802.40	103.71	1280067.86	3243986.62	40.098884	-104.627818	0.94	57.31	3802.44	
11168.00	88.33	358.71	7222.45	3888.38	102.55	1280153.82	3243984.61	40.099120	-104.627822	2.53	208.21	3888.42	
11253.00	87.66	357.84	7225.43	3973.29	99.99	1280238.70	3243981.22	40.099353	-104.627832	1.29	232.37	3973.32	
11339.00	88.40	357.89	7228.38	4059.18	96.79	1280324.55	3243977.18	40.099589	-104.627843	0.86	3.86	4059.21	
11412.00	89.94	359.03	7229.44	4132.14	94.83	1280397.49	3243974.50	40.099789	-104.627850	2.62	36.52	4132.17	
11497.00	90.31	359.99	7229.25	4217.14	94.10	1280482.48	3243972.93	40.100023	-104.627853	1.21	68.92	4217.17	
11582.00	92.64	0.83	7227.07	4302.10	94.71	1280567.44	3243972.71	40.100256	-104.627850	2.91	19.81	4302.13	
11668.00	92.56	1.01	7223.17	4388.00	96.09	1280653.35	3243973.24	40.100492	-104.627846	0.23	113.98	4388.03	
11753.00	93.46	2.31	7218.70	4472.84	98.55	1280738.22	3243974.87	40.100725	-104.627837	1.86	55.24	4472.88	
11838.00	93.64	3.25	7213.44	4557.58	102.66	1280822.99	3243978.15	40.100957	-104.627822	1.12	79.11	4557.62	
11924.00	90.80	2.30	7210.11	4643.41	106.82	1280908.85	3243981.46	40.101193	-104.627807	3.48	198.50	4643.44	
12009.00	88.83	1.67	7210.38	4728.35	109.77	1280993.82	3243983.57	40.101426	-104.627797	2.43	197.73	4728.39	
12095.00	89.88	1.80	7211.35	4814.30	112.37	1281079.80	3243985.33	40.101662	-104.627787	1.23	7.06	4814.34	
12180.00	87.28	357.72	7213.46	4899.25	112.02	1281164.74	3243984.14	40.101895	-104.627789	5.69	237.45	4899.29	
12264.00	88.15	354.81	7216.81	4983.00	106.55	1281248.42	3243977.85	40.102125	-104.627808	3.61	286.60	4983.03	
12349.00	88.95	354.66	7218.96	5067.61	98.75	1281332.96	3243969.22	40.102357	-104.627836	0.96	349.38	5067.64	
12435.00	87.84	353.94	7221.37	5153.15	90.21	1281418.41	3243959.84	40.102592	-104.627867	1.54	212.95	5153.18	
12520.00	87.59	354.72	7224.76	5237.67	81.82	1281502.84	3243950.62	40.102824	-104.627897	0.96	107.80	5237.69	
12605.00	90.68	356.80	7226.04	5322.41	75.54	1281587.51	3243943.50	40.103057	-104.627919	4.38	33.96	5322.43	
12691.00	91.42	357.18	7224.46	5408.27	71.03	1281673.33	3243938.15	40.103293	-104.627935	0.97	27.17	5408.30	
12776.00	92.04	358.97	7221.90	5493.18	68.17	1281758.21	3243934.46	40.103526	-104.627945	2.23	70.86	5493.21	
12861.00	91.30	0.40	7219.42	5578.14	67.71	1281843.16	3243933.15	40.103759	-104.627947	1.89	117.35	5578.17	
12947.00	89.82	0.98	7218.58	5664.13	68.74	1281929.15	3243933.34	40.103995	-104.627943	1.85	158.60	5664.15	
13032.00	89.51	1.04	7219.08	5749.12	70.24	1282014.15	3243934.01	40.104228	-104.627938	0.37	169.05	5749.14	
13118.00	88.40	1.85	7220.64	5835.07	72.41	1282100.12	3243935.33	40.104464	-104.627930	1.60	143.89	5835.10	
13203.00	89.32	1.60	7222.33	5920.02	74.97	1282185.09	3243937.05	40.104697	-104.627921	1.12	344.80	5920.04	
13289.00	90.18	1.89	7222.71	6005.97	77.58	1282271.07	3243938.83	40.104933	-104.627912	1.06	18.64	6006.00	
