

Vanguard Natural Resources

Garfield County, Co

MPD 25

Fed. 34A-33-691

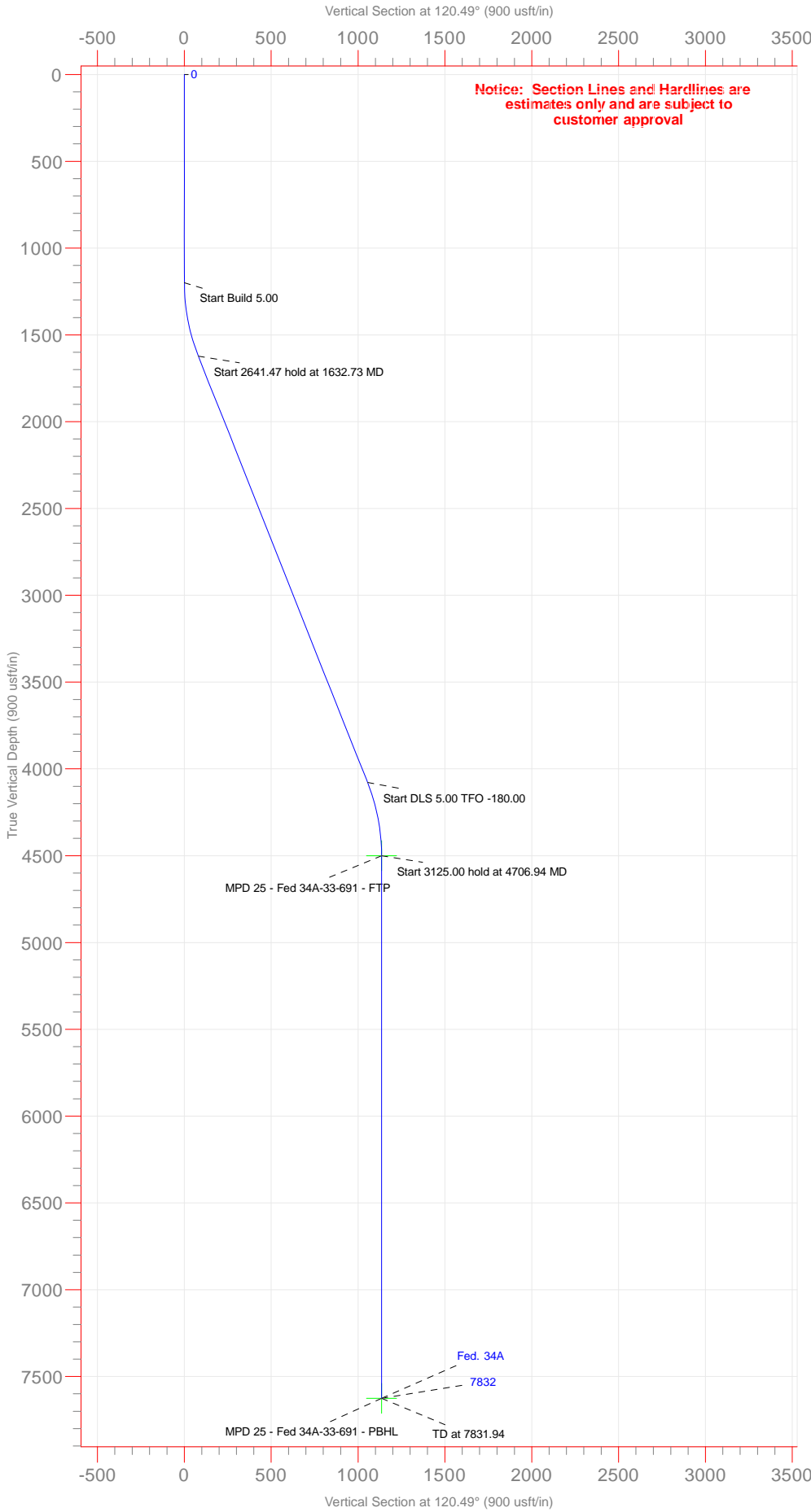
Fed. 34A

Plan: Design #2

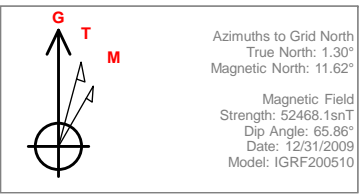
Standard Planning Report

10 February, 2017

Plan: Design #2 (Fed. 34A-33-691/Fed. 34A)
WELL @ 6540.40usft (Original Well Elev)



