



Elm Ridge Exploration Company

La Plata County, Colorado

Sec 18-T33N-R7W

IGE 116

Wellbore #1

Plan: Design #1

Standard Planning Report

26 February, 2013

Elm Ridge Exploration Company

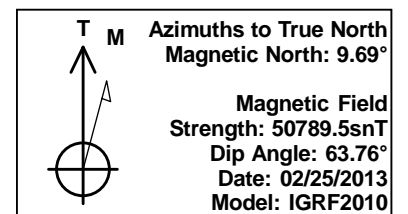
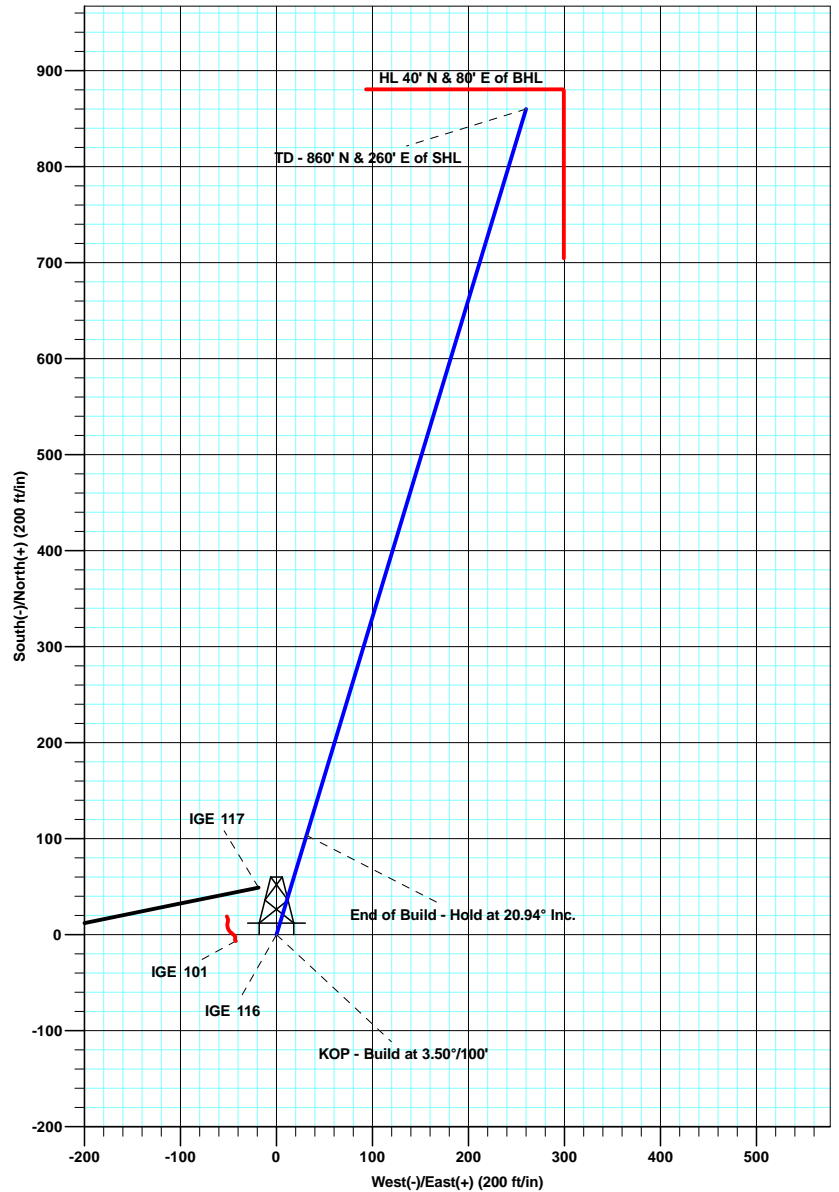
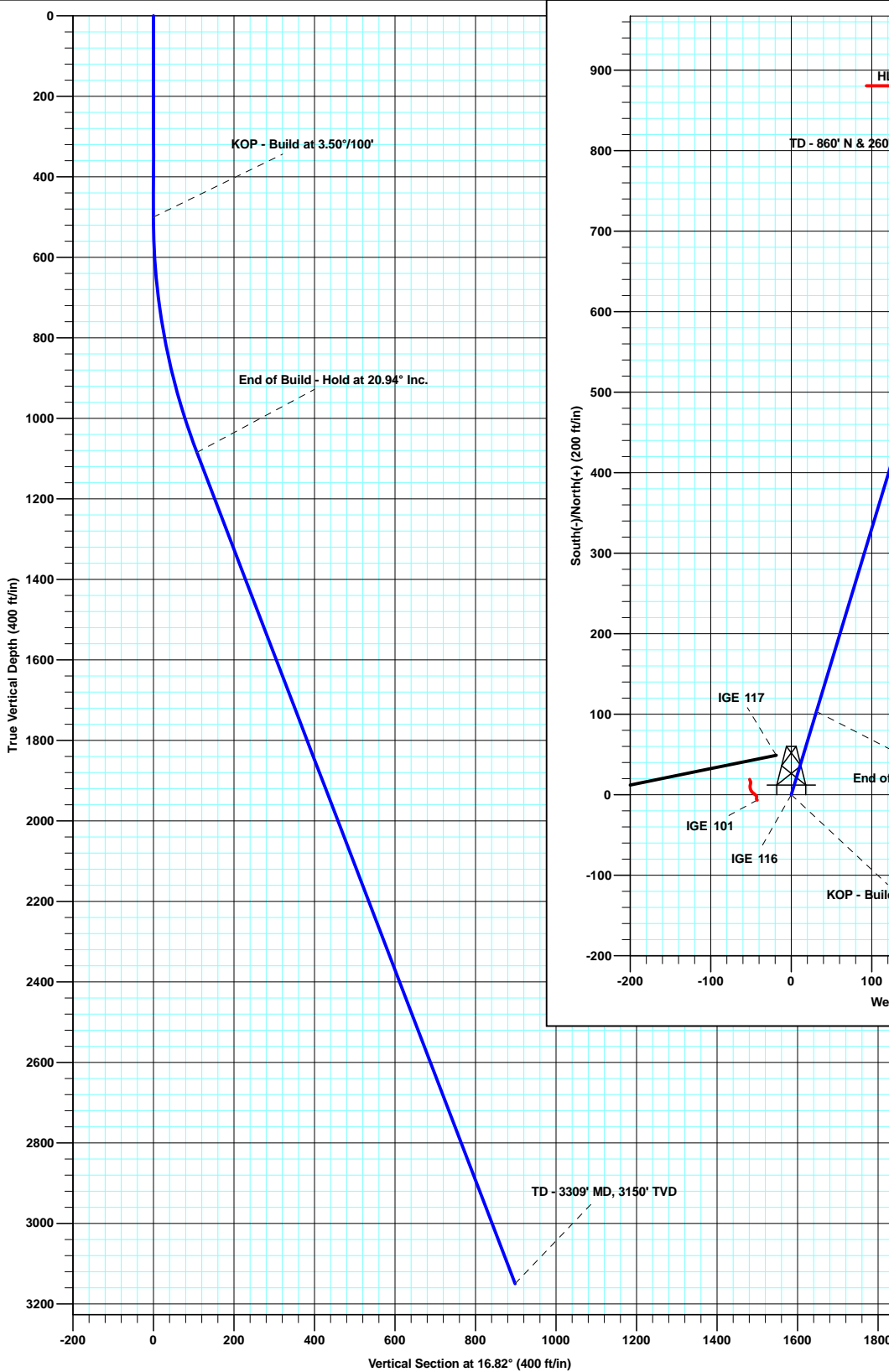
Site: Sec 18-T33N-R7W
Well: IGE 116
Wellbore: Wellbore #1
Design: Design #1

