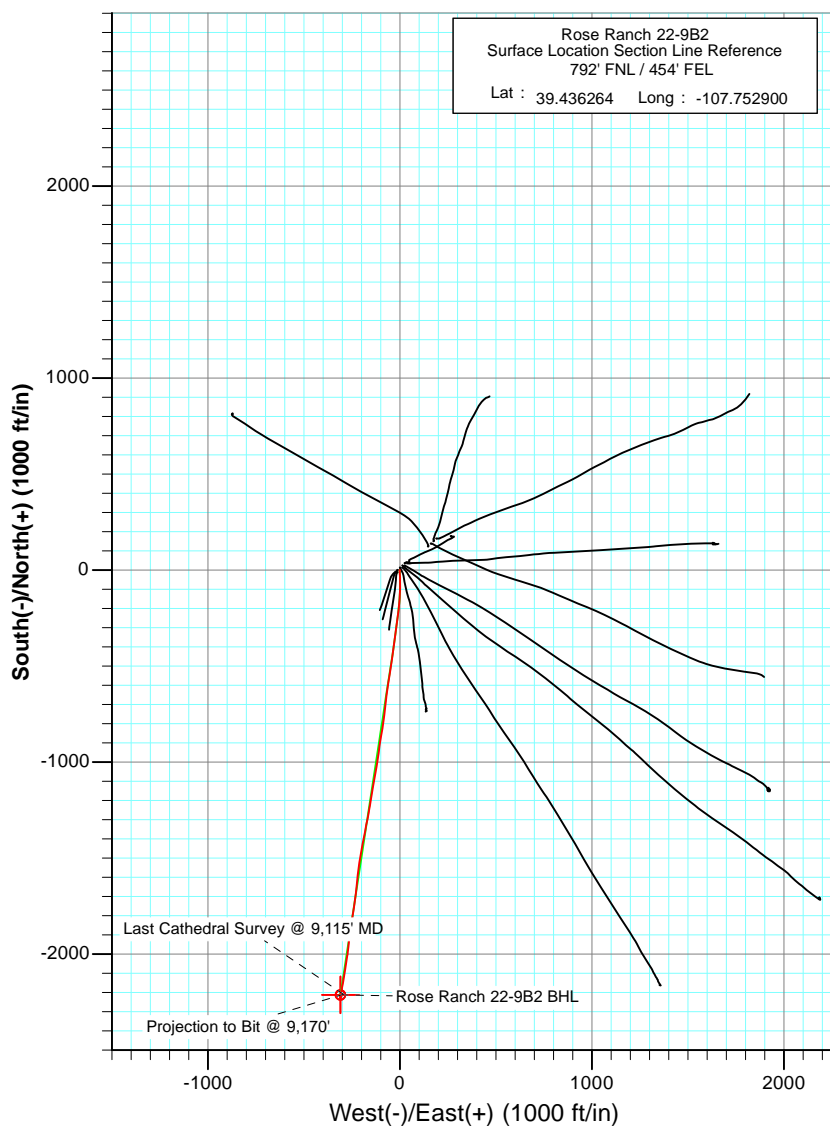