PROJECT DETAILS: Garfield County, Co	
Geodetic System:	US State Plane 1983
Datum:	North American Datum 1983
Ellipsoid:	GRS 1980
Zone:	Colorado Central Zone
North Reference:	Grid
System Datum:	Mean Sea Level
To convert a Magnetic Direction to a Grid Direction, Add 11.62°	
To convert a Magnetic Direction to a True Direction, Add 10.32° East	
To convert a True Direction to a Grid Direction, Add 1.30°	

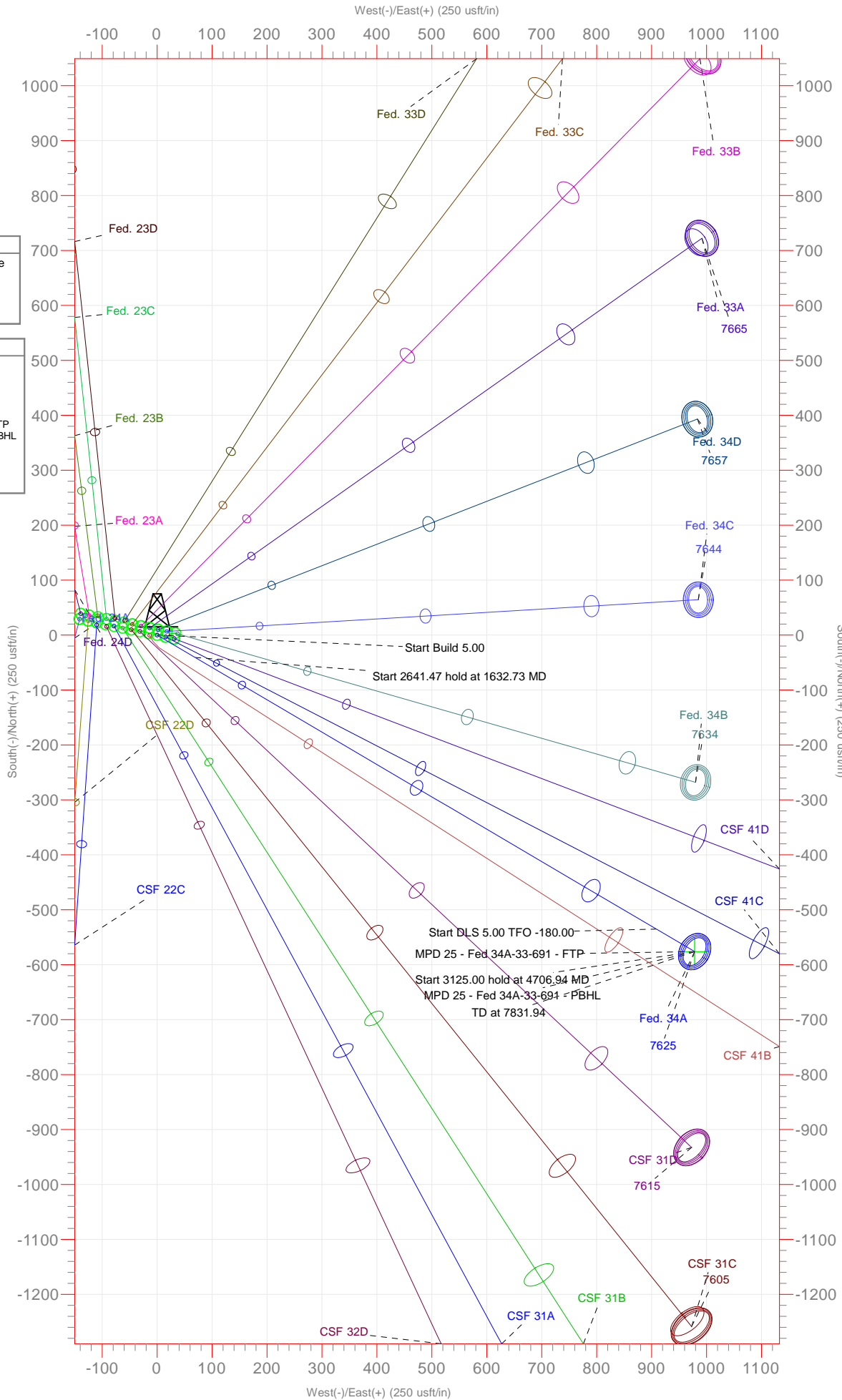
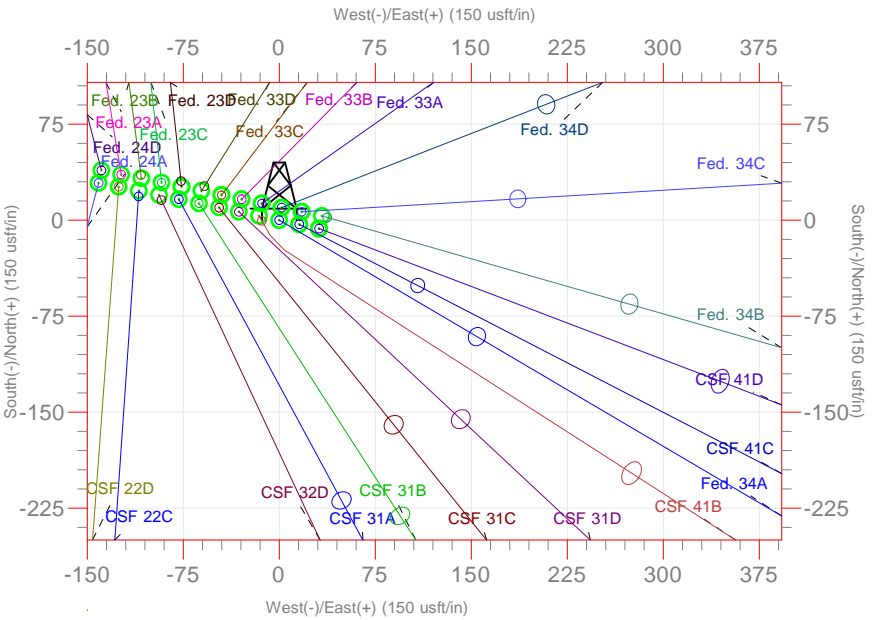


