



NGL WATER SOLUTIONS DJ

Location DJ Basin
Field Wattenberg
Installation NGL C-5A

Slot NGL C-5A
Well NGL C-5A
Wellbore NGL C-5A (PWB)

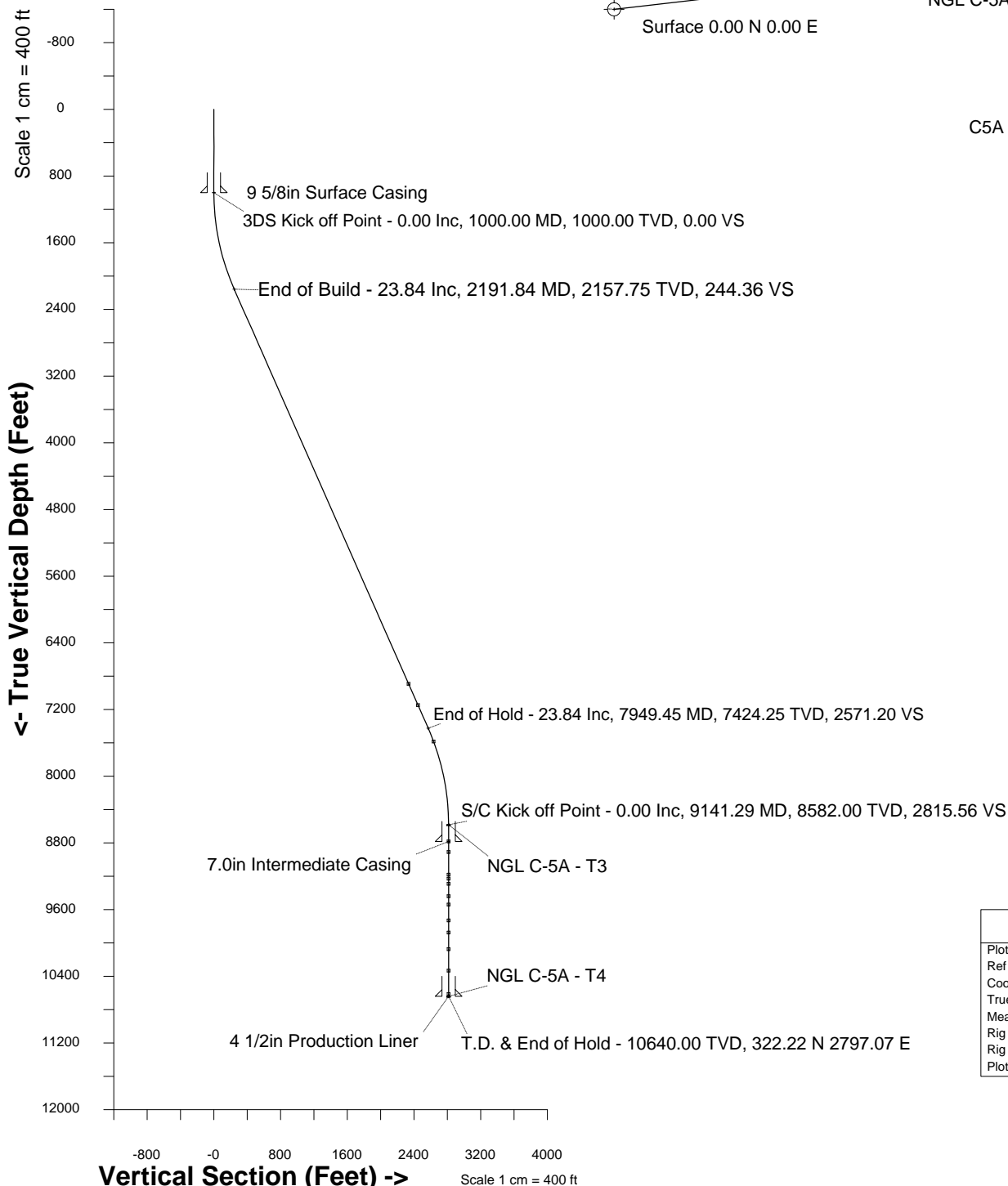


Scale 1 cm = 200 ft

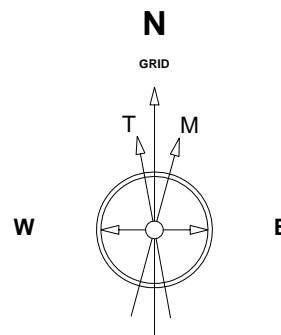
East (Feet) ->

-400 0 400 800 1200 1600 2000 2400 2800 3200

Scale 1 cm = 200 ft
North (Feet)
800
400
0
-400



C5A Boundary



2-Dec-2014
IGRF Model [1900.0-2020.0] Dip: 66.71 deg Field: 52510.8 nT
Lat: N40 6 27.8064 Long: W104 34 32.2968 Elev: 9838.01 ft
Magnetic North is 8.35 deg East of True North
GRID North is 0.60 deg East of True North
To correct azimuth from True to GRID subtract 0.60 deg
To correct azimuth from Magnetic to GRID add 7.76 deg

Created by admin
Date plotted 30-Sep-2015

Plot reference is NGL C-5A (PWB).
Ref wellpath is NGL C-5A (PWP#1).
Coordinates are in Feet reference Installation Centre.
True Vertical Depths are reference Rig Datum.
Measured Depths are reference Rig Datum.
Rig Datum: Planned Datum #1
Rig Datum to Mean Sea Level: 4957.00 ft.
Plot North is aligned to GRID North.

Azimuth 83.43 with reference 0.00 N, 0.00 E from Installation Centre



SYSDRILL
Well Design Combined Report
Wellbore: NGL C-5A (PWB)



Wellhead Details

Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
NGL C-5A	40.10772400	-104.57563800	1283435.6919	3258549.5931	0.00N	0.00E	0.00

Declination

Date	Source	Time
2-Dec-2014	IGRF Model [1900.0-2020.0]	08:20

Installation Details

Name	Installation Position (Latitude)	Installation Position (Longitude)	Northing	Easting	Coord System Name	North Alignment
NGL C-5A	40.10772400	-104.57563800	1283435.6919	3258549.5931	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
20.00	0.00	0.000	20.00	0.00N	0.00E		0.00	1283435.69	3258549.59
