

Elm Ridge Exploration Company.

La Plata County, Co (Nad 83)

Sec 15, T33N, R9W

IGW 152

DD

UWI:

WL:

Plan: #2

Standard Planning Report

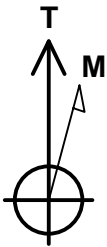
04 February, 2014



Elm Ridge Exploration Company.

Project: La Plata County, Co (Nad 83)
Site: Sec 15, T33N, R9W
Well: IGW 152
Wellbore: DD
Plan: #2

Reference Details - WELL CENTRE
Geodetic System: US State Plane 1983
Ellipsoid: GRS 1980
Zone: Colorado Southern Zone
Northing: 1166481.94
Easting: 2323796.32
Latitude: 37° 6' 2.988 N
Longitude: 107° 49' 7.500 W
Grid Convergence: 1.42° East
Ground Elevation: 6857.0
KB Elevation: ESt RKB @ 6871.0usft (IGW 152)

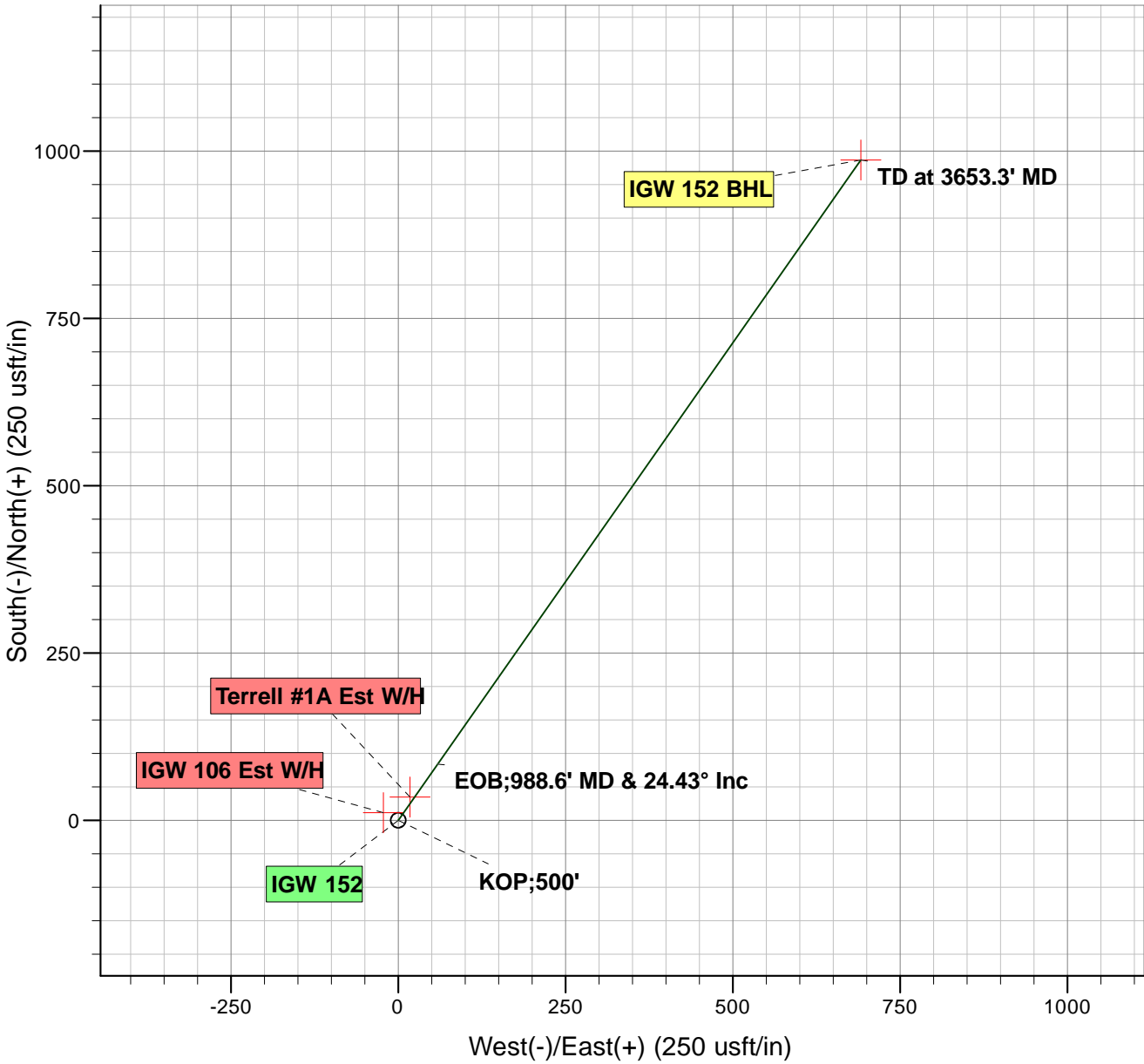
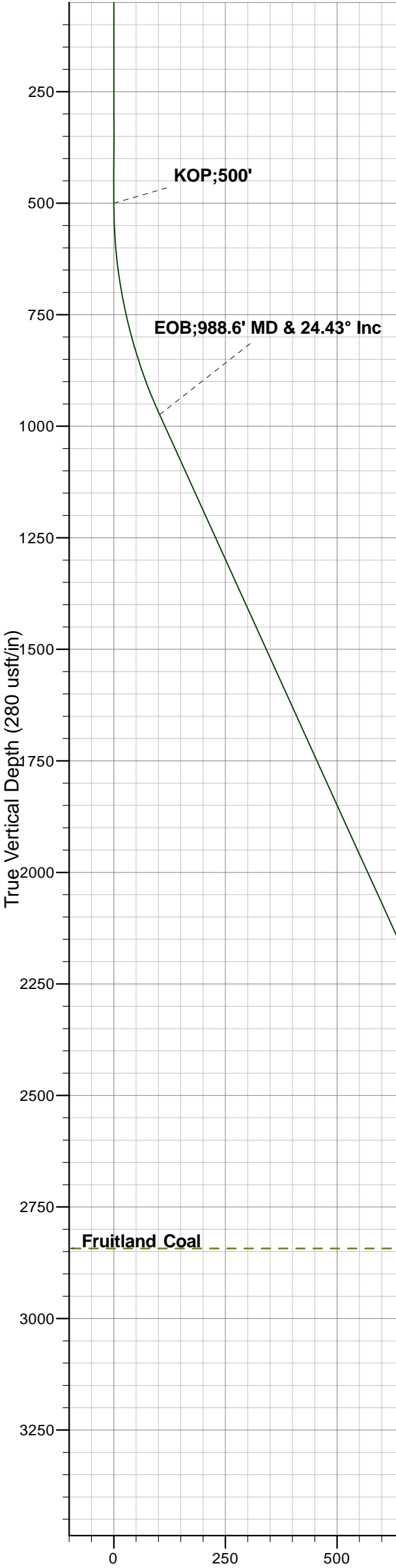


Azimuths to True North
Magnetic North: 9.64°

Magnetic Field
Strength: 50667.8snT
Dip Angle: 63.70°
Date: 2/5/2014
Model: IGRF2010

PLAN DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.0	
3	988.6	24.43	35.01	974.0	84.0	58.9	5.00	35.01	102.6	
4	3653.3	24.43	35.01	3400.0	986.8	691.2	0.00	0.00	1204.3	IGW 152 BHL



ANNOTATIONS

TVD	MD	Annotation
500.0	500.0	KOP;500'
974.0	988.6	EOB;988.6' MD & 24.43° Inc
3400.0	3653.3	TD at 3653.3' MD

