



Wellhead Details

Name	Northing	Easting	Latitude	Longitude	North	East	Elevation Above Inst.
Long 22-15-2NBH	1259764.1926	3237752.8073	40.04331600	-104.65079600	12.30S	8.52E	-0.00

Declination

Date	Source	Time
9-Jan-2015		09:02

Installation Details

Name	Northing	Easting	Coord System Name	North Alignment
Long Pad	1259776.4969	3237744.2898	CO83-NF on NORTH AMERICAN DATUM 1983 datum	Grid

Summary Wellpath

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Northing	Easting
6614.00	0.00	330.500	6599.80	335.70N	189.96W		344.65	1260099.88	3237562.85
11784.06	90.34	359.270	7171.00	5155.42N	254.01W	==>	5161.67	1264919.41	3237498.81

Interpolated Wellpath

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
0.00	0.00	0.000	0.00	0.00N	0.00E		0.00	Rig Datum
25.00	0.00	0.000	25.00	0.00N	0.00E	==>	0.00	Slot Datum
100.00	0.00	0.000	100.00	0.00N	0.00E	==>	0.00	
200.00	0.00	0.000	200.00	0.00N	0.00E	==>	0.00	
300.00	0.00	0.000	300.00	0.00N	0.00E	==>	0.00	
400.00	0.00	0.000	400.00	0.00N	0.00E	==>	0.00	
500.00	0.00	0.000	500.00	0.00N	0.00E	==>	0.00	
600.00	0.00	0.000	600.00	0.00N	0.00E	==>	0.00	
700.00	0.00	0.000	700.00	0.00N	0.00E	==>	0.00	
800.00	0.00	0.000	800.00	0.00N	0.00E	==>	0.00	
900.00	0.00	0.000	900.00	0.00N	0.00E	==>	0.00	
1000.00	0.00	0.000	1000.00	0.00N	0.00E	==>	0.00	
1100.00	0.00	0.000	1100.00	0.00N	0.00E	==>	0.00	
1200.00	0.00	0.000	1200.00	0.00N	0.00E	==>	0.00	9 5/8in Surface Casing
1300.00	1.50	330.500	1299.99	0.85N	0.48W	2.00	0.88	
1400.00	3.50	330.500	1399.89	4.65N	2.63W	2.00	4.77	
1500.00	4.27	330.500	1499.63	10.91N	6.17W	==>	11.20	
1600.00	4.27	330.500	1599.35	17.40N	9.84W	==>	17.86	
1700.00	4.27	330.500	1699.08	23.88N	13.51W	==>	24.52	
1800.00	4.27	330.500	1798.80	30.37N	17.18W	==>	31.18	
1900.00	4.27	330.500	1898.52	36.85N	20.85W	==>	37.84	
2000.00	4.27	330.500	1998.24	43.34N	24.53W	==>	44.50	
2100.00	4.27	330.500	2097.96	49.83N	28.20W	==>	51.15	
2200.00	4.27	330.500	2197.68	56.31N	31.87W	==>	57.81	
2300.00	4.27	330.500	2297.41	62.80N	35.54W	==>	64.47	
2400.00	4.27	330.500	2397.13	69.29N	39.21W	==>	71.13	
2500.00	4.27	330.500	2496.85	75.77N	42.88W	==>	77.79	
2600.00	4.27	330.500	2596.57	82.26N	46.55W	==>	84.45	
2700.00	4.27	330.500	2696.29	88.75N	50.22W	==>	91.11	
2800.00	4.27	330.500	2796.02	95.23N	53.89W	==>	97.77	
2900.00	4.27	330.500	2895.74	101.72N	57.56W	==>	104.43	
3000.00	4.27	330.500	2995.46	108.20N	61.23W	==>	111.09	
3100.00	4.27	330.500	3095.18	114.69N	64.90W	==>	117.75	
3200.00	4.27	330.500	3194.90	121.18N	68.57W	==>	124.40	
3300.00	4.27	330.500	3294.63	127.66N	72.24W	==>	131.06	
3400.00	4.27	330.500	3394.35	134.15N	75.91W	==>	137.72	
3500.00	4.27	330.500	3494.07	140.64N	79.58W	==>	144.38	
3600.00	4.27	330.500	3593.79	147.12N	83.25W	==>	151.04	
3700.00	4.27	330.500	3693.51	153.61N	86.92W	==>	157.70	
3800.00	4.27	330.500	3793.24	160.09N	90.59W	==>	164.36	

