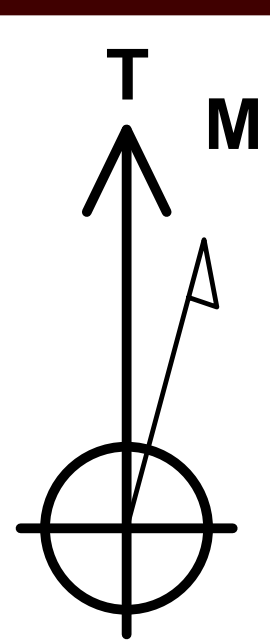




Project: Weld County, CO (NAD83)
Site: RBF
Well: 3
Wellbore: OH / Job #61103
Design: Plan 2 05-26-17
Rig: Patterson 346



Azimuths to True North
Magnetic North: 8.42°

Magnetic Field
Strength: 52461.1nT
Dip Angle: 66.93°
Date: 5/15/2017
Model: HDGM

Map System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone Name: Colorado Northern Zone

Local Origin: Well 3, True North

Latitude: 40° 28' 27.411 N
Longitude: 104° 52' 17.036 W

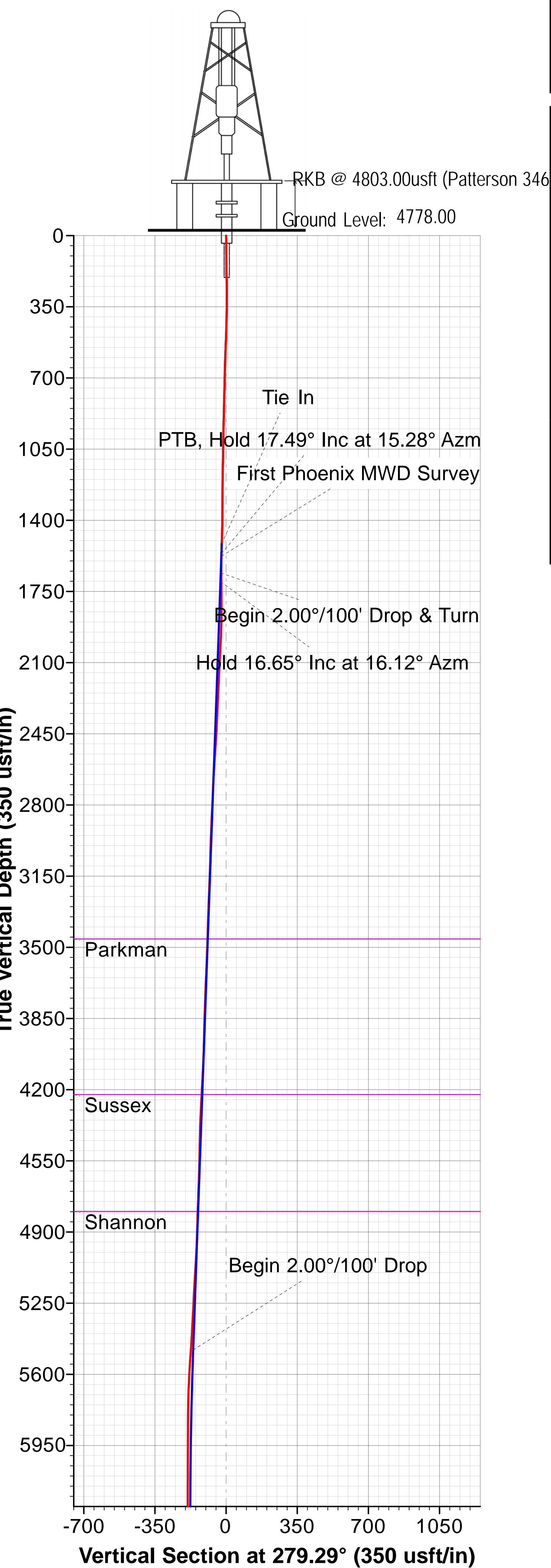
Grid East: 3174878.60
Grid North: 1416240.79
Scale Factor: 1.000

Geomagnetic Model: HDGM
Sample Date: 15-May-17
Magnetic Declination: 8.42°
Dip Angle from Horizontal: 66.93°
Magnetic Field Strength: 52461

To convert a Magnetic Direction to a Grid Direction, Add 8.01°
To convert a Magnetic Direction to a True Direction, Add 8.42° East
To convert a True Direction to a Grid Direction, Subtract 0.41°