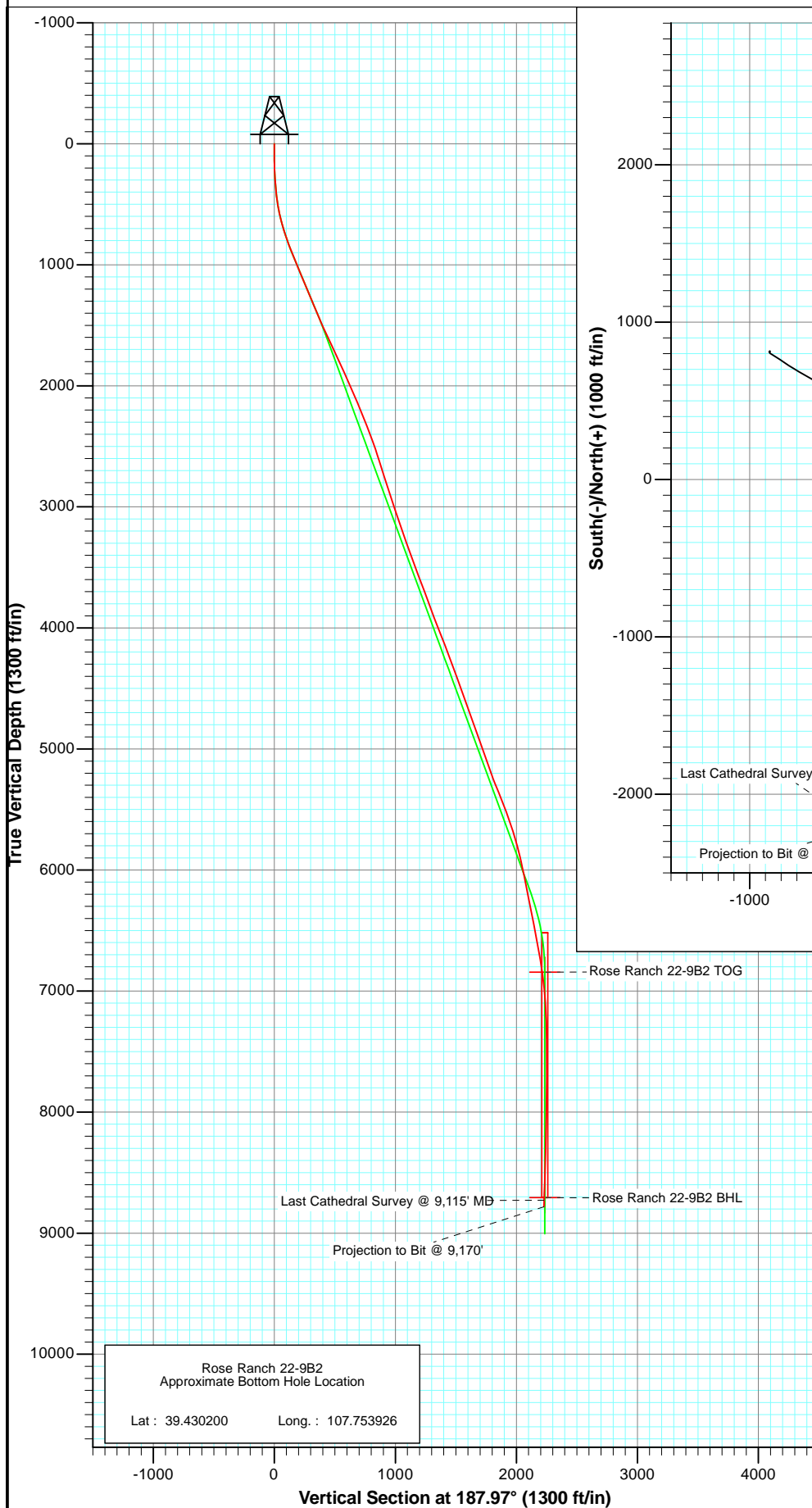




