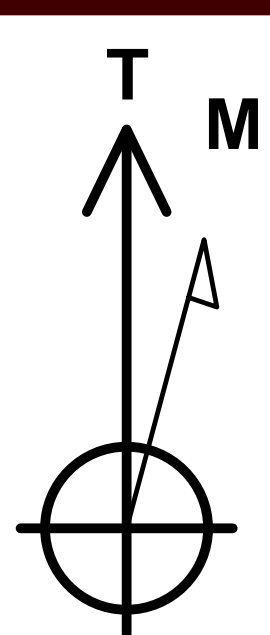




Project: Weld County, CO (NAD83)
Site: RBF
Well: 4
Wellbore: OH / Job #61104
Design: Plan 3 05-23-17
Rig: Patterson 346



Azimuths to True North
Magnetic North: 8.42°

Magnetic Field
Strength: 52461.1snT
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 4, True North

Latitude: 40° 28' 27.253 N
Longitude: 104° 52' 17.040 W

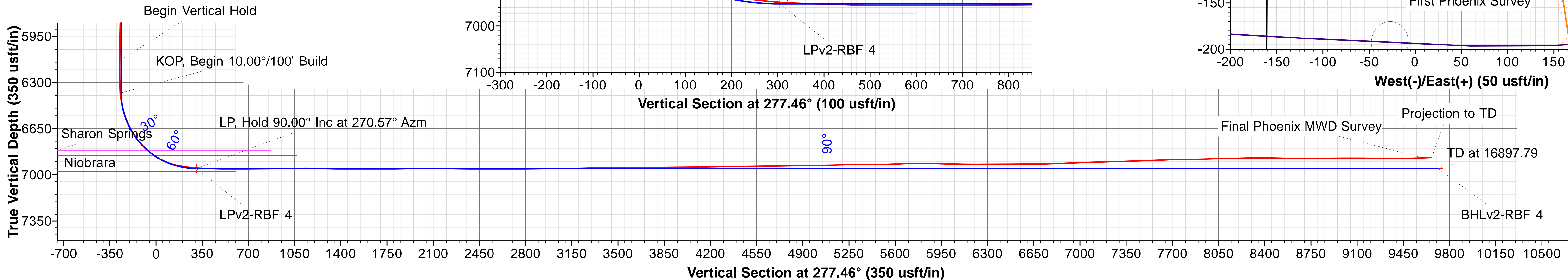
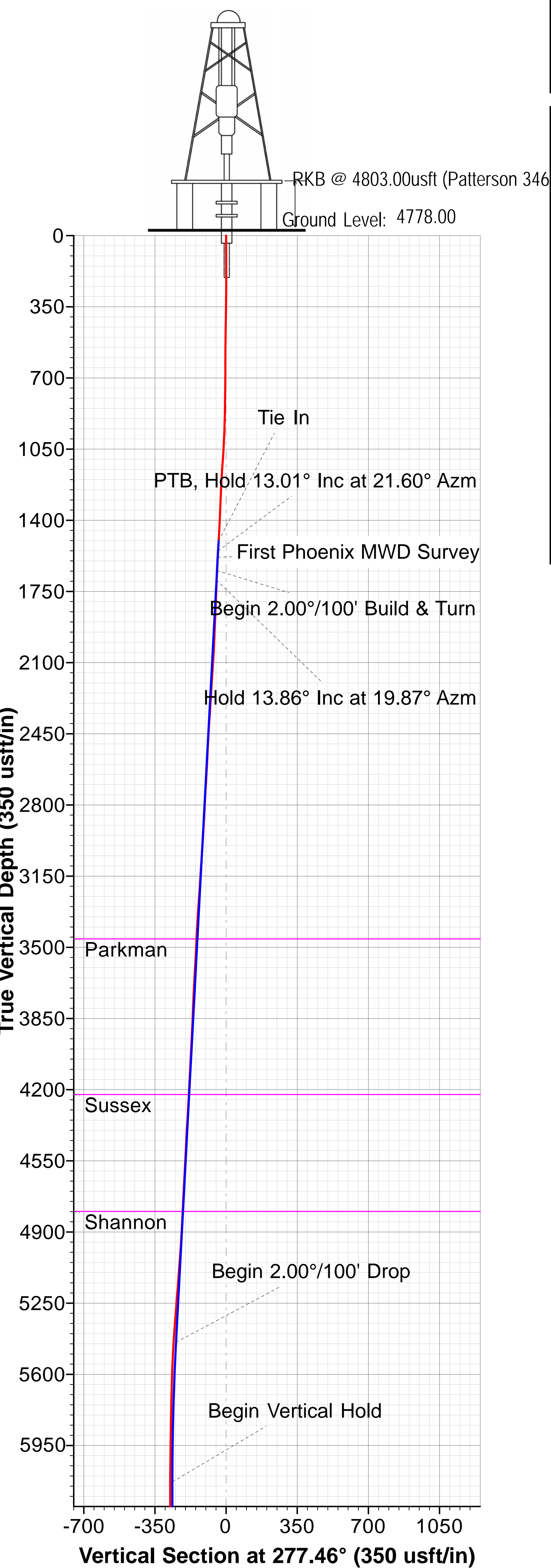
Grid East: 3174878.43
Grid North: 1416224.76
Scale Factor: 1.000