1000.00	0.00	83.430	1000.00	0.00N	0.00E	==>	0.00	1283435.69	3258549.59
11199.29	0.00	0.000	10640.00	322.22N	2797.07E	==>	2815.56	1283757.90	3261346.54

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 Slot Datum
20.00	0.00	0.000	20.00	0.00N	0.00E	==>	0.00	
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	9 5/8in Surface Casing
1000.00	0.00	83.430	1000.00	0.00N	0.00E	==>	0.00	
1100.00	2.00	83.430	1099.98	0.20N	1.73E	2.00	1.75	
1200.00	4.00	83.430	1199.84	0.80N	6.93E	2.00	6.98	
1300.00	6.00	83.430	1299.45	1.80N	15.59E	2.00	15.69	
1400.00	8.00	83.430	1398.70	3.19N	27.70E	2.00	27.88	
1500.00	10.00	83.430	1497.47	4.98N	43.24E	2.00	43.52	
1600.00	12.00	83.430	1595.62	7.16N	62.19E	2.00	62.60	
1700.00	14.00	83.430	1693.06	9.74N	84.54E	2.00	85.10	
1800.00	16.00	83.430	1789.64	12.70N	110.25E	2.00	110.98	
1900.00	18.00	83.430	1885.27	16.05N	139.29E	2.00	140.21	
2000.00	20.00	83.430	1979.82	19.77N	171.63E	2.00	172.77	
2100.00	22.00	83.430	2073.17	23.87N	207.23E	2.00	208.60	
2200.00	23.84	83.430	2165.22	28.34N	246.04E	==>	247.66	
2300.00	23.84	83.430	2256.69	32.97N	286.18E	==>	288.08	
2400.00	23.84	83.430	2348.16	37.59N	326.33E	==>	328.49	
2500.00	23.84	83.430	2439.63	42.22N	366.48E	==>	368.90	
2600.00	23.84	83.430	2531.10	46.84N	406.63E	==>	409.32	
2700.00	23.84	83.430	2622.57	51.47N	446.77E	==>	449.73	
2800.00	23.84	83.430	2714.04	56.09N	486.92E	==>	490.14	
2900.00	23.84	83.430	2805.51	60.72N	527.07E	==>	530.56	
3000.00	23.84	83.430	2896.98	65.34N	567.22E	==>	570.97	
3100.00	23.84	83.430	2988.45	69.97N	607.37E	==>	611.38	
3200.00	23.84	83.430	3079.92	74.59N	647.51E	==>	651.80	
3300.00	23.84	83.430	3171.39	79.22N	687.66E	==>	692.21	
3400.00	23.84	83.430	3262.86	83.84N	727.81E	==>	732.62	
3500.00	23.84	83.430	3354.33	88.47N	767.96E	==>	773.03	