FORMATION TOP DETAILS

TVDPPath	MDPath	Formation
2843.0	3041.5	Fruitland Coal



Mesa West Directional

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well IGW 152
Company:	Elm Ridge Exploration Company.	TVD Reference:	Est RKB @ 6871.0usft (IGW 152)
Project:	La Plata County, Co (Nad 83)	MD Reference:	Est RKB @ 6871.0usft (IGW 152)
Site:	Sec 15, T33N, R9W	North Reference:	True
Well:	IGW 152	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	#2		

Project	La Plata County, Co (Nad 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Southern Zone		

Site	Sec 15, T33N, R9W			
Site Position:		Northing:	1,166,481.94 usft	Latitude: 37° 6' 2.988 N
From:	Lat/Long	Easting:	2,323,796.32 usft	Longitude: 107° 49' 7.500 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence: -1.42 °

Well	IGW 152			
Well Position	+N/-S	0.0 usft	Northing:	1,166,481.94 usft
	+E/-W	0.0 usft	Easting:	2,323,796.32 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:		Ground Level: 6,857.0 usft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/5/2014	9.64	63.70	50,668

Design	#2			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	33.49

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.00	0.00	
988.6	24.43	35.01	974.0	84.0	58.9	5.00	5.00	7.16	35.01	
3,653.3	24.43	35.01	3,400.0	986.8	691.2	0.00	0.00	0.00	0.00	IGW 152 BHL

Mesa West Directional

Planning Report



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Company:	Elm Ridge Exploration Company.	TVD Reference:	Est RKB @ 6871.0usft (IGW 152)
Project:	La Plata County, Co (Nad 83)	MD Reference:	Est RKB @ 6871.0usft (IGW 152)
Site:	Sec 15, T33N, R9W	North Reference:	True
Well:	IGW 152	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	#2		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	-6,871.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP;500'										
500.0	0.00	0.00	500.0	-6,371.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	5.00	35.01	599.9	-6,271.1	3.6	2.5	4.4	5.00	5.00	0.00
700.0	10.00	35.01	699.0	-6,172.0	14.3	10.0	17.4	5.00	5.00	0.00
800.0	15.00	35.01	796.6	-6,074.4	32.0	22.4	39.0	5.00	5.00	0.00
900.0	20.00	35.01	891.9	-5,979.1	56.6	39.6	69.1	5.00	5.00	0.00
EOB;988.6' MD & 24.43° Inc										
988.6	24.43	35.01	974.0	-5,897.0	84.0	58.9	102.6	5.00	5.00	0.00
1,000.0	24.43	35.01	984.3	-5,886.7	87.9	61.6	107.3	0.00	0.00	0.00
1,100.0	24.43	35.01	1,075.4	-5,795.6	121.8	85.3	148.6	0.00	0.00	0.00
1,200.0	24.43	35.01	1,166.4	-5,704.6	155.6	109.0	190.0	0.00	0.00	0.00
1,300.0	24.43	35.01	1,257.4	-5,613.6	189.5	132.8	231.3	0.00	0.00	0.00
1,400.0	24.43	35.01	1,348.5	-5,522.5	223.4	156.5	272.7	0.00	0.00	0.00
1,500.0	24.43	35.01	1,439.5	-5,431.5	257.3	180.2	314.0	0.00	0.00	0.00
1,600.0	24.43	35.01	1,530.6	-5,340.4	291.2	203.9	355.4	0.00	0.00	0.00
1,700.0	24.43	35.01	1,621.6	-5,249.4	325.0	227.7	396.7	0.00	0.00	0.00
1,800.0	24.43	35.01	1,712.7	-5,158.3	358.9	251.4	438.1	0.00	0.00	0.00
1,900.0	24.43	35.01	1,803.7	-5,067.3	392.8	275.1	479.4	0.00	0.00	0.00
2,000.0	24.43	35.01	1,894.8	-4,976.2	426.7	298.9	520.7	0.00	0.00	0.00
2,100.0	24.43	35.01	1,985.8	-4,885.2	460.5	322.6	562.1	0.00	0.00	0.00
2,200.0	24.43	35.01	2,076.8	-4,794.2	494.4	346.3	603.4	0.00	0.00	0.00
2,300.0	24.43	35.01	2,167.9	-4,703.1	528.3	370.1	644.8	0.00	0.00	0.00
2,400.0	24.43	35.01	2,258.9	-4,612.1	562.2	393.8	686.1	0.00	0.00	0.00
2,500.0	24.43	35.01	2,350.0	-4,521.0	596.1	417.5	727.5	0.00	0.00	0.00
2,600.0	24.43	35.01	2,441.0	-4,430.0	629.9	441.2	768.8	0.00	0.00	0.00
2,700.0	24.43	35.01	2,532.1	-4,338.9	663.8	465.0	810.2	0.00	0.00	0.00
2,800.0	24.43	35.01	2,623.1	-4,247.9	697.7	488.7	851.5	0.00	0.00	0.00
2,900.0	24.43	35.01	2,714.2	-4,156.8	731.6	512.4	892.9	0.00	0.00	0.00
3,000.0	24.43	35.01	2,805.2	-4,065.8	765.4	536.2	934.2	0.00	0.00	0.00
Fruitland Coal										
3,041.5	24.43	35.01	2,843.0	-4,028.0	779.5	546.0	951.4	0.00	0.00	0.00
3,100.0	24.43	35.01	2,896.3	-3,974.7	799.3	559.9	975.6	0.00	0.00	0.00
3,200.0	24.43	35.01	2,987.3	-3,883.7	833.2	583.6	1,016.9	0.00	0.00	0.00
3,300.0	24.43	35.01	3,078.3	-3,792.7	867.1	607.4	1,058.3	0.00	0.00	0.00
3,400.0	24.43	35.01	3,169.4	-3,701.6	901.0	631.1	1,099.6	0.00	0.00	0.00
3,500.0	24.43	35.01	3,260.4	-3,610.6	934.8	654.8	1,141.0	0.00	0.00	0.00
3,600.0	24.43	35.01	3,351.5	-3,519.5	968.7	678.5	1,182.3	0.00	0.00	0.00
TD at 3653.3' MD										
3,653.3	24.43	35.01	3,400.0	-3,471.0	986.8	691.2	1,204.3	0.00	0.00	0.00