Reference Details - WELL CENTRE
Geodetic System: US State Plane 1983
Ellipsoid: GRS 1980
Zone: Colorado Southern Zone
Northing: 1167629.03
Easting: 2371985.91
Latitude: 37° 6' 25.6857 N
Longitude: 107° 39' 13.2696 W
Grid Convergence: 1.32° East
Ground Elevation: 6532.00
KB Elevation: WELL @ 6532.00ft (Original Well Elev)



ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	Vsect	Departure	Annotation
500.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	KOP - Build at 3.50°/100'
1085.15	1098.39	20.94	16.82	103.53	31.30	108.15	108.15	End of Build - Hold at 20.94° Inc.
3150.00	3309.31	20.94	16.82	860.00	260.00	898.44	898.44	TD - 3309' MD, 3150' TVD, 860° N & 260° E of SHL



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well IGE 116
Company:	Elm Ridge Exploration Company	TVD Reference:	WELL @ 6532.00ft (Original Well Elev)
Project:	La Plata County, Colorado	MD Reference:	WELL @ 6532.00ft (Original Well Elev)
Site:	Sec 18-T33N-R7W	North Reference:	True
Well:	IGE 116	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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

Site	Sec 18-T33N-R7W				
Site Position:		Northing:	1,165,323.24 ft	Latitude:	37° 6' 2.7360 N
From:	Lat/Long	Easting:	2,371,289.76 ft	Longitude:	107° 39' 21.2040 W
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.32

Well	IGE 116					
Well Position	+N/-S	2,321.23 ft	Northing:	1,167,629.02 ft	Latitude:	37° 6' 25.6857 N
	+E/-W	642.75 ft	Easting:	2,371,985.91 ft	Longitude:	107° 39' 13.2696 W
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	6,532.00 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	02/25/13	9.69	63.76	50,790

Design	Design #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	16.82

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	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	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,098.39	20.94	16.82	1,085.15	103.53	31.30	3.50	3.50	0.00	16.82	
3,309.31	20.94	16.82	3,150.00	860.00	260.00	0.00	0.00	0.00	0.00	IGE 116 TD

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well IGE 116
Company:	Elm Ridge Exploration Company	TVD Reference:	WELL @ 6532.00ft (Original Well Elev)
Project:	La Plata County, Colorado	MD Reference:	WELL @ 6532.00ft (Original Well Elev)
Site:	Sec 18-T33N-R7W	North Reference:	True
Well:	IGE 116	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP - Build at 3.50°/100'									
600.00	3.50	16.82	599.94	2.92	0.88	3.05	3.50	3.50	0.00
700.00	7.00	16.82	699.51	11.68	3.53	12.20	3.50	3.50	0.00
800.00	10.50	16.82	798.33	26.24	7.93	27.41	3.50	3.50	0.00
900.00	14.00	16.82	896.03	46.55	14.07	48.63	3.50	3.50	0.00
1,000.00	17.50	16.82	992.27	72.53	21.93	75.77	3.50	3.50	0.00
1,098.39	20.94	16.82	1,085.15	103.53	31.30	108.15	3.50	3.50	0.00
End of Build - Hold at 20.94° Inc.									
1,100.00	20.94	16.82	1,086.66	104.08	31.47	108.73	0.00	0.00	0.00
1,200.00	20.94	16.82	1,180.05	138.29	41.81	144.48	0.00	0.00	0.00
1,300.00	20.94	16.82	1,273.45	172.51	52.15	180.22	0.00	0.00	0.00
1,400.01	20.94	16.82	1,366.84	206.73	62.50	215.97	0.00	0.00	0.00
1,500.01	20.94	16.82	1,460.23	240.94	72.84	251.71	0.00	0.00	0.00
1,600.01	20.94	16.82	1,553.63	275.16	83.19	287.46	0.00	0.00	0.00
1,700.01	20.94	16.82	1,647.02	309.37	93.53	323.20	0.00	0.00	0.00
1,800.01	20.94	16.82	1,740.42	343.59	103.88	358.95	0.00	0.00	0.00
1,900.01	20.94	16.82	1,833.81	377.80	114.22	394.69	0.00	0.00	0.00
2,000.01	20.94	16.82	1,927.20	412.02	124.56	430.44	0.00	0.00	0.00
2,100.01	20.94	16.82	2,020.60	446.23	134.91	466.18	0.00	0.00	0.00
2,200.01	20.94	16.82	2,113.99	480.45	145.25	501.93	0.00	0.00	0.00
2,300.01	20.94	16.82	2,207.38	514.66	155.60	537.67	0.00	0.00	0.00
2,400.01	20.94	16.82	2,300.78	548.88	165.94	573.42	0.00	0.00	0.00
2,500.01	20.94	16.82	2,394.17	583.10	176.28	609.16	0.00	0.00	0.00
2,600.01	20.94	16.82	2,487.56	617.31	186.63	644.91	0.00	0.00	0.00
2,700.01	20.94	16.82	2,580.96	651.53	196.97	680.65	0.00	0.00	0.00
2,800.01	20.94	16.82	2,674.35	685.74	207.32	716.40	0.00	0.00	0.00
2,900.01	20.94	16.82	2,767.75	719.96	217.66	752.14	0.00	0.00	0.00
3,000.01	20.94	16.82	2,861.14	754.17	228.01	787.89	0.00	0.00	0.00
3,100.01	20.94	16.82	2,954.53	788.39	238.35	823.63	0.00	0.00	0.00
3,200.01	20.94	16.82	3,047.93	822.60	248.69	859.38	0.00	0.00	0.00
3,300.01	20.94	16.82	3,141.32	856.82	259.04	895.12	0.00	0.00	0.00
3,309.31	20.94	16.82	3,150.00	860.00	260.00	898.44	0.00	0.00	0.00
TD - 3309' MD, 3150' TVD, 860' N & 260' E of SHL									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
IGE 116 TD	0.00	0.00	3,150.00	860.00	260.00	1,168,482.80	2,372,265.67	37° 6' 34.1885 N	107° 39' 10.0600 W
- hit/miss target									
- Shape									
- plan hits target center									
- Point									