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Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 4957.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 83.430 degrees
Bottom hole distance is 2815.56 Feet on azimuth 83.43 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 30-Sep-2015



SYSDRILL
Well Design Combined Report
Wellbore: NGL C-5A (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
3600.00	23.84	83.430	3445.80	93.09N	808.10E	==>	813.45	
3700.00	23.84	83.430	3537.27	97.72N	848.25E	==>	853.86	
3800.00	23.84	83.430	3628.74	102.34N	888.40E	==>	894.27	
3900.00	23.84	83.430	3720.21	106.97N	928.55E	==>	934.69	
4000.00	23.84	83.430	3811.68	111.59N	968.69E	==>	975.10	
4100.00	23.84	83.430	3903.15	116.22N	1008.84E	==>	1015.51	
4200.00	23.84	83.430	3994.62	120.84N	1048.99E	==>	1055.93	
4300.00	23.84	83.430	4086.09	125.47N	1089.14E	==>	1096.34	
4400.00	23.84	83.430	4177.56	130.09N	1129.28E	==>	1136.75	
4500.00	23.84	83.430	4269.03	134.72N	1169.43E	==>	1177.17	
4600.00	23.84	83.430	4360.50	139.34N	1209.58E	==>	1217.58	
4700.00	23.84	83.430	4451.97	143.97N	1249.73E	==>	1257.99	
4800.00	23.84	83.430	4543.44	148.59N	1289.88E	==>	1298.41	
4900.00	23.84	83.430	4634.91	153.22N	1330.02E	==>	1338.82	
5000.00	23.84	83.430	4726.38	157.84N	1370.17E	==>	1379.23	
5100.00	23.84	83.430	4817.85	162.47N	1410.32E	==>	1419.65	
5200.00	23.84	83.430	4909.32	167.09N	1450.47E	==>	1460.06	
5300.00	23.84	83.430	5000.79	171.72N	1490.61E	==>	1500.47	
5400.00	23.84	83.430	5092.26	176.34N	1530.76E	==>	1540.89	
5500.00	23.84	83.430	5183.73	180.97N	1570.91E	==>	1581.30	
5600.00	23.84	83.430	5275.20	185.60N	1611.06E	==>	1621.71	
5700.00	23.84	83.430	5366.67	190.22N	1651.20E	==>	1662.12	
5800.00	23.84	83.430	5458.14	194.85N	1691.35E	==>	1702.54	
5900.00	23.84	83.430	5549.61	199.47N	1731.50E	==>	1742.95	
6000.00	23.84	83.430	5641.08	204.10N	1771.65E	==>	1783.36	
6100.00	23.84	83.430	5732.55	208.72N	1811.79E	==>	1823.78	
6200.00	23.84	83.430	5824.02	213.35N	1851.94E	==>	1864.19	