LEGEND

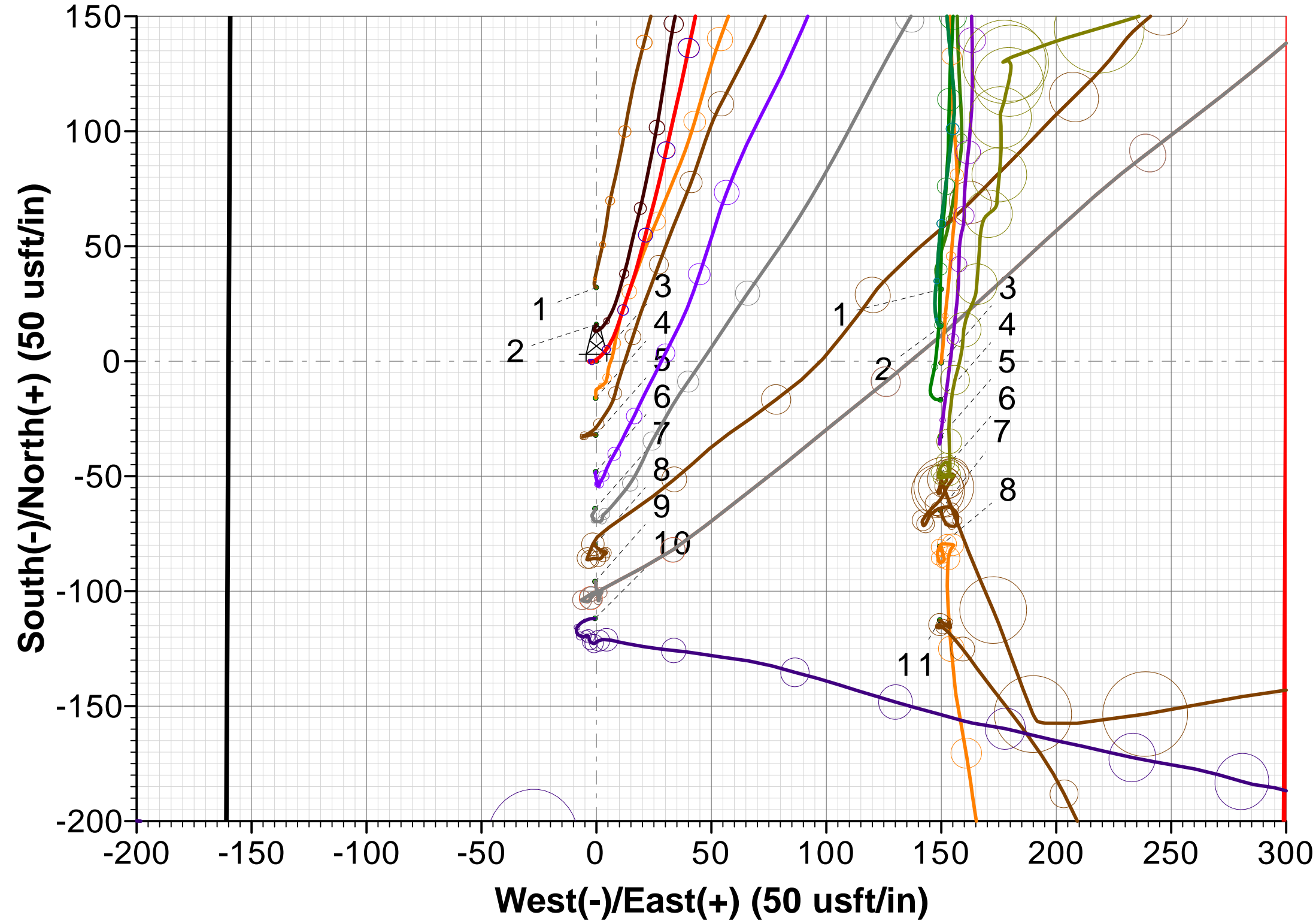
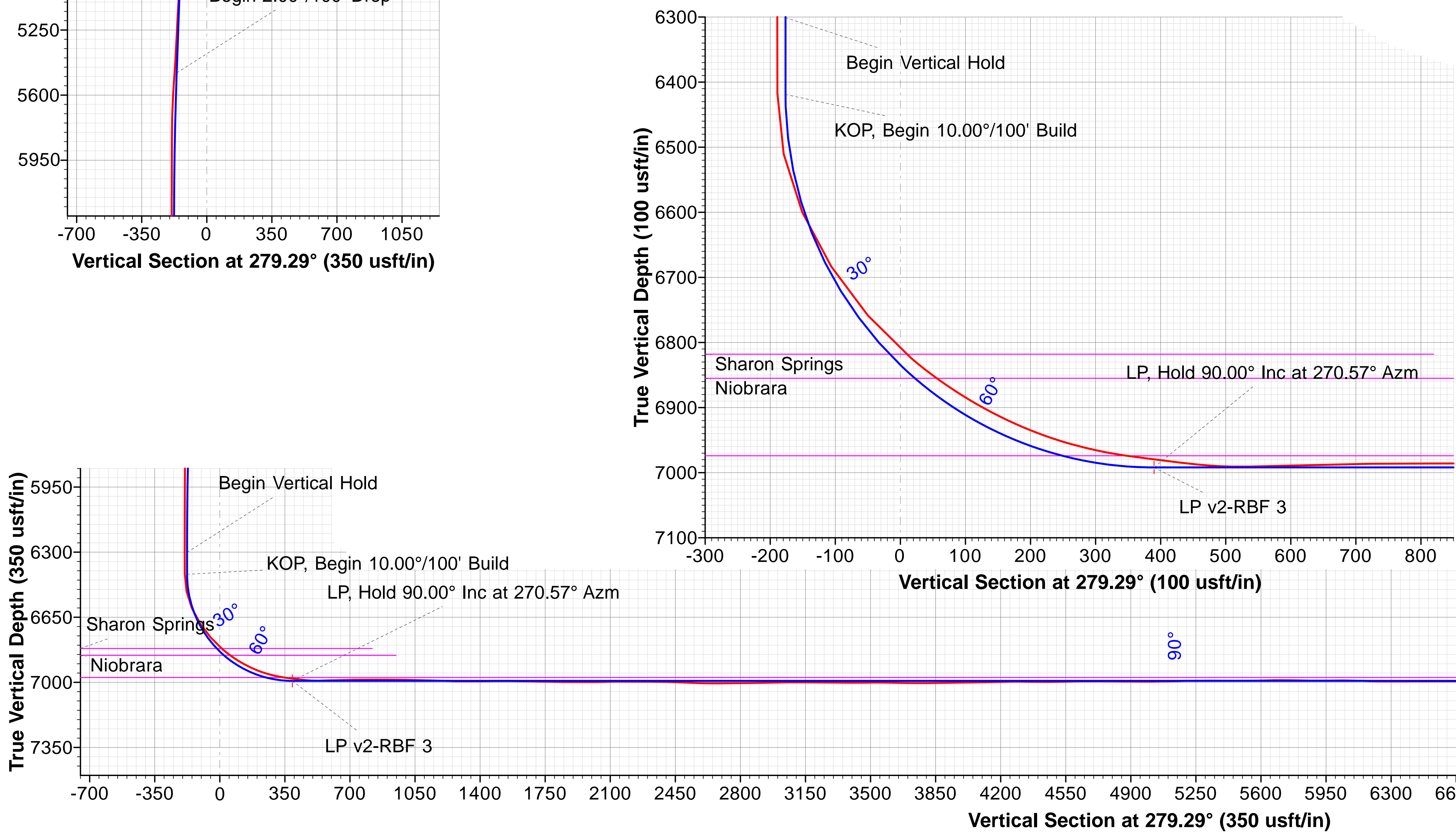
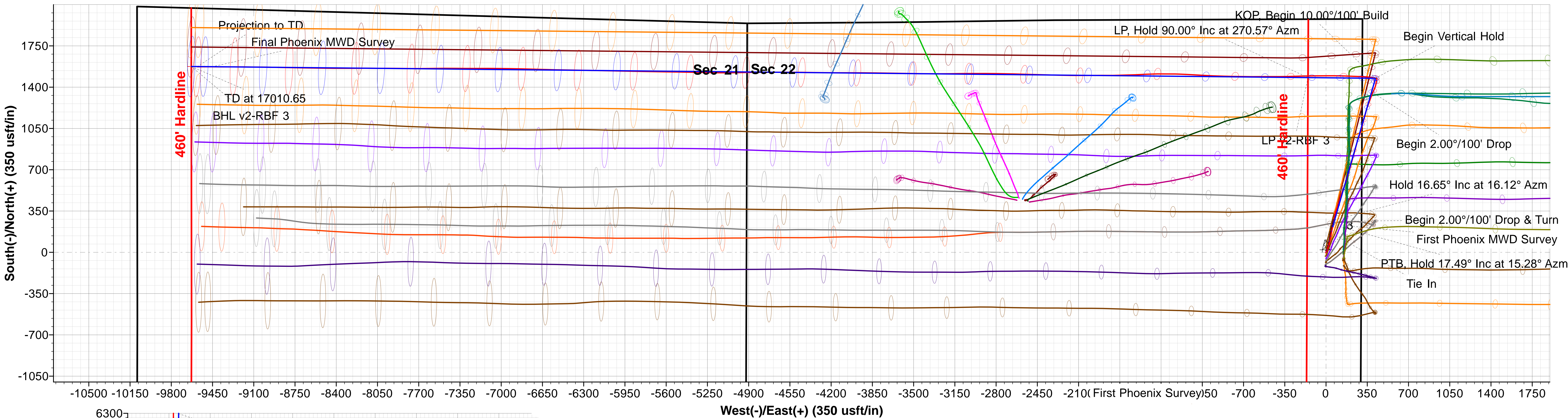
- 9, ST01 / Job #61109, ST01 / Job #61109 V0
- 9, OH / Job #61109, Surveys (Patterson 346) V0
- 2, OH / Job #61102, Plan 1 04-10-19 V0
- 2, OH / Job #61102, Surveys (Patterson 346) V0
- 1, OH / Job #60885, Surveys (Patterson 346) V0
- #22CD, OH, Surveys V0
- 8, OH / Job #60892, Surveys (Patterson 346) V0
- 8, OH / Job #61108, Surveys (Patterson 346) V0
- 3, OH / Job #60887, Surveys (Patterson 346) V0
- 11-22D, OH, Surveys V0
- 11, OH / Job #61092, Surveys (Patterson 346) V0
- 1, OH / Job #61101, Surveys (Patterson 346) V0
- 1, OH / Job #61101, Plan 1 04-10-19 V0
- 7, OH / Job #60891, Surveys (Patterson 346) V0
- #22AD, OH, Surveys V0
- #22ND, OH, Surveys V0
- 4, OH / Job #60888, Surveys (Patterson 346) V0
- 4, OH / Job #61104, Surveys (Patterson 346) V0
- 7, OH / Job #61107, Surveys (Patterson 346) V0
- 10, OH / Job #61110, Surveys (Patterson 346) V0
- 5, OH / Job #60889, Surveys (Patterson 346) V0
- 6, OH / Job #61106, Surveys (Patterson 346) V0
- #21-22D, OH, Surveys V0
- 5, OH / Job #61105, Surveys (Patterson 346) V0
- 2, OH / Job #60886, Surveys (Patterson 346) V0
- 2, ST01 / Job #60886, ST01 / Job #60886 V0
- 2, ST01 / Job #60886, Plan 2 03-07-17 V0
- 3, OH / Job #61103, Surveys (Patterson 346) V0
- 3, OH / Surface, Surveys V0
- 6, OH / Job #60890, Surveys (Patterson 346) V0
- #31-22D, OH, OH V0
- #41-22D, OH, Surveys V0
- #22JD, OH, Surveys V0
- Plan 2 05-26-17