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
500.00	500.00	0.00	0.00	KOP - Build at 3.50°/100'
1,098.39	1,085.15	103.53	31.30	End of Build - Hold at 20.94° Inc.
3,309.31	3,150.00	860.00	260.00	TD - 3309' MD, 3150' TVD, 860' N & 260' E of SHL



Elm Ridge Exploration Company

La Plata County, Colorado

Sec 18-T33N-R7W

IGE 116

Wellbore #1

Design #1

Anticollision Report

26 February, 2013

Company:	Elm Ridge Exploration Company	Local Co-ordinate Reference:	Well IGE 116
Project:	La Plata County, Colorado	TVD Reference:	WELL @ 6532.00ft (Original Well Elev)
Reference Site:	Sec 18-T33N-R7W	MD Reference:	WELL @ 6532.00ft (Original Well Elev)
Site Error:	0.00 ft	North Reference:	True
Reference Well:	IGE 116	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Reference	Design #1		
Filter type:	GLOBAL FILTER APPLIED: All wellpaths within 200'+ 100/1000 of reference		
Interpolation Method:	MD Interval 100.00ft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 530.93 ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	02/26/13		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.00	3,309.31	Design #1 (Wellbore #1)	MWD	MWD - Standard	

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Sec 18-T33N-R7W						
IGE 101 - Wellbore #1 - Wellbore #1	446.73	451.75	42.87	40.95	22.285	CC
IGE 101 - Wellbore #1 - Wellbore #1	500.00	504.89	42.96	40.78	19.694	ES
IGE 101 - Wellbore #1 - Wellbore #1	700.00	704.17	49.41	46.28	15.791	SF
IGE 117 - Wellbore #1 - Design #1	690.18	692.25	49.12	46.25	17.138	CC
IGE 117 - Wellbore #1 - Design #1	700.00	701.71	49.15	46.25	16.899	ES
IGE 117 - Wellbore #1 - Design #1	800.00	796.12	56.31	52.90	16.488	SF