All data is in Feet unless otherwise stated
Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 5077.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 357.180 degrees
Bottom hole distance is 5161.67 Feet on azimuth 357.18 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 2-Apr-2015



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
3900.00	4.27	330.500	3892.96	166.58N	94.26W	==>	171.02	
4000.00	4.27	330.500	3992.68	173.07N	97.93W	==>	177.68	
4100.00	4.27	330.500	4092.40	179.55N	101.60W	==>	184.34	
4200.00	4.27	330.500	4192.12	186.04N	105.27W	==>	190.99	
4300.00	4.27	330.500	4291.84	192.53N	108.94W	==>	197.65	
4400.00	4.27	330.500	4391.57	199.01N	112.61W	==>	204.31	
4500.00	4.27	330.500	4491.29	205.50N	116.28W	==>	210.97	
4600.00	4.27	330.500	4591.01	211.98N	119.95W	==>	217.63	
4700.00	4.27	330.500	4690.73	218.47N	123.62W	==>	224.29	
4800.00	4.27	330.500	4790.45	224.96N	127.29W	==>	230.95	
4900.00	4.27	330.500	4890.18	231.44N	130.96W	==>	237.61	
5000.00	4.27	330.500	4989.90	237.93N	134.63W	==>	244.27	
5100.00	4.27	330.500	5089.62	244.42N	138.30W	==>	250.93	
5200.00	4.27	330.500	5189.34	250.90N	141.98W	==>	257.59	
5300.00	4.27	330.500	5289.06	257.39N	145.65W	==>	264.24	
5400.00	4.27	330.500	5388.79	263.88N	149.32W	==>	270.90	
5500.00	4.27	330.500	5488.51	270.36N	152.99W	==>	277.56	
5600.00	4.27	330.500	5588.23	276.85N	156.66W	==>	284.22	
5700.00	4.27	330.500	5687.95	283.33N	160.33W	==>	290.88	
5800.00	4.27	330.500	5787.67	289.82N	164.00W	==>	297.54	
5900.00	4.27	330.500	5887.39	296.31N	167.67W	==>	304.20	
6000.00	4.27	330.500	5987.12	302.79N	171.34W	==>	310.86	
6100.00	4.27	330.500	6086.84	309.28N	175.01W	==>	317.52	
6200.00	4.27	330.500	6186.56	315.77N	178.68W	==>	324.18	
6300.00	4.27	330.500	6286.28	322.25N	182.35W	==>	330.83	
6400.00	4.27	330.500	6386.00	328.74N	186.02W	==>	337.49	
6500.00	2.28	330.500	6485.84	333.72N	188.84W	2.00	342.61	
6600.00	0.28	330.500	6585.80	335.67N	189.94W	2.00	344.61	
6614.00	0.00	330.500	6599.80	335.70N	189.96W	==>	344.65	Sidetrack Tie
6714.00	7.68	357.330	6699.57	341.29N	190.46W	10.00	350.25	
6814.00	17.68	358.450	6797.01	363.19N	191.19W	10.00	372.16	
6914.00	27.68	358.770	6889.16	401.69N	192.10W	10.00	410.65	
7014.00	37.67	358.930	6973.23	455.59N	193.17W	10.00	464.55	
7114.00	47.67	359.030	7046.66	523.28N	194.37W	10.00	532.21	
7214.00	57.67	359.100	7107.21	602.69N	195.66W	10.00	611.59	
7314.00	67.67	359.160	7153.06	691.41N	197.00W	10.00	700.27	7.0in Intermediate Casing
7398.00	76.07	359.200	7179.17	771.16N	198.13W	10.00	779.98	
7414.00	77.67	359.210	7182.80	786.74N	198.35W	10.00	795.55	
7514.00	87.67	359.260	7195.54	885.79N	199.67W	10.00	894.54	
7614.00	90.34	359.270	7195.57	985.77N	200.95W	==>	994.47	
7714.00	90.34	359.270	7194.98	1085.76N	202.22W	==>	1094.40	
7814.00	90.34	359.270	7194.39	1185.75N	203.49W	==>	1194.33	
7914.00	90.34	359.270	7193.80	1285.74N	204.76W	==>	1294.26	
8014.00	90.34	359.270	7193.21	1385.73N	206.04W	==>	1394.20	
8114.00	90.34	359.270	7192.62	1485.73N	207.31W	==>	1494.13	
8214.00	90.34	359.270	7192.03	1585.72N	208.58W	==>	1594.06	
8314.00	90.34	359.270	7191.44	1685.71N	209.85W	==>	1693.99	
8414.00	90.34	359.270	7190.85	1785.70N	211.13W	==>	1793.92	
8514.00	90.34	359.270	7190.27	1885.69N	212.40W	==>	1893.85	
8614.00	90.34	359.270	7189.68	1985.68N	213.67W	==>	1993.79	
8714.00	90.34	359.270	7189.09	2085.67N	214.94W	==>	2093.72	
8814.00	90.34	359.270	7188.50	2185.66N	216.22W	==>	2193.65	
8914.00	90.34	359.270	7187.91	2285.65N	217.49W	==>	2293.58	
9014.00	90.34	359.270	7187.32	2385.64N	218.76W	==>	2393.51	
9114.00	90.34	359.270	7186.73	2485.63N	220.03W	==>	2493.44	
9214.00	90.34	359.270	7186.14	2585.62N	221.31W	==>	2593.37	
9314.00	90.34	359.270	7185.55	2685.61N	222.58W	==>	2693.31	
9414.00	90.34	359.270	7184.96	2785.60N	223.85W	==>	2793.24	
9514.00	90.34	359.270	7184.37	2885.59N	225.12W	==>	2893.17	