WELLBORE TARGET DETAILS						
Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape Point
Vanguard MPD 25 - Federal 34A-33-691 - FTP	500.40	-576.12	978.43	1605463.40	2419545.40	Point
Vanguard MPD 25 - Federal 34A-33-691 - PBHL	7831.94	-576.12	978.43	1605463.40	2419545.40	Point

SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1200.00	0.00	0.00	1200.00	0.00	0.00	0.00	0.00	0.00	
3	1632.73	21.64	120.49	1632.52	-40.97	69.58	5.00	120.49	80.74	
4	4274.21	21.64	120.49	4077.88	-535.15	908.86	0.00	0.00	1054.71	
5	4706.94	0.00	0.00	4500.40	-576.12	978.43	5.00	-180.00	1135.45	MPD 25 - Fed 34A-33-691 - FTP
6	7831.94	0.00	0.00	7625.40	-576.12	978.43	0.00	0.00	1135.45	MPD 25 - Fed 34A-33-691 - PBHL

FORMATION TOPS ALONG WELLPATH	
No formation data is available	

CASING DETAILS	
No casing data is available	
Notice: Casing Depths Are Estimates Only	



Gyrodata Inc.

Planning Report

Database:	Gyrodata NWDB	Local Co-ordinate Reference:	Well Fed. 34A-33-691
Company:	Vanguard Natural Resources	TVD Reference:	WELL @ 6540.40usft (Original Well Elev)
Project:	Garfield County, Co	MD Reference:	WELL @ 6540.40usft (Original Well Elev)
Site:	MPD 25	North Reference:	Grid
Well:	Fed. 34A-33-691	Survey Calculation Method:	Minimum Curvature
Wellbore:	Fed. 34A		
Design:	Design #2		

Project	Garfield County, Co		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site	MPD 25				
Site Position:		Northing:	1,606,081.66 usft	Latitude:	39° 28' 45.692 N
From:	Lat/Long	Easting:	2,418,412.36 usft	Longitude:	107° 33' 38.131 W
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.30 °

Well	Fed. 34A-33-691					
Well Position	+N-S	-42.14 usft	Northing:	1,606,039.51 usft	Latitude:	39° 28' 45.311 N
	+E-W	154.61 usft	Easting:	2,418,566.97 usft	Longitude:	107° 33' 36.148 W
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	6,540.40 usft