Offset Design Sec 18-T33N-R7W - IGE 101 - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 100-Drop Gyro													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.00	0.00	4.99	4.99	0.00	0.01	-98.84	-6.59	-42.37	42.87	42.87	0.01	6,290.823		
100.00	100.00	104.79	104.79	0.11	0.15	-98.22	-6.17	-42.71	43.15	42.89	0.26	167.538		
200.00	200.00	205.00	205.00	0.34	0.40	-96.96	-5.26	-43.07	43.39	42.65	0.74	58.559		
300.00	300.00	305.14	305.13	0.56	0.66	-95.51	-4.16	-43.04	43.24	42.03	1.22	35.476		
400.00	400.00	405.14	405.12	0.79	0.91	-94.03	-3.02	-42.83	42.94	41.24	1.70	25.294		
446.73	446.73	451.75	451.73	0.89	1.03	-93.34	-2.49	-42.80	42.87	40.95	1.92	22.285	CC	
500.00	500.00	504.89	504.86	1.01	1.17	-92.52	-1.89	-42.92	42.96	40.78	2.18	19.694	ES	
600.00	599.94	604.61	604.58	1.24	1.42	-111.63	-0.86	-43.55	44.60	41.94	2.66	16.788		
700.00	699.50	704.17	704.13	1.48	1.66	-120.23	0.02	-44.49	49.41	46.28	3.13	15.791	SF	
800.00	798.32	803.03	802.98	1.74	1.91	-131.74	0.82	-45.48	59.15	55.54	3.61	16.375		
900.00	896.03	900.83	900.77	2.08	2.14	-142.67	1.47	-46.39	75.42	71.33	4.09	18.431		
1,000.00	992.26	997.19	997.13	2.50	2.38	-151.26	2.01	-47.18	98.73	94.17	4.56	21.660		
1,100.00	1,086.66	1,091.93	1,091.86	3.03	2.63	-157.47	2.60	-47.84	128.79	123.77	5.01	25.681		
1,200.00	1,180.05	1,185.59	1,185.52	3.62	2.87	-161.96	3.29	-48.42	162.38	156.85	5.53	29.370		
1,300.00	1,273.44	1,279.14	1,279.07	4.25	3.12	-164.91	3.99	-48.99	196.54	190.49	6.05	32.467		
1,400.00	1,366.84	1,372.97	1,372.89	4.89	3.37	-167.00	4.71	-49.54	231.00	224.41	6.59	35.070		
1,500.00	1,460.23	1,466.94	1,466.86	5.54	3.62	-168.56	5.52	-49.98	265.53	258.41	7.13	37.261		
1,600.00	1,553.62	1,561.01	1,560.92	6.20	3.87	-169.76	6.44	-50.35	300.07	292.40	7.67	39.124		
1,700.00	1,647.02	1,655.20	1,655.11	6.87	4.11	-170.71	7.50	-50.70	334.57	326.36	8.22	40.721		
1,800.00	1,740.41	1,749.34	1,749.24	7.54	4.36	-171.48	8.66	-50.98	369.01	360.25	8.76	42.106		
1,900.00	1,833.80	1,843.54	1,843.43	8.21	4.60	-172.14	9.86	-51.15	403.42	394.11	9.31	43.333		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	Elm Ridge Exploration Company	Local Co-ordinate Reference:	Well IGE 116
Project:	La Plata County, Colorado	TVD Reference:	WELL @ 6532.00ft (Original Well Elev)
Reference Site:	Sec 18-T33N-R7W	MD Reference:	WELL @ 6532.00ft (Original Well Elev)
Site Error:	0.00 ft	North Reference:	True
Reference Well:	IGE 116	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design Sec 18-T33N-R7W - IGE 101 - Wellbore #1 - Wellbore #1												Offset Site Error:	0.00 ft
Survey Program: 100-Drop Gyro												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
2,000.00	1,927.20	1,937.77	1,937.66	8.88	4.83	-172.71	11.10	-51.13	437.76	427.91	9.85	44.439	
2,100.00	2,020.59	2,031.98	2,031.85	9.56	5.05	-173.23	12.30	-50.91	472.08	461.70	10.39	45.454	
2,200.00	2,113.98	2,126.55	2,126.41	10.24	5.28	-173.67	13.66	-50.66	506.29	495.36	10.92	46.346	