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Bottom hole distance is 5161.67 Feet on azimuth 357.18 degrees from Wellhead
Calculation method uses Minimum Curvature method
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Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
9614.00	90.34	359.270	7183.78	2985.58N	226.40W	==>	2993.10	
9714.00	90.34	359.270	7183.20	3085.57N	227.67W	==>	3093.03	
9814.00	90.34	359.270	7182.61	3185.56N	228.94W	==>	3192.96	
9914.00	90.34	359.270	7182.02	3285.55N	230.21W	==>	3292.90	
10014.00	90.34	359.270	7181.43	3385.54N	231.49W	==>	3392.83	
10114.00	90.34	359.270	7180.84	3485.53N	232.76W	==>	3492.76	
10214.00	90.34	359.270	7180.25	3585.52N	234.03W	==>	3592.69	
10314.00	90.34	359.270	7179.66	3685.51N	235.30W	==>	3692.62	
10414.00	90.34	359.270	7179.07	3785.50N	236.58W	==>	3792.55	
10514.00	90.34	359.270	7178.48	3885.49N	237.85W	==>	3892.49	
10614.00	90.34	359.270	7177.89	3985.48N	239.12W	==>	3992.42	
10714.00	90.34	359.270	7177.30	4085.47N	240.39W	==>	4092.35	
10814.00	90.34	359.270	7176.72	4185.46N	241.67W	==>	4192.28	
10914.00	90.34	359.270	7176.13	4285.45N	242.94W	==>	4292.21	
11014.00	90.34	359.270	7175.54	4385.44N	244.21W	==>	4392.14	
11114.00	90.34	359.270	7174.95	4485.43N	245.48W	==>	4492.08	
11214.00	90.34	359.270	7174.36	4585.42N	246.76W	==>	4592.01	
11314.00	90.34	359.270	7173.77	4685.41N	248.03W	==>	4691.94	
11414.00	90.34	359.270	7173.18	4785.40N	249.30W	==>	4791.87	
11514.00	90.34	359.270	7172.59	4885.39N	250.57W	==>	4891.80	
11614.00	90.34	359.270	7172.00	4985.38N	251.85W	==>	4991.73	
11714.00	90.34	359.270	7171.41	5085.37N	253.12W	==>	5091.67	
11784.00	90.34	359.270	7171.00	5155.36N	254.01W	==>	5161.62	4 1/2in Production Liner
11784.06	90.34	359.270	7171.00	5155.42N	254.01W	==>	5161.67	