Wellbore	Fed. 34A				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	12/31/09	10.32	65.86	52,468.10706116

Design	Design #2			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	120.49

Plan Survey Tool Program	Date	02/10/17		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	7,831.94	Design #2 (Fed. 34A)	MWD - OSWG
				OWSG MWD - Standard

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,632.73	21.64	120.49	1,622.52	-40.97	69.58	5.00	5.00	0.00	120.49	
4,274.21	21.64	120.49	4,077.88	-535.15	908.86	0.00	0.00	0.00	0.00	
4,706.94	0.00	0.00	4,500.40	-576.12	978.43	5.00	-5.00	-27.84	-180.00	Vanguard MPD 25
7,831.94	0.00	0.00	7,625.40	-576.12	978.43	0.00	0.00	0.00	0.00	Vanguard MPD 25

Gyrodatab Inc.

Planning Report

Database:	Gyrodatab NWDB	Local Co-ordinate Reference:	Well Fed. 34A-33-691
Company:	Vanguard Natural Resources	TVD Reference:	WELL @ 6540.40usft (Original Well Elev)
Project:	Garfield County, Co	MD Reference:	WELL @ 6540.40usft (Original Well Elev)
Site:	MPD 25	North Reference:	Grid
Well:	Fed. 34A-33-691	Survey Calculation Method:	Minimum Curvature
Wellbore:	Fed. 34A		
Design:	Design #2		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	5.00	120.49	1,299.87	-2.21	3.76	4.36	5.00	5.00	0.00
1,400.00	10.00	120.49	1,398.99	-8.83	15.00	17.41	5.00	5.00	0.00
1,500.00	15.00	120.49	1,496.58	-19.81	33.65	39.05	5.00	5.00	0.00
1,600.00	20.00	120.49	1,591.93	-35.06	59.55	69.11	5.00	5.00	0.00
1,632.73	21.64	120.49	1,622.52	-40.97	69.58	80.74	5.00	5.00	0.00
1,700.00	21.64	120.49	1,685.05	-53.55	90.95	105.54	0.00	0.00	0.00
1,800.00	21.64	120.49	1,778.00	-72.26	122.72	142.42	0.00	0.00	0.00
1,900.00	21.64	120.49	1,870.96	-90.97	154.49	179.29	0.00	0.00	0.00
2,000.00	21.64	120.49	1,963.91	-109.68	186.27	216.16	0.00	0.00	0.00
2,100.00	21.64	120.49	2,056.86	-128.39	218.04	253.03	0.00	0.00	0.00
2,200.00	21.64	120.49	2,149.82	-147.10	249.81	289.90	0.00	0.00	0.00
2,300.00	21.64	120.49	2,242.77	-165.80	281.59	326.78	0.00	0.00	0.00
2,400.00	21.64	120.49	2,335.73	-184.51	313.36	363.65	0.00	0.00	0.00
2,500.00	21.64	120.49	2,428.68	-203.22	345.13	400.52	0.00	0.00	0.00
2,600.00	21.64	120.49	2,521.63	-221.93	376.91	437.39	0.00	0.00	0.00
2,700.00	21.64	120.49	2,614.59	-240.64	408.68	474.26	0.00	0.00	0.00
2,800.00	21.64	120.49	2,707.54	-259.35	440.45	511.14	0.00	0.00	0.00
2,900.00	21.64	120.49	2,800.50	-278.06	472.23	548.01	0.00	0.00	0.00
3,000.00	21.64	120.49	2,893.45	-296.76	504.00	584.88	0.00	0.00	0.00
3,100.00	21.64	120.49	2,986.40	-315.47	535.77	621.75	0.00	0.00	0.00
3,200.00	21.64	120.49	3,079.36	-334.18	567.55	658.62	0.00	0.00	0.00
3,300.00	21.64	120.49	3,172.31	-352.89	599.32	695.50	0.00	0.00	0.00
3,400.00	21.64	120.49	3,265.27	-371.60	631.09	732.37	0.00	0.00	0.00
3,500.00	21.64	120.49	3,358.22	-390.31	662.86	769.24	0.00	0.00	0.00
3,600.00	21.64	120.49	3,451.18	-409.02	694.64	806.11	0.00	0.00	0.00
3,700.00	21.64	120.49	3,544.13	-427.73	726.41	842.98	0.00	0.00	0.00
3,800.00	21.64	120.49	3,637.08	-446.43	758.18	879.86	0.00	0.00	0.00
3,900.00	21.64	120.49	3,730.04	-465.14	789.96	916.73	0.00	0.00	0.00
4,000.00	21.64	120.49	3,822.99	-483.85	821.73	953.60	0.00	0.00	0.00
4,100.00	21.64	120.49	3,915.95	-502.56	853.50	990.47	0.00	0.00	0.00
4,200.00	21.64	120.49	4,008.90	-521.27	885.28	1,027.34	0.00	0.00	0.00
4,274.21	21.64	120.49	4,077.88	-535.15	908.86	1,054.71	0.00	0.00	0.00
4,300.00	20.35	120.49	4,101.96	-539.84	916.82	1,063.95	5.00	-5.00	0.00
4,400.00	15.35	120.49	4,197.12	-555.39	943.22	1,094.58	5.00	-5.00	0.00
4,500.00	10.35	120.49	4,294.58	-566.66	962.37	1,116.81	5.00	-5.00	0.00
4,600.00	5.35	120.49	4,393.61	-573.59	974.13	1,130.46	5.00	-5.00	0.00
4,700.00	0.35	120.49	4,493.46	-576.11	978.41	1,135.43	5.00	-5.00	0.00
4,706.94	0.00	0.00	4,500.40	-576.12	978.43	1,135.45	5.00	-5.00	-1,735.75
Vanguard MPD 25 - Federal 34A-33-691 - FTP									
4,800.00	0.00	0.00	4,593.46	-576.12	978.43	1,135.45	0.00	0.00	0.00
4,900.00	0.00	0.00	4,693.46	-576.12	978.43	1,135.45	0.00	0.00	0.00