6300.00	23.84	83.430	5915.49	217.97N	1892.09E	==>	1904.60	
6400.00	23.84	83.430	6006.96	222.60N	1932.24E	==>	1945.02	
6500.00	23.84	83.430	6098.43	227.22N	1972.39E	==>	1985.43	
6600.00	23.84	83.430	6189.90	231.85N	2012.53E	==>	2025.84	
6700.00	23.84	83.430	6281.37	236.47N	2052.68E	==>	2066.26	
6800.00	23.84	83.430	6372.84	241.10N	2092.83E	==>	2106.67	
6900.00	23.84	83.430	6464.31	245.72N	2132.98E	==>	2147.08	
7000.00	23.84	83.430	6555.78	250.35N	2173.12E	==>	2187.50	
7100.00	23.84	83.430	6647.25	254.97N	2213.27E	==>	2227.91	
7200.00	23.84	83.430	6738.72	259.60N	2253.42E	==>	2268.32	
7300.00	23.84	83.430	6830.19	264.22N	2293.57E	==>	2308.74	
7367.57	23.84	83.430	6892.00	267.35N	2320.69E	==>	2336.04	Niobrara
7400.00	23.84	83.430	6921.66	268.85N	2333.71E	==>	2349.15	
7500.00	23.84	83.430	7013.13	273.47N	2373.86E	==>	2389.56	
7600.00	23.84	83.430	7104.60	278.10N	2414.01E	==>	2429.98	
7646.35	23.84	83.430	7147.00	280.24N	2432.62E	==>	2448.71	Codell Ss
7700.00	23.84	83.430	7196.07	282.72N	2454.16E	==>	2470.39	
7800.00	23.84	83.430	7287.54	287.35N	2494.30E	==>	2510.80	
7900.00	23.84	83.430	7379.01	291.97N	2534.45E	==>	2551.21	
8000.00	22.83	83.430	7470.66	296.55N	2574.19E	2.00	2591.22	
8100.00	20.83	83.430	7563.49	300.80N	2611.13E	2.00	2628.40	
8120.84	20.41	83.430	7583.00	301.64N	2618.42E	2.00	2635.74	J Ss
8200.00	18.83	83.430	7657.56	304.69N	2644.82E	2.00	2662.31	
8300.00	16.83	83.430	7752.75	308.19N	2675.23E	2.00	2692.92	
8400.00	14.83	83.430	7848.96	311.31N	2702.32E	2.00	2720.19	
8500.00	12.83	83.430	7946.05	314.04N	2726.06E	2.00	2744.09	
8600.00	10.83	83.430	8043.93	316.39N	2746.42E	2.00	2764.58	
8700.00	8.83	83.430	8142.45	318.34N	2763.37E	2.00	2781.64	
8800.00	6.83	83.430	8241.52	319.90N	2776.89E	2.00	2795.26	
8900.00	4.83	83.430	8341.00	321.06N	2786.98E	2.00	2805.41	
9000.00	2.83	83.430	8440.77	321.83N	2793.60E	2.00	2812.08	
9100.00	0.83	83.430	8540.71	322.19N	2796.77E	2.00	2815.27	
9200.00	0.00	83.430	8640.71	322.22N	2797.07E	==>	2815.56	
9300.00	0.00	83.430	8740.71	322.22N	2797.07E	==>	2815.56	