Company:	Elm Ridge Exploration Company	Local Co-ordinate Reference:	Well IGE 116
Project:	La Plata County, Colorado	TVD Reference:	WELL @ 6532.00ft (Original Well Elev)
Reference Site:	Sec 18-T33N-R7W	MD Reference:	WELL @ 6532.00ft (Original Well Elev)
Site Error:	0.00 ft	North Reference:	True
Reference Well:	IGE 116	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

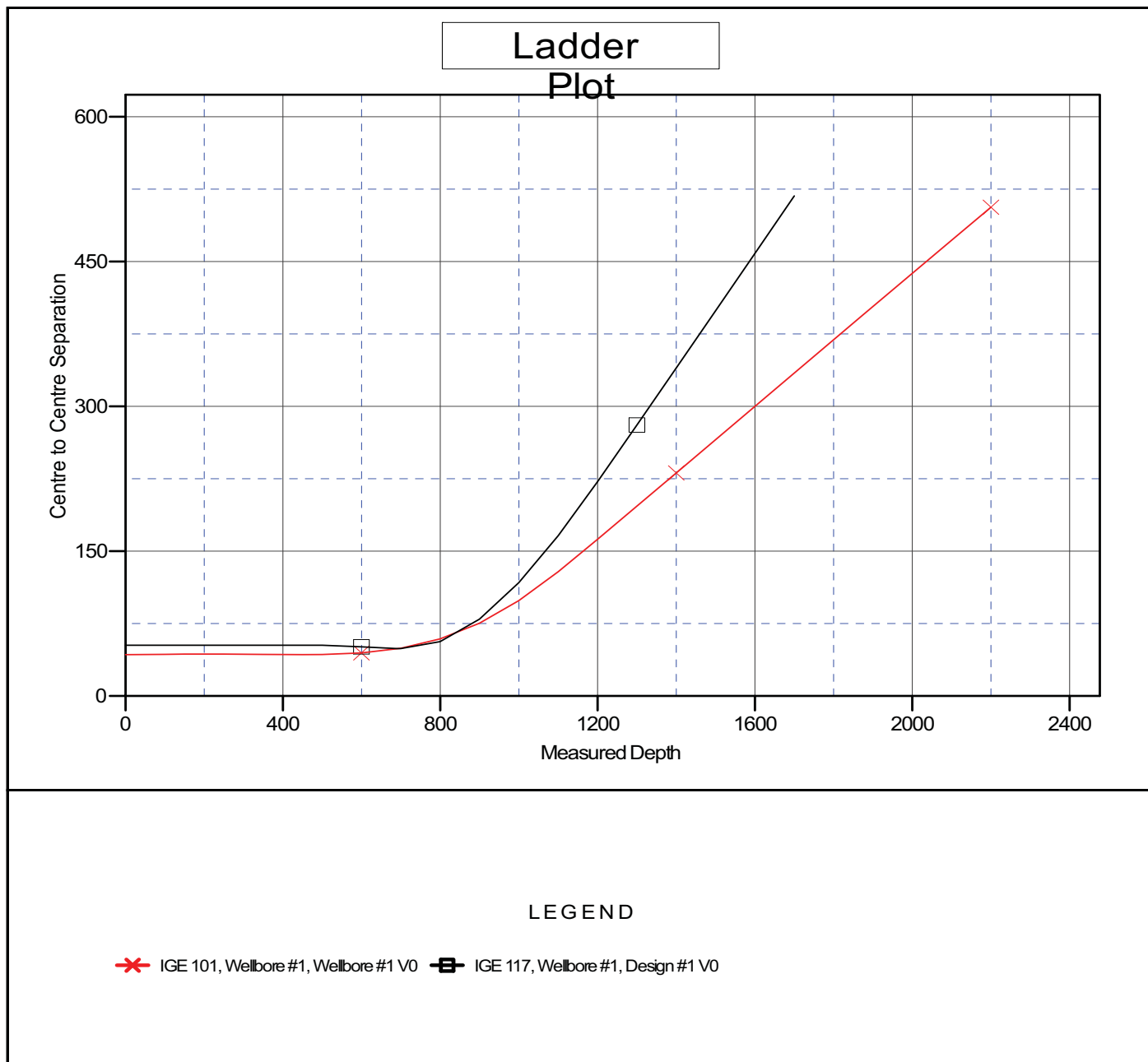
Offset Design Sec 18-T33N-R7W - IGE 117 - Wellbore #1 - Design #1												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
0.00	0.00	5.00	5.00	0.00	0.01	-20.79	49.16	-18.66	52.58	52.58	0.01	9,052.055	
100.00	100.00	105.00	105.00	0.11	0.12	-20.79	49.16	-18.66	52.58	52.35	0.24	222.813	
200.00	200.00	205.00	205.00	0.34	0.35	-20.79	49.16	-18.66	52.58	51.90	0.69	76.706	
300.00	300.00	305.00	305.00	0.56	0.57	-20.79	49.16	-18.66	52.58	51.45	1.14	46.327	
400.00	400.00	405.00	405.00	0.79	0.80	-20.79	49.16	-18.66	52.58	51.00	1.58	33.185	
464.91	464.91	469.91	469.91	0.93	0.94	-20.79	49.16	-18.66	52.58	50.71	1.88	28.024	
500.00	500.00	504.97	504.97	1.01	1.02	-20.80	49.16	-18.67	52.59	50.55	2.03	25.861	