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

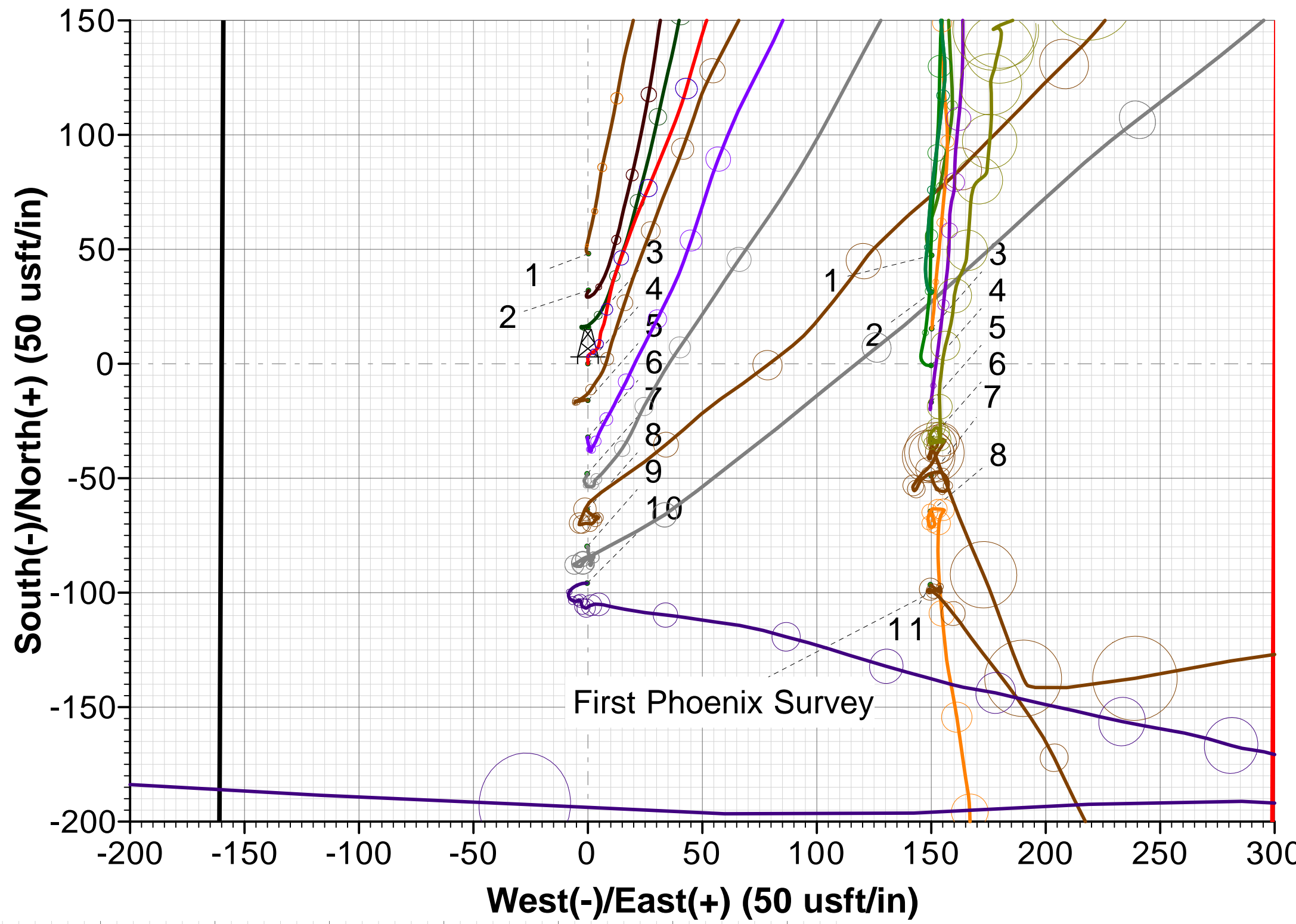
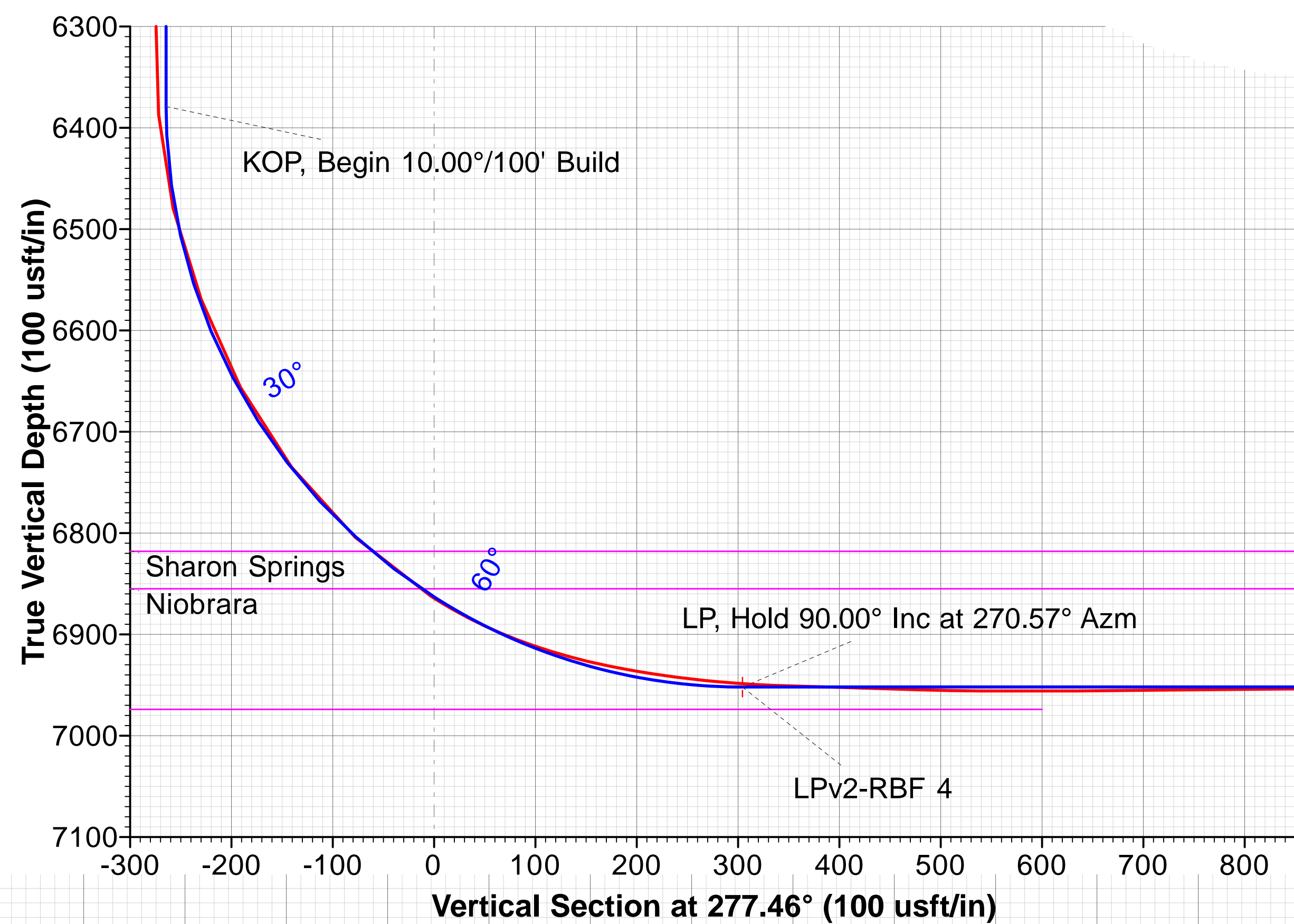
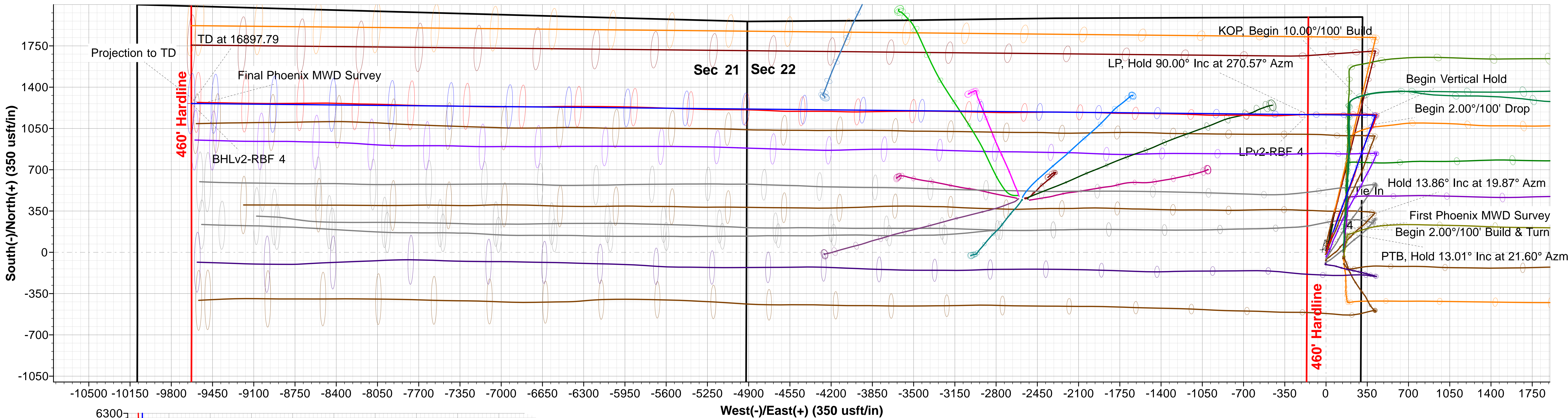
To convert a Magnetic Direction to a Grid Direction, Add 8.01°
To convert a Magnetic Direction to a True Direction, Add 8.42° East
To convert a True Direction to a Grid Direction, Subtract 0.41°