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SYSDRILL
Well Design Combined Report
Wellbore: NGL C-5A (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
9341.29	0.00	83.430	8782.00	322.22N	2797.07E	==>	2815.56	Lyons, 7.0in Intermediate Casing
9400.00	0.00	83.430	8840.71	322.22N	2797.07E	==>	2815.56	
9469.29	0.00	83.430	8910.00	322.22N	2797.07E	==>	2815.56	L Santanka
9500.00	0.00	83.430	8940.71	322.22N	2797.07E	==>	2815.56	
9600.00	0.00	83.430	9040.71	322.22N	2797.07E	==>	2815.56	Wolfcamp
9700.00	0.00	83.430	9140.71	322.22N	2797.07E	==>	2815.56	
9739.29	0.00	83.430	9180.00	322.22N	2797.07E	==>	2815.56	
9789.29	0.00	83.430	9230.00	322.22N	2797.07E	==>	2815.56	Amazon
9800.00	0.00	83.430	9240.71	322.22N	2797.07E	==>	2815.56	Council Grove
9849.29	0.00	83.430	9290.00	322.22N	2797.07E	==>	2815.56	
9900.00	0.00	83.430	9340.71	322.22N	2797.07E	==>	2815.56	Admire
9999.29	0.00	83.430	9440.00	322.22N	2797.07E	==>	2815.56	
10000.00	0.00	83.430	9440.71	322.22N	2797.07E	==>	2815.56	Virgil
10099.29	0.00	83.430	9540.00	322.22N	2797.07E	==>	2815.56	
10100.00	0.00	83.430	9540.71	322.22N	2797.07E	==>	2815.56	Missouri
10200.00	0.00	83.430	9640.71	322.22N	2797.07E	==>	2815.56	
10289.29	0.00	83.430	9730.00	322.22N	2797.07E	==>	2815.56	
10300.00	0.00	83.430	9740.71	322.22N	2797.07E	==>	2815.56	Fountain
10400.00	0.00	83.430	9840.71	322.22N	2797.07E	==>	2815.56	
10434.29	0.00	83.430	9875.00	322.22N	2797.07E	==>	2815.56	
10500.00	0.00	83.430	9940.71	322.22N	2797.07E	==>	2815.56	
10600.00	0.00	83.430	10040.71	322.22N	2797.07E	==>	2815.56	
10634.29	0.00	83.430	10075.00	322.22N	2797.07E	==>	2815.56	Des Moines
10700.00	0.00	83.430	10140.71	322.22N	2797.07E	==>	2815.56	Atoka
10800.00	0.00	83.430	10240.71	322.22N	2797.07E	==>	2815.56	
10892.29	0.00	83.430	10333.00	322.22N	2797.07E	==>	2815.56	
10900.00	0.00	83.430	10340.71	322.22N	2797.07E	==>	2815.56	
11000.00	0.00	83.430	10440.71	322.22N	2797.07E	==>	2815.56	
11100.00	0.00	83.430	10540.71	322.22N	2797.07E	==>	2815.56	Morrow 4 1/2in Production Liner
11172.29	0.00	83.430	10613.00	322.22N	2797.07E	==>	2815.56	
11199.29	0.00	0.000	10640.00	322.22N	2797.07E	==>	2815.56	

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SYSDRILL
Closest Approach + Clearance Factor Summary Report
Wellbore: NGL C-5A (PWB)



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
NGL C-5A (PWB)	2-Dec-2014	30-Sep-2015