Hole Sections

Diameter [in]	Start MD[ft]	Start TVD[ft]	Start North[ft]	Start East[ft]	End MD[ft]	End TVD[ft]	End North[ft]	End East[ft]
13 1/2	25.00	25.00	0.00N	0.00E	1200.00	1200.00	0.00N	0.00E
8 3/4	1200.00	1200.00	0.00N	0.00E	6614.00	6599.80	335.70N	189.96W
8 3/4	6614.00	6599.80	335.70N	189.96W	7398.00	7179.17	771.16N	198.13W
6 1/8	7398.00	7179.17	771.16N	198.13W	11784.00	7171.00	5155.36N	254.01W

Casings

Name	Top MD[ft]	Top TVD[ft]	Top North[ft]	Top East[ft]	Shoe MD[ft]	Shoe TVD[ft]	Shoe North[ft]	Shoe East[ft]
9 5/8in Surface Casing	25.00	25.00	0.00N	0.00E	1200.00	1200.00	0.00N	0.00E
7.0in Intermediate Casing	25.00	25.00	0.00N	0.00E	7398.00	7179.17	771.16N	198.13W
4 1/2in Production Liner	6626.00	6611.80	335.83N	189.99W	11784.00	7171.00	5155.36N	254.01W

Targets

Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting	Last Revised
Long 22-15-2NBH - T1	770.41N	200.01W	7196.00	40.04543600	-104.65148400	1260534.58	3237552.80	19-Mar-2015
Long 22-15-2NBH - T2	5155.42N	254.01W	7171.00	40.05747400	-104.65152700	1264919.41	3237498.81	19-Mar-2015

Survey Tool Program

Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model
364939	Planned	6614.00	6599.80	WdW Rate Gyro	Standard
362555	Planned	11784.06	7171.00	WdW Rate Gyro	Standard

Notes

SYSDRILL
Closest Approach + Clearance Factor Summary Report
Wellbore: Long 22-15-2NBH ST



Ellipse separations are reported ONLY if BOTH wells have uncertainty data
Only Depth and Magnetic Reference Field error terms are correlated across tie points
Proximities beyond 2500.00ft with expansion rate of 0.00ft/1000ft are not reported
Scan limit is calculated on CENTRE to CENTRE distance

Summary data uses Closest Approach clearance calculation for all minima
Hole size/Casings ARE included
Hole size/Casings are NOT subtracted from Centre-Centre distance
Confidence limit of 95.00% / 2.80 SD.

Wellbore		
Name	Created	Last Revised
Long 22-15-2NBH ST	19-Mar-2015	2-Apr-2015

Well		
Name	Government ID	Last Revised
Long 22-15-2NBH		19-Mar-2015

Slot						
Name	Grid Northing	Grid Easting	Latitude	Longitude	North	East
Long 22-15-2NBH	1259764.1926	3237752.8073	40.04331600	-104.65079600	12.30S	8.52E

Installation				
Name	Easting	Northing	Coord System Name	North Alignment
Long Pad	3237744.2898	1259776.4969	CO83-NF on NORTH AMERICAN DATUM 1983 datum	Grid

Field				
Name	Easting	Northing	Coord System Name	North Alignment
Wattenberg	3224403.5855	1243770.7568	CO83-NF on NORTH AMERICAN DATUM 1983 datum	Grid