13374.00	88.71	1.56	7223.53	6090.93	80.14	1282356.04	3243940.55	40.105167	-104.627903	1.77	192.65	6090.96	
13460.00	89.12	1.71	7225.16	6176.88	82.60	1282442.01	3243942.16	40.105403	-104.627894	0.51	20.09	6176.91	
13545.00	90.18	1.36	7225.68	6261.84	84.87	1282527.00	3243943.60	40.105636	-104.627886	1.31	341.73	6261.87	
13631.00	90.00	1.20	7225.55	6347.82	86.79	1282612.99	3243944.67	40.105872	-104.627879	0.28	221.63	6347.85	
13716.00	90.68	0.92	7225.04	6432.81	88.37	1282697.98	3243945.41	40.106105	-104.627873	0.87	337.62	6432.84	
13801.00	89.44	0.98	7224.95	6517.79	89.78	1282782.98	3243945.98	40.106338	-104.627868	1.46	177.23	6517.82	
13887.00	90.06	1.40	7225.33	6603.77	91.56	1282868.97	3243946.93	40.106574	-104.627862	0.87	34.12	6603.80	
13972.00	90.86	1.89	7224.65	6688.73	94.00	1282953.96	3243948.53	40.106808	-104.627853	1.10	31.49	6688.77	
14058.00	90.43	2.10	7223.68	6774.68	97.00	1283039.92	3243950.68	40.107044	-104.627842	0.56	153.97	6774.71	
14143.00	90.00	359.80	7223.36	6859.66	98.40	1283124.91	3243951.25	40.107277	-104.627837	2.75	259.42	6859.69	
14228.00	88.94	359.07	7224.14	6944.65	97.57	1283209.89	3243949.58	40.107510	-104.627840	1.51	214.55	6944.68	
14314.00	90.43	1.34	7224.62	7030.64	97.87	1283295.88	3243949.04	40.107746	-104.627839	3.16	56.73	7030.67	
14398.00	90.74	1.56	7223.76	7114.61	100.00	1283379.87	3243950.34	40.107977	-104.627832	0.45	35.36	7114.64	

5D Survey Report

Survey Points (Relative to centre, TVD relative to Well TVD Reference)													
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N. Offset (US ft)	E. Offset (US ft)	Northing (US ft)	Easting (US ft)	Latitude (°)	Longitude (°)	DLS (°/100 US ft)	T.Face (°)	VS (US ft)	Comment
14484.00	90.53	1.36	7222.81	7200.57	102.19	1283465.85	3243951.69	40.108213	-104.627824	0.34	223.60	7200.61	
14569.00	89.38	359.03	7222.87	7285.57	102.48	1283550.84	3243951.14	40.108446	-104.627823	3.06	243.73	7285.60	
14654.00	89.45	0.47	7223.74	7370.56	102.11	1283635.83	3243949.93	40.108679	-104.627824	1.70	87.22	7370.59	
14740.00	90.00	2.89	7224.15	7456.51	104.63	1283721.80	3243951.61	40.108915	-104.627815	2.89	77.20	7456.55	
14825.00	88.03	1.03	7225.62	7541.44	107.54	1283806.76	3243953.68	40.109148	-104.627805	3.19	223.34	7541.48	
14911.00	88.64	1.95	7228.11	7627.38	109.77	1283892.71	3243955.07	40.109384	-104.627797	1.28	56.46	7627.42	
14996.00	88.03	1.58	7230.58	7712.30	112.39	1283977.65	3243956.85	40.109617	-104.627787	0.84	211.22	7712.34	
15081.00	87.53	2.01	7233.88	7797.19	115.05	1284062.57	3243958.68	40.109851	-104.627778	0.78	139.33	7797.23	
15167.00	87.47	0.93	7237.63	7883.08	117.25	1284148.48	3243960.04	40.110086	-104.627770	1.26	266.79	7883.12	
15252.00	89.20	1.69	7240.10	7968.02	119.20	1284233.43	3243961.14	40.110319	-104.627763	2.22	23.72	7968.06	