Well		
Name	Government ID	Last Revised
NGL C-5A		2-Dec-2014

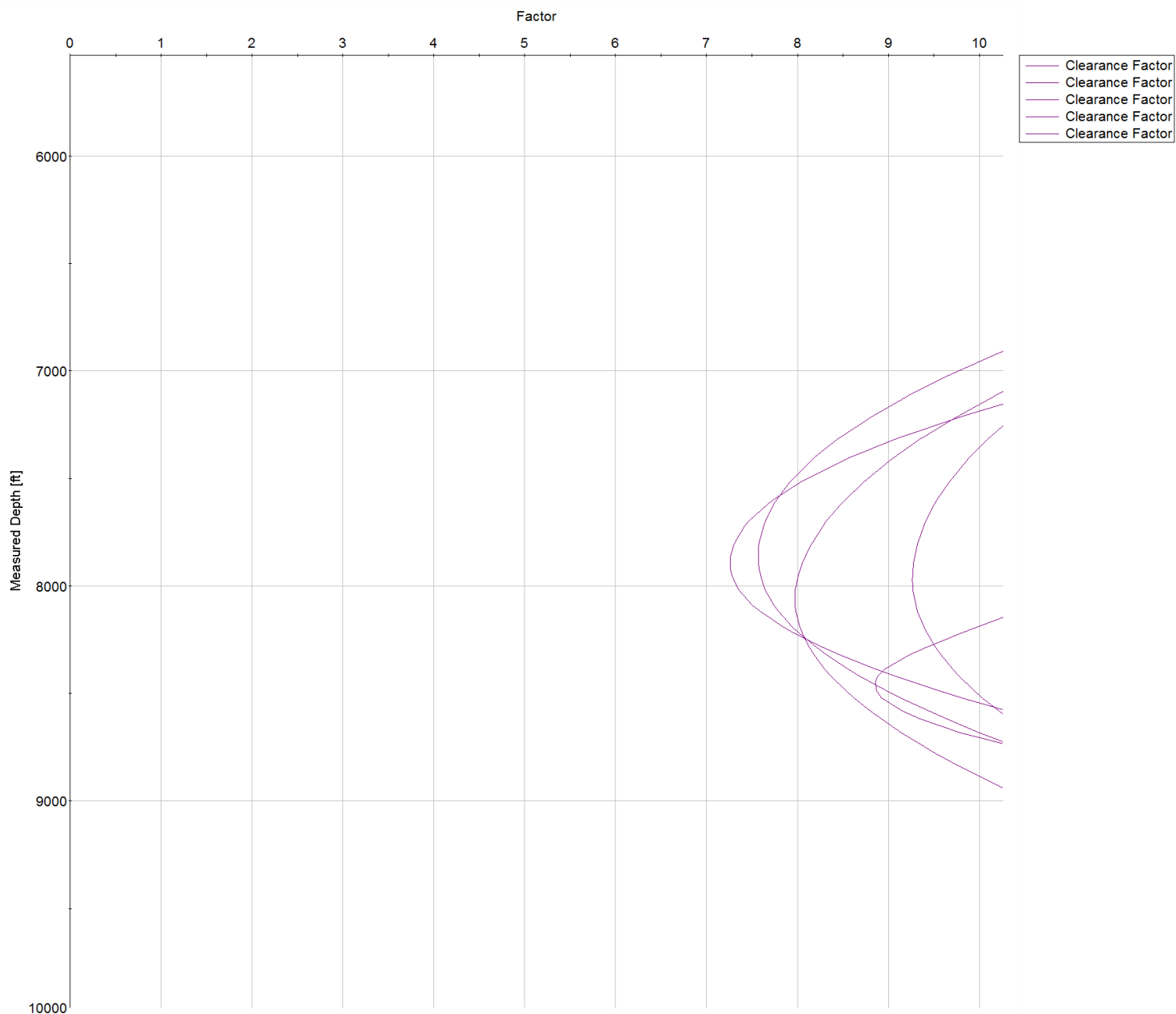
Slot						
Name	Latitude	Longitude	Grid Northing	Grid Easting	North	East
NGL C-5A	40.10772400	-104.57563800	1283435.6919	3258549.5931	0.00N	0.00E

Installation						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Easting	Northing	Coord System Name	North Alignment
NGL C-5A	40.10772400	-104.57563800	3258549.5931	1283435.6919	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]
W GREER #13-28	676.25	8446.07	8446.07	599.91	8451.76	8.86	8451.76
W PARKER #29-34	1075.74	2998.41	2998.41	1041.91	3087.59	24.63	4563.96
W Stonebraker #28W-304	1096.29	7864.64	7864.64	945.39	7864.64	7.26	7894.02
W JIM CREEK #1-29	1293.29	1004.25	1004.25	1280.71	1000.00	65.42	4810.03
W Stonebraker #28V-234	1569.53	7824.88	7824.88	1362.24	7828.40	7.57	7861.21
W GREER #14-28	1711.74	8582.99	8582.99	1608.08	8582.99	16.49	8648.61
W Stonebraker #28V-404	1840.31	8025.25	8025.25	1609.57	8025.25	7.97	8058.06
W Stonebraker #28V-314	2189.56	7914.78	7914.78	1953.39	7926.82	9.26	7976.04
W BAUMGARTNER #14-29	2198.12	1004.25	1004.25	2185.64	1000.00	108.61	2497.03
W KAMINSKY #1-29	2228.46	1004.25	1004.25	2215.64	1000.00	88.00	2825.12
W GREER #23-28	2291.93	8720.24	8720.24	2228.55	8730.63	35.98	8861.86
W BELL #41-29	2387.42	7549.53	7549.53	2292.39	7729.97	23.18	8550.18