Clearance Summary							
Offset WellName	Separation [ft]	MD[ft]	Diverging From[ft]	Ellipse Separation [ft]	Ellipse MD[ft]	Clearance Factor	Clearance MD[ft]
Long 22-15-2NBH	0.00	6614.00	6614.00	0.15	6648.62	1.34	6648.62
Long 22-15-1CH	146.13	6717.91	6717.91	133.32	6734.32	11.25	6814.00
Long 22-15-1CH	146.49	6614.00	6614.00	133.56	6619.49	4.91	11770.41
Long 22-15-6NCH	367.06	6614.00	11782.48	297.51	11782.48	4.49	11782.48
Long 22-15-6NCH	367.06	6614.00	6614.00	354.71	6614.00	29.51	6783.53
Long 22-15-8NCH	380.09	11784.06	11784.06	291.84	11770.41	4.31	11770.41
Long 22-15-7NBH	716.98	6614.00	11784.06	664.93	11770.41	8.46	11770.41
Long 22-15-12NBH	744.77	6614.00	6614.00	665.26	11770.41	8.47	11770.41
Long 22-15-13CH	849.73	6614.00	7540.63	837.58	6614.00	10.71	11770.41
Ottesen #3K-3H-L165	945.94	11784.06	11784.06	924.49	11784.06	43.88	11770.41
Ottesen #3J-3H-L165	957.04	11784.06	11784.06	930.02	11784.06	35.43	11784.06
Ottesen #3L-3H-L165	959.27	11784.06	11784.06	921.39	11784.06	25.32	11784.06
Long 22-15 11NCH	1007.08	6614.00	9178.54	993.85	6614.00	12.76	11770.41
LONG 22-15-5CH	1031.73	6614.00	11784.06	1018.38	6614.00	13.91	11770.41
Long 22-15-14NCH	1050.24	6614.00	7540.63	1037.85	6614.00	12.69	11770.41
Ottesen #3I-3H-L165	1054.79	11784.06	11784.06	1009.41	11784.06	23.24	11784.06
Ottesen #3H-3H-L165	1192.99	11784.06	11784.06	1130.59	11784.06	19.12	11784.06
LONG 22-15-4NBH	1308.38	6614.00	11784.06	1294.83	6614.00	16.83	11770.41
Ottesen #3G-3H-L165	1335.41	11784.06	11784.06	1260.20	11784.06	17.76	11784.06
Long 22-15-15NBH	1365.88	6614.00	6614.00	1353.18	6614.00	16.86	11770.41
Drake #01N-65W-22-1C	1368.96	7047.65	7047.65	1330.73	7047.65	35.79	7029.59

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SYSDRILL
Closest Approach + Clearance Factor Summary Report
Wellbore: Long 22-15-2NBH ST



Clearance Summary							
Offset WellName	Separation [ft]	MD[ft]	Diverging From[ft]	Ellipse Separation [ft]	Ellipse MD[ft]	Clearance Factor	Clearance MD[ft]
Drake #01N-65W-22-2N	1437.36	6984.52	6984.52	1395.63	6984.52	34.44	6963.98
Ottesen #3F-3H-L165	1500.24	11784.06	11784.06	1418.08	11784.06	18.26	11784.06
LONG 22-15-3NCH	1568.45	6614.00	11784.06	1554.71	6614.00	21.02	11770.41
Drake #01N-65W-22-3N	1581.61	6983.34	6983.34	1538.34	6983.34	36.55	6980.38
Long 22-15-16NCH	1644.86	6614.00	7540.63	1631.90	6614.00	21.05	11770.41
Long 22-15-17CH	1667.48	6614.00	7540.63	1654.48	6614.00	22.13	11770.41
Ottesen #3E-3H-L165	1689.86	11784.06	11784.06	1601.66	11784.06	19.16	11784.06
Drake #01N-65W-22-4N	1730.17	6982.34	6982.34	1685.67	6982.34	38.88	6982.34
Long 22-15-9CH	1787.55	6614.00	11784.06	1773.95	6614.00	25.59	11770.41
Long 22-15-10NBH	1844.37	6614.00	11784.06	1830.75	6614.00	25.34	11770.41
Ottesen #3D-3H-L165	1880.23	11784.06	11784.06	1786.84	11784.06	20.13	11784.06
Long 22-15-18NBH	1931.33	6614.00	6614.00	1918.08	6614.00	25.11	11770.41
Ottesen #3C-3H-L165	2060.14	11784.06	11784.06	1964.27	11784.06	21.49	11784.06
Ottesen #3B-3H-L165	2298.53	11784.06	11784.06	2199.82	11784.06	23.29	11784.06
Long 22-15-19CH	2339.90	6614.00	6614.00	2326.41	6614.00	173.45	6614.00
Long 22-15-20NBH	2409.58	6614.00	6614.00	2396.12	6614.00	178.97	6614.00
Ottesen #3A-3H-L165	2499.05	11784.06	11784.06	2398.03	11784.06	24.74	11784.06