15338.00	88.71	0.53	7241.67	8053.99	120.86	1284319.41	3243961.96	40.110555	-104.627757	1.46	247.09	8054.03	
15423.00	89.63	0.53	7242.90	8138.98	121.65	1284404.40	3243961.92	40.110789	-104.627754	1.08	0.00	8139.02	
15508.00	91.11	0.79	7242.35	8223.97	122.63	1284489.39	3243962.06	40.111022	-104.627751	1.77	9.96	8224.01	
15593.00	91.23	1.38	7240.61	8308.93	124.24	1284574.37	3243962.83	40.111255	-104.627745	0.71	78.50	8308.98	
15678.00	91.23	1.72	7238.79	8393.88	126.54	1284659.34	3243964.30	40.111489	-104.627737	0.40	90.00	8393.93	
15764.00	91.36	1.88	7236.84	8479.82	129.24	1284745.30	3243966.15	40.111724	-104.627727	0.24	50.90	8479.86	
15849.00	90.88	1.36	7235.18	8564.77	131.64	1284830.27	3243967.72	40.111958	-104.627718	0.83	227.29	8564.81	
15935.00	90.06	0.21	7234.48	8650.75	132.82	1284916.26	3243968.05	40.112194	-104.627714	1.64	234.51	8650.80	
16020.00	89.26	0.14	7234.98	8735.75	133.08	1285001.26	3243967.47	40.112427	-104.627713	0.94	185.00	8735.80	
16105.00	89.94	0.36	7235.58	8820.75	133.45	1285086.25	3243967.01	40.112660	-104.627712	0.84	17.93	8820.79	
16191.00	90.00	0.65	7235.62	8906.74	134.21	1285172.25	3243966.92	40.112896	-104.627709	0.34	78.31	8906.79	
16276.00	90.35	0.48	7235.36	8991.74	135.04	1285257.25	3243966.92	40.113130	-104.627706	0.46	334.09	8991.79	
16362.00	91.06	0.65	7234.30	9077.73	135.89	1285343.25	3243966.93	40.113366	-104.627703	0.85	13.46	9077.77	
16447.00	90.71	0.65	7232.99	9162.71	136.86	1285428.23	3243967.06	40.113599	-104.627700	0.41	180.00	9162.76	
16533.00	90.37	0.43	7232.18	9248.70	137.67	1285514.23	3243967.02	40.113835	-104.627697	0.47	212.91	9248.75	
16618.00	89.32	359.50	7232.41	9333.70	137.61	1285599.22	3243966.13	40.114068	-104.627697	1.65	221.53	9333.75	
16704.00	89.94	0.78	7232.96	9419.70	137.82	1285685.22	3243965.50	40.114305	-104.627696	1.65	64.16	9419.75	
16789.00	90.93	0.49	7232.32	9504.69	138.77	1285770.21	3243965.60	40.114538	-104.627693	1.21	343.67	9504.74	
16875.00	90.93	0.57	7230.92	9590.67	139.56	1285856.20	3243965.55	40.114774	-104.627690	0.09	90.00	9590.72	
16960.00	90.37	0.33	7229.96	9675.67	140.23	1285941.20	3243965.39	40.115007	-104.627688	0.72	203.20	9675.71	
17075.00	89.63	359.99	7229.96	9790.66	140.55	1286056.19	3243964.58	40.115323	-104.627686	0.71	204.68	9790.71	LAST MWD+IFR SURVEY
17129.00	89.63	359.99	7230.31	9844.66	140.54	1286110.19	3243964.04	40.115471	-104.627687	0.00	0.00	9844.71	Projection TD

Formation Points (Relative to centre, TVD relative to Well TVD Reference)			
Name	MD (US ft)	TVD (US ft)	
FOX HILLS	816.04	816.00	
SUSSEX	4982.67	4969.00	
SHARON SPRINGS	6904.55	6880.00	
NIOBRARA A	6932.28	6905.00	
NIOBRARA B	7017.61	6979.00	

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Formation Points (Relative to centre, TVD relative to Well TVD Reference)	Name	MD (US ft)	TVD (US ft)
	NIOBRARA C	7124.35	7061.00
	FORT HAYS	7432.53	7201.00
	CODELL	11186.04	7223.00