Project: Mamm Creek
Site: A22W Pad (S22-T7S-R93W)
Well: Rose Ranch 22-9B2
Wellbore: DD
Plan: FINAL



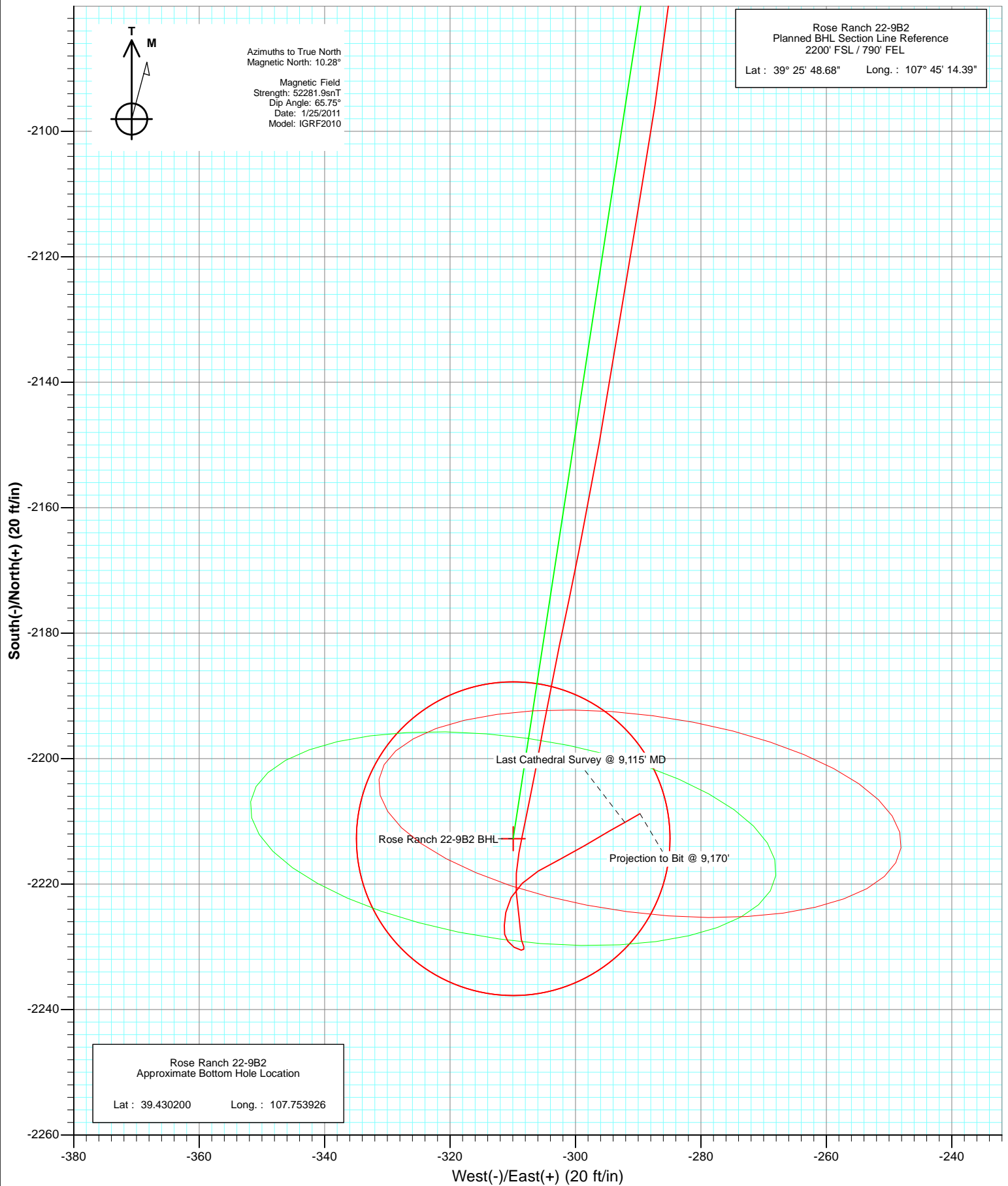
Azimuths to True North
Magnetic North: 10.28°

Magnetic Field
Strength: 52281.9snT
Dip Angle: 65.75°
Date: 1/25/2011
Model: IGRF2010

DESIGN DETAILS: DD				
Job #105520 (SH), 115046: KR				
WELL @ 6806.0ft (Nabors M13)				
Target	Azimuth	Origin Type	N/S	E/W From TVD
Rose Ranch 22-9B2 BHL	187.97	Slot	0.0	0.0 0.0