600.00	599.94	604.17	604.10	1.24	1.23	-43.41	48.50	-21.91	50.96	48.49	2.47	20.634	
690.18	689.75	692.25	691.80	1.46	1.43	-58.81	46.91	-29.71	49.12	46.25	2.87	17.138 CC	
700.00	699.50	701.71	701.20	1.48	1.45	-61.06	46.68	-30.83	49.15	46.25	2.91	16.899 ES	
800.00	798.32	796.12	794.51	1.74	1.70	-86.77	43.82	-44.83	56.31	52.90	3.42	16.488 SF	
900.00	896.03	886.12	882.55	2.08	2.01	-107.85	40.10	-63.08	79.59	75.60	4.00	19.921	
1,000.00	992.26	970.70	964.24	2.50	2.38	-120.18	35.72	-84.51	117.36	112.76	4.60	25.496	
1,100.00	1,086.66	1,049.14	1,038.89	3.03	2.80	-126.86	30.91	-108.06	166.15	160.91	5.24	31.725	
1,200.00	1,180.05	1,122.41	1,107.52	3.62	3.24	-131.68	25.78	-133.21	222.04	216.14	5.89	37.681	
1,300.00	1,273.44	1,201.65	1,180.97	4.25	3.79	-134.73	19.83	-162.33	280.74	274.19	6.54	42.894	
1,400.00	1,366.84	1,281.84	1,255.30	4.89	4.37	-136.76	13.81	-191.82	339.82	332.61	7.21	47.138	
1,500.00	1,460.23	1,362.03	1,329.63	5.54	4.96	-138.20	7.79	-221.32	399.09	391.20	7.90	50.544	
1,600.00	1,553.62	1,442.22	1,403.95	6.20	5.56	-139.27	1.77	-250.81	458.49	449.89	8.60	53.287	
1,700.00	1,647.02	1,522.41	1,478.28	6.87	6.17	-140.09	-4.25	-280.30	517.97	508.65	9.32	55.569	