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
- #12-22D, OH, Surveys V0
- 3, OH / Job #60887, Surveys (Patterson 346) V0
- 11-22D, OH, Surveys V0
- 11, OH / Job #61092, Surveys (Patterson 346) V0
- #22-22D, OH, Surveys 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
- 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
- 3, OH / Job #61103, Surveys (Patterson 346) V0
- 6, OH / Job #60890, Surveys (Patterson 346) V0
- #31-22D, OH, OH V0
- #41-22D, OH, Surveys V0
- #22JD, OH, Surveys V0
- 4, OH / Job #61104, Surveys (Patterson 346) V0
- Plan 3 05-23-17



WELL DETAILS											
		+N/-S	+E/-W	Northing	Ground Level:		4778.00				
		0.00	0.00	1416224.76	Easting		3174878.43		Latitude		Longitude
									40° 28' 27.253 N		104° 52' 17.040 W
SECTION DETAILS											
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target	Annotation
1	1520.00	13.97	21.60	1501.66	170.83	59.51	0.00	0.00	-36.82		Tie In
2	1570.00	13.01	21.60	1550.28	181.67	63.80	1.92	180.00	-39.67		PTB, Hold 13.01° Inc at 21.60° Azm
3	1670.00	13.01	21.60	1647.72	202.61	72.09	0.00	0.00	-45.17		Begin 2.00°/100' Build & Turn
4	1717.23	13.86	19.87	1693.66	212.87	75.97	2.00	-26.07	-47.69		Hold 13.86° Inc at 19.87° Azm
5	5578.63	13.86	19.87	5442.55	1083.10	390.43	0.00	0.00	-246.48		Begin 2.00°/100' Drop
6	6271.86	0.00	0.00	6129.04	1161.60	418.80	2.00	180.00	-264.41		Begin Vertical Hold
7	6521.86	0.00	0.00	6379.04	1161.60	418.80	0.00	0.00	-264.41		KOP, Begin 10.00°/100' Build
8	7421.86	90.00	270.57	6952.00	1167.28	-154.13	10.00	270.57	304.41		LP, Hold 90.00° Inc at 270.57° Azm
9	16897.79	90.00	270.57	6952.00	1261.29	-9629.59	0.00	0.00	9711.84	BHLv2-RBF 4	TD at 16897.79
DESIGN TARGET DETAILS											
Name		TVD	+N/-S	+E/-W	Northing	Easting		Latitude		Longitude	Shape
BHLv2-RBF 4		6952.00	1261.29	-9629.59	1417417.75	3165240.15		40° 28' 39.698 N		104° 54' 21.654 W	Point
LPv2-RBF 4		6952.00	1167.24	-154.12	1417390.88	3174716.04		40° 28' 38.788 N		104° 52' 19.034 W	Point



FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3459.00	3535.55	Parkman	0.00	277.46
4224.00	4323.51	Sussex	0.00	277.46
4799.00	4915.77	Shannon	0.00	277.46
6818.00	7021.94	Sharon Springs	0.00	277.46
6855.00	7083.58	Niobrara	0.00	277.46