Mesa West Directional

Planning Report



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Project:	La Plata County, Co (Nad 83)	MD Reference:	Est RKB @ 6871.0usft (IGW 152)
Site:	Sec 15, T33N, R9W	North Reference:	True
Well:	IGW 152	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	#2		

Design Targets										
Target Name										
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)			
Terrell #1A Est W/H	0.00	0.00	0.0	34.8	17.4	1,166,516.31	2,323,814.54	37° 6' 3.332 N	107° 49' 7.286 W	
- plan misses target center by 38.9usft at 0.0usft MD (0.0 TVD, 0.0 N, 0.0 E)										
- Point										
IGW 106 Est W/H	0.00	0.00	0.0	11.6	-22.3	1,166,494.08	2,323,774.36	37° 6' 3.103 N	107° 49' 7.775 W	
- plan misses target center by 25.1usft at 0.0usft MD (0.0 TVD, 0.0 N, 0.0 E)										
- Point										
IGW 152 BHL	0.00	0.00	3,400.0	986.8	691.2	1,167,451.24	2,324,511.80	37° 6' 12.744 N	107° 48' 58.968 W	
- plan hits target center										
- Point										

Formations						
Measured Depth	Vertical Depth	Subsea Depth	Name	Lithology	Dip	Dip Direction
(usft)	(usft)	(usft)			(°)	(°)
3,041.5	2,843.0	4,028.0	Fruitland Coal		0.00	

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(usft)	(usft)	+N/-S	+E/-W	Comment	
(usft)	(usft)	(usft)	(usft)		
500.0	500.0	0.0	0.0	KOP;500'	
988.6	974.0	84.0	58.9	EOB;988.6' MD & 24.43° Inc	
3,653.3	3,400.0	986.8	691.2	TD at 3653.3' MD	