Company: Elm Ridge Exploration Company
Project: La Plata County, Colorado
Reference Site: Sec 18-T33N-R7W
Site Error: 0.00 ft
Reference Well: IGE 116
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well IGE 116
TVD Reference: WELL @ 6532.00ft (Original Well Elev)
MD Reference: WELL @ 6532.00ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to WELL @ 6532.00ft (Original Well Ele
Offset Depths are relative to Offset Datum
Central Meridian is 105° 30' 0.0000 W

Coordinates are relative to: IGE 116
Coordinate System is US State Plane 1983, Colorado Southern Zone
Grid Convergence at Surface is: -1.32°



Company:	Elm Ridge Exploration Company	Local Co-ordinate Reference:	Well IGE 116
Project:	La Plata County, Colorado	TVD Reference:	WELL @ 6532.00ft (Original Well Elev)
Reference Site:	Sec 18-T33N-R7W	MD Reference:	WELL @ 6532.00ft (Original Well Elev)
Site Error:	0.00 ft	North Reference:	True
Reference Well:	IGE 116	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 6532.00ft (Original Well Ele

Offset Depths are relative to Offset Datum

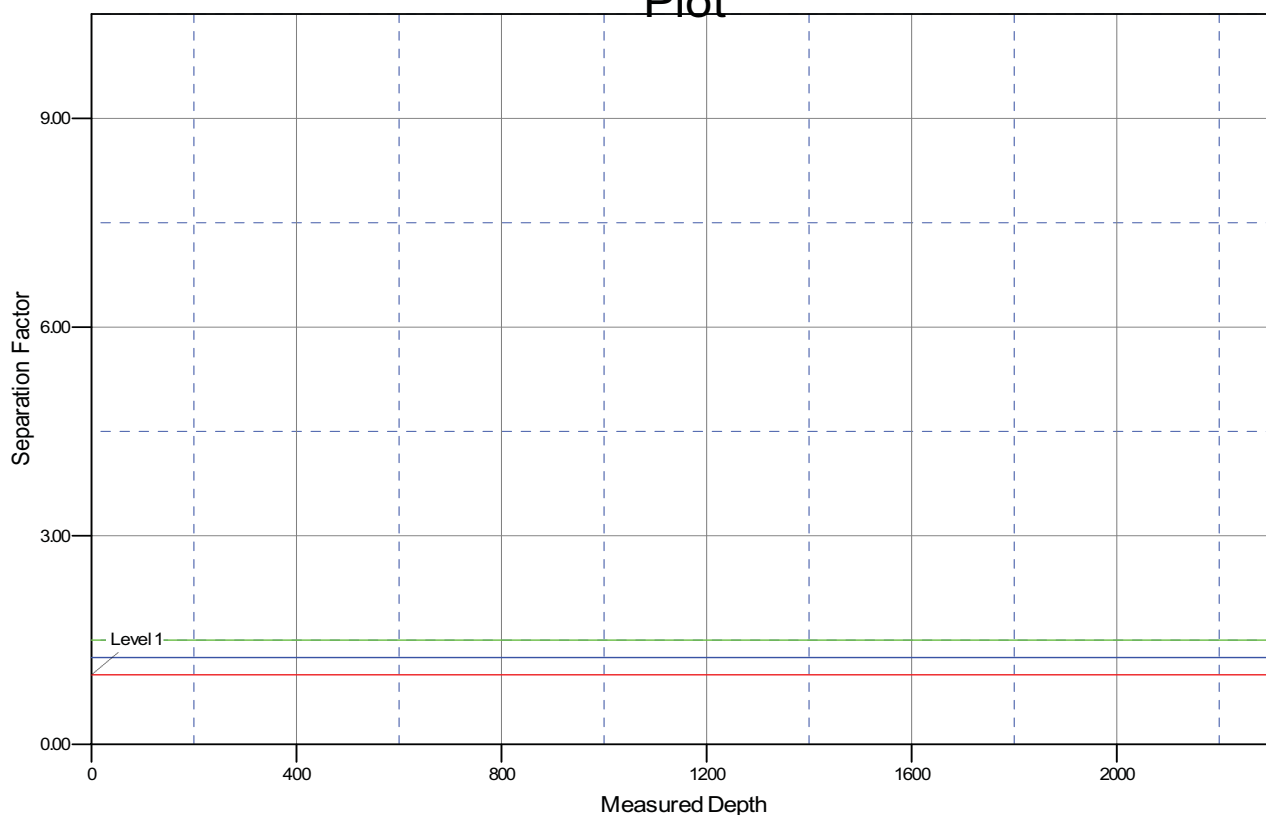
Central Meridian is 105° 30' 0.0000 W

Coordinates are relative to: IGE 116

Coordinate System is US State Plane 1983, Colorado Southern Zone

Grid Convergence at Surface is: -1.32°

Separation Factor Plot



LEGEND

✖ IGE 101, Wellbore #1, Wellbore #1 V0 ⊠ IGE 117, Wellbore #1, Design #1 V0