Gyrodata Inc.

Planning Report

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Site:	MPD 25	North Reference:	Grid
Well:	Fed. 34A-33-691	Survey Calculation Method:	Minimum Curvature
Wellbore:	Fed. 34A		
Design:	Design #2		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
5,000.00	0.00	0.00	4,793.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
5,100.00	0.00	0.00	4,893.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
5,200.00	0.00	0.00	4,993.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
5,300.00	0.00	0.00	5,093.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
5,400.00	0.00	0.00	5,193.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
5,500.00	0.00	0.00	5,293.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
5,600.00	0.00	0.00	5,393.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
5,700.00	0.00	0.00	5,493.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
5,800.00	0.00	0.00	5,593.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
5,900.00	0.00	0.00	5,693.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
6,000.00	0.00	0.00	5,793.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
6,100.00	0.00	0.00	5,893.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
6,200.00	0.00	0.00	5,993.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
6,300.00	0.00	0.00	6,093.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
6,400.00	0.00	0.00	6,193.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
6,500.00	0.00	0.00	6,293.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
6,600.00	0.00	0.00	6,393.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
6,700.00	0.00	0.00	6,493.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
6,800.00	0.00	0.00	6,593.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
6,900.00	0.00	0.00	6,693.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
7,000.00	0.00	0.00	6,793.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
7,100.00	0.00	0.00	6,893.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
7,200.00	0.00	0.00	6,993.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
7,300.00	0.00	0.00	7,093.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
7,400.00	0.00	0.00	7,193.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
7,500.00	0.00	0.00	7,293.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
7,600.00	0.00	0.00	7,393.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
7,700.00	0.00	0.00	7,493.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
7,800.00	0.00	0.00	7,593.46	-576.12	978.43	1,135.45	0.00	0.00	0.00	
7,831.94	0.00	0.00	7,625.40	-576.12	978.43	1,135.45	0.00	0.00	0.00	
Vanguard MPD 25 - Federal 34A-33-691 - PBHL										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
- hit/miss target										
- Shape										
Vanguard MPD 25 - F	0.00	360.00	4,500.40	-576.12	978.43	1,605,463.40	2,419,545.40	39° 28' 39.837 N	107° 33' 23.506 W	
- plan hits target center										
- Point										
Vanguard MPD 25 - F	0.00	0.00	7,625.40	-576.12	978.43	1,605,463.40	2,419,545.40	39° 28' 39.837 N	107° 33' 23.506 W	
- plan hits target center										
- Point										