WELL DETAILS											
		Ground Level: 4778.00									
+N/-S		+E/-W		Northing		Easting		Latitude		Longitude	
0.00		0.00		1416240.79		3174878.60		40° 28' 27.411 N		104° 52' 17.036 W	

SECTION DETAILS											
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target	Annotation
1	1544.00	17.49	15.28	1516.27	218.78	57.81	0.00	0.00	-21.73		Tie In
2	1594.00	17.49	15.28	1563.96	233.27	61.77	0.00	0.00	-23.30		PTB, Hold 17.49° Inc at 15.28° Azm
3	1694.00	17.49	15.28	1659.34	262.26	69.69	0.00	0.00	-26.44		Begin 2.00°/100' Drop & Turn
4	1737.88	16.65	16.12	1701.29	274.66	73.17	2.00	164.14	-27.87		Hold 16.65° Inc at 16.12° Azm
5	5682.25	16.65	16.12	5480.33	1360.24	386.87	0.00	0.00	-162.20		Begin 2.00°/100' Drop
6	6514.62	0.00	0.00	6301.04	1475.60	420.20	2.00	180.00	-176.48		Begin Vertical Hold
7	6632.62	0.00	0.00	6419.04	1475.60	420.20	0.00	0.00	-176.48		KOP, Begin 10.00°/100' Build
8	7532.62	90.00	270.57	6992.00	1481.28	-152.73	10.00	270.57	389.86		LP, Hold 90.00° Inc at 270.57° Azm
9	17010.65	90.00	270.57	6992.00	1575.31	-9630.29	0.00	0.00	9758.29	BHL v2-RBF 3	TD at 17010.65

DESIGN TARGET DETAILS											
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape			
BHL v2-RBF 3	6992.00	1575.31	-9630.29	1417747.80	3165237.38	40° 28' 42.960 N	104° 54' 21.661 W	Point			
LP v2-RBF 3	6992.00	1481.27	-152.73	1417720.94	3174715.37	40° 28' 42.049 N	104° 52' 19.013 W	Point			



FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3459.00	3572.49	Parkman	0.00	279.29
4224.00	4370.96	Sussex	0.00	279.29
4799.00	4971.11	Shannon	0.00	279.29
6818.00	7073.95	Sharon Springs	0.00	279.29
6855.00	7128.05	Niobrara	0.00	279.29
6974.00	7388.63	Nio B	0.00	279.29