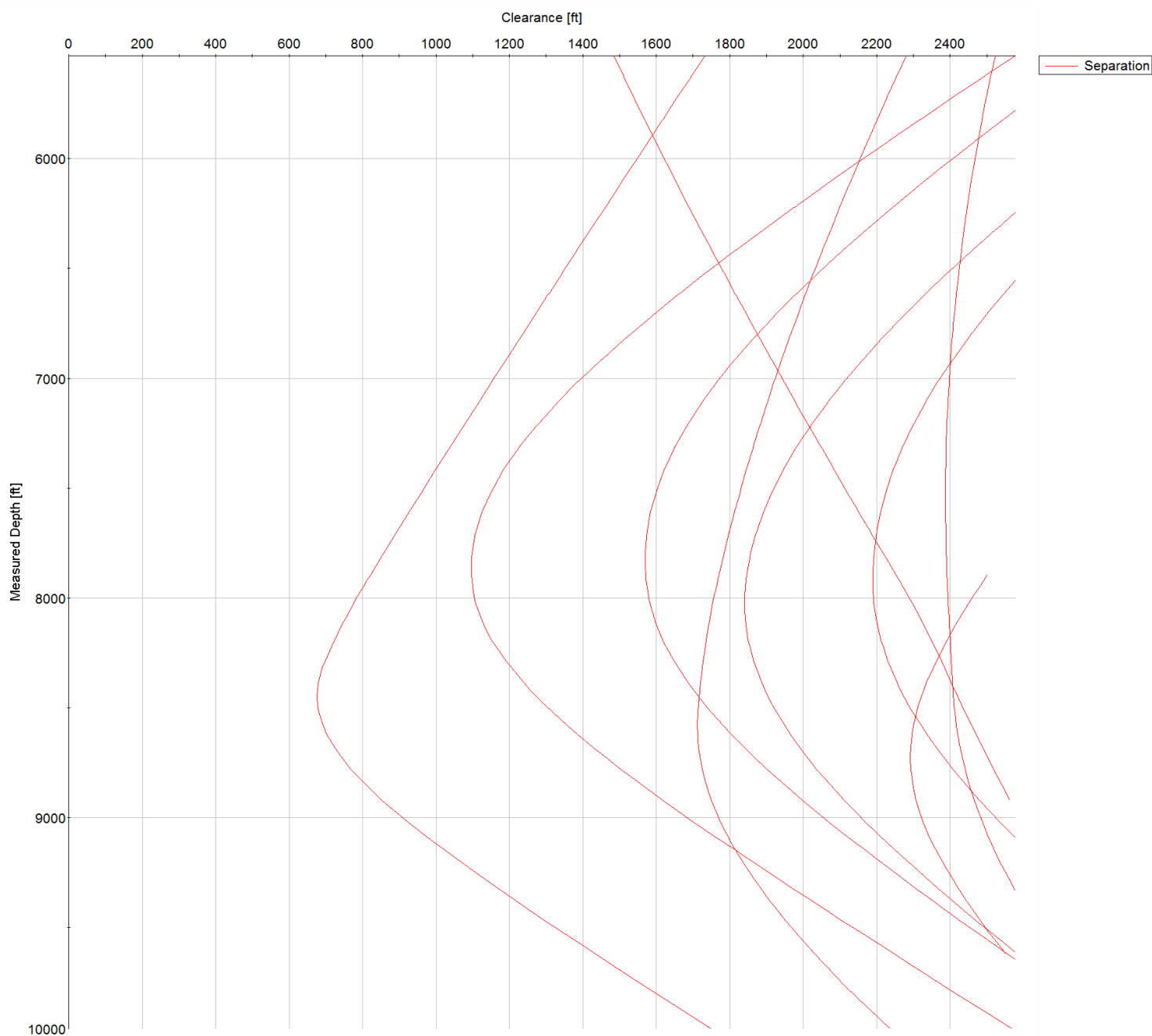
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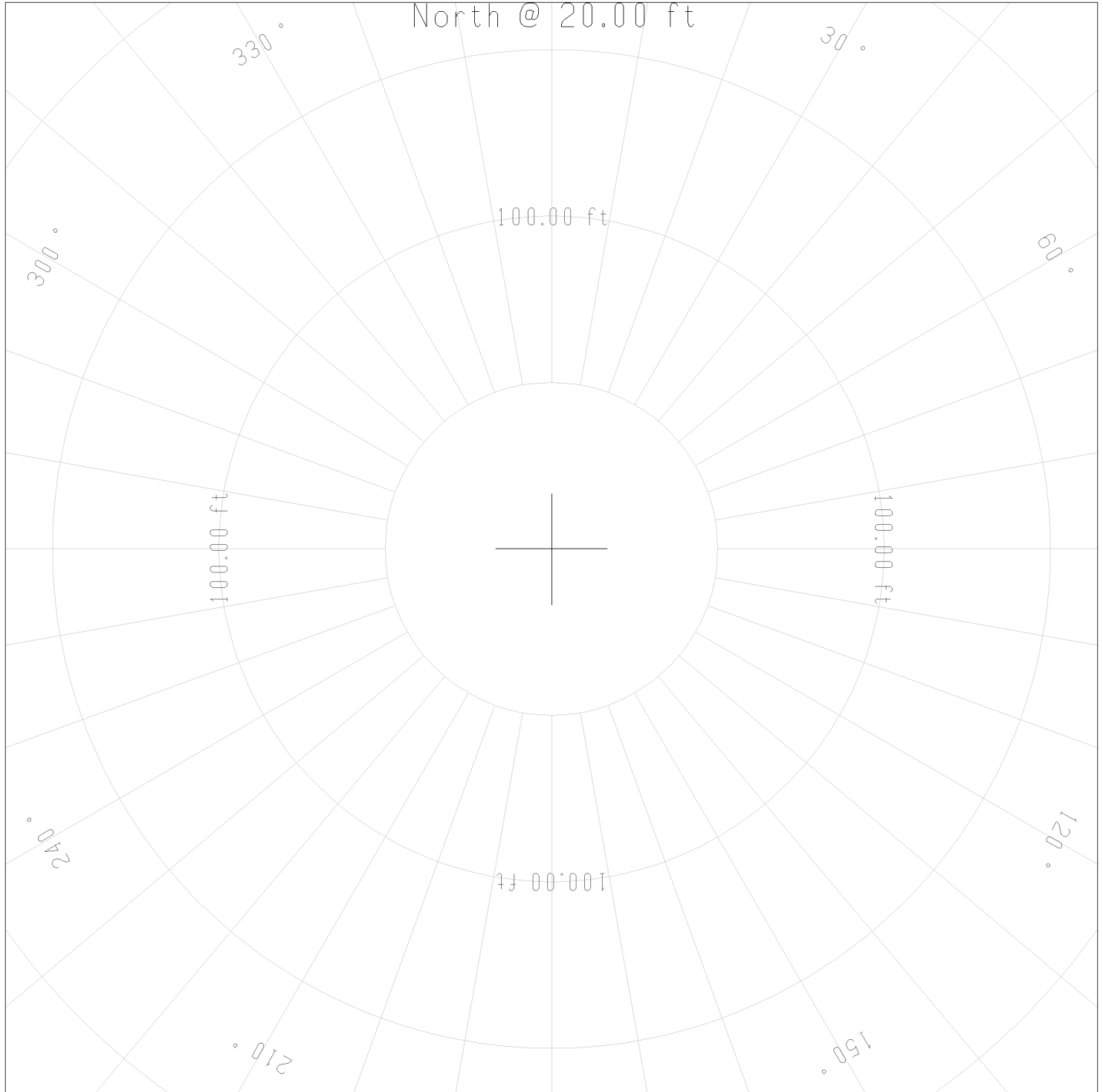
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SYSDRILL
Closest Approach + Clearance Factor Summary Report
Wellbore: NGL C-5A (PWB)



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 4957.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 83.430 degrees
Prepared by Integrated Petroleum Technologies, Inc.
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