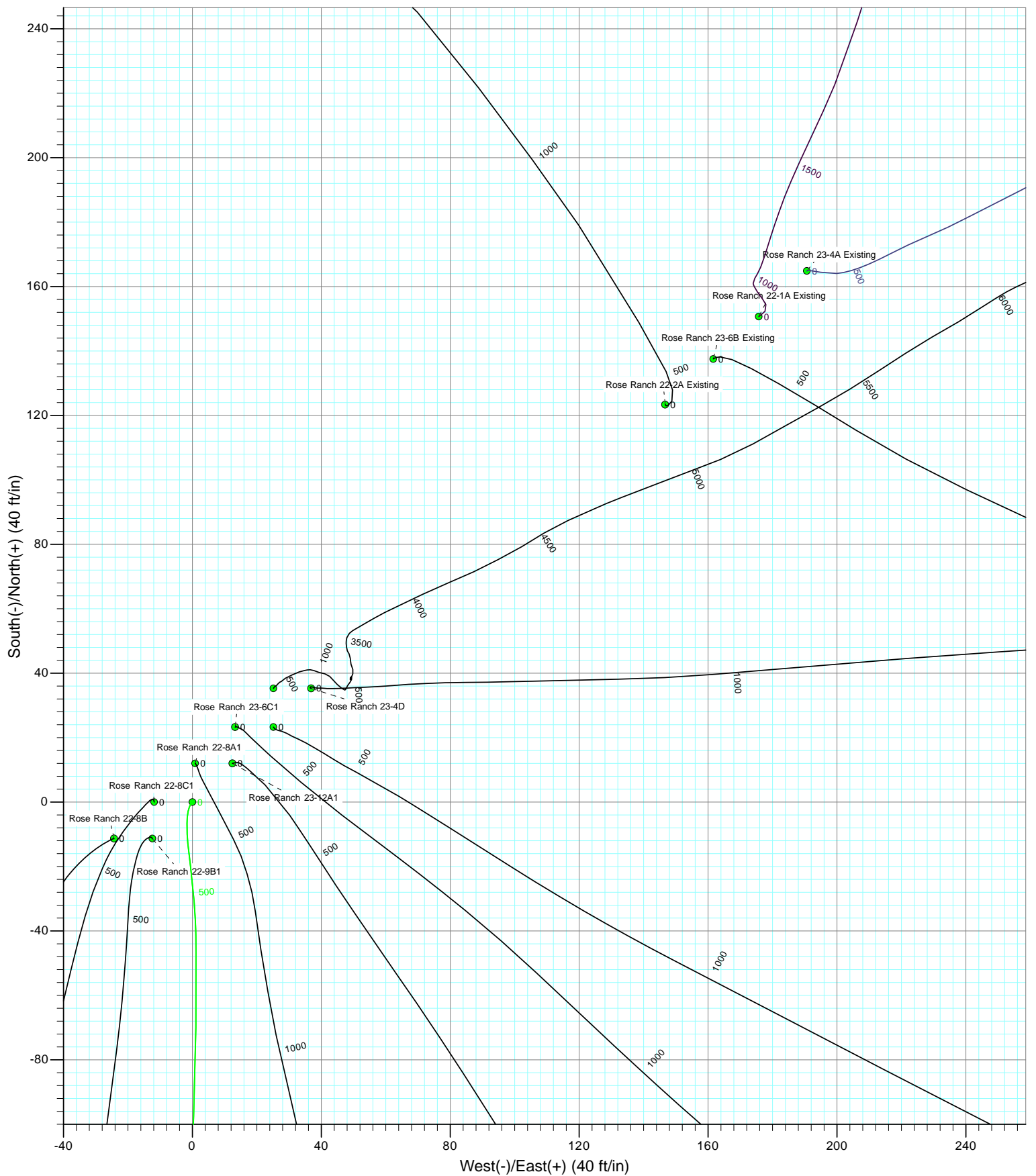


Project: Mamm Creek
Site: A22W Pad (S22-T7S-R93W)
Well: Rose Ranch 22-9B2
Wellbore: DD
Plan: DD





Project: Mamm Creek
Site: A22W Pad (S22-T7S-R93W)
Well: Rose Ranch 22-9B2
Wellbore: DD
Design: DD



Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Rose Ranch 22-9B2
Project:	Mamm Creek	TVD Reference:	WELL @ 6806.0ft (Nabors M13)
Site:	A22W Pad (S22-T7S-R93W)	MD Reference:	WELL @ 6806.0ft (Nabors M13)
Well:	Rose Ranch 22-9B2	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	EDM 5000.1 US Multi Users DB

Project	Mamm Creek		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site		A22W Pad (S22-T7S-R93W)			
Site Position:		Northing:	1,591,715.91 ft	Latitude:	39.436361
From:	Lat/Long	Easting:	2,363,798.79 ft	Longitude:	-107.752769
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.42 °

Well	Rose Ranch 22-9B2					
Well Position	+N/-S	0.0 ft	Northing:	1,591,681.49 ft	Latitude:	39.436264
	+E/-W	0.0 ft	Easting:	2,363,760.93 ft	Longitude:	-107.752900
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	6,784.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/25/2011	10.28	65.75	52,282

Design	DD				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.0	0.0	0.0	187.97	

Survey Program	Date	2/3/2011			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
109.0	1,387.0	Survey #1 (DD)	MWD	Geolink MWD	
1,543.0	9,170.0	Survey #2 (DD)	MWD	Geolink MWD	

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
109.0	0.10	165.00	109.0	-0.1	0.0	0.1	0.09	0.09	
140.0	0.50	239.50	140.0	-0.2	-0.1	0.2	1.56	1.29	
170.0	0.90	228.70	170.0	-0.4	-0.4	0.5	1.40	1.33	
201.0	1.70	201.70	201.0	-1.0	-0.7	1.1	3.18	2.58	
231.0	2.60	199.00	231.0	-2.1	-1.1	2.2	3.02	3.00	
262.0	3.10	188.70	261.9	-3.5	-1.5	3.7	2.30	1.61	
292.0	3.60	181.60	291.9	-5.3	-1.6	5.5	2.16	1.67	
323.0	4.40	180.80	322.8	-7.5	-1.7	7.6	2.59	2.58	
354.0	5.00	176.90	353.7	-10.0	-1.6	10.1	2.19	1.94	
384.0	5.60	175.50	383.6	-12.8	-1.4	12.8	2.05	2.00	
415.0	6.50	172.40	414.4	-16.0	-1.1	16.0	3.09	2.90	

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Rose Ranch 22-9B2
Project:	Mamm Creek	TVD Reference:	WELL @ 6806.0ft (Nabors M13)
Site:	A22W Pad (S22-T7S-R93W)	MD Reference:	WELL @ 6806.0ft (Nabors M13)
Well:	Rose Ranch 22-9B2	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	EDM 5000.1 US Multi Users DB

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
506.0	9.70	174.50	504.5	-28.7	0.3	28.4	3.53	3.52	
598.0	13.00	180.00	594.7	-46.8	1.1	46.2	3.77	3.59	
689.0	16.40	180.20	682.7	-69.9	1.0	69.1	3.74	3.74	
781.0	18.60	182.40	770.4	-97.5	0.4	96.6	2.50	2.39	
873.0	21.50	182.50	856.8	-129.1	-1.0	127.9	3.15	3.15	
969.0	22.20	185.40	945.9	-164.7	-3.4	163.6	1.34	0.73	
1,064.0	23.00	184.70	1,033.6	-201.1	-6.6	200.0	0.89	0.84	
1,159.0	22.40	187.50	1,121.3	-237.5	-10.5	236.7	1.30	-0.63	
1,252.0	22.60	188.20	1,207.2	-272.8	-15.4	272.3	0.36	0.22	
1,347.0	22.80	188.70	1,294.8	-309.0	-20.8	308.9	0.29	0.21	
1,387.0	23.30	187.00	1,331.7	-324.5	-22.9	324.6	2.08	1.25	Last Cathedral Survey @ 1,387' MD
1,543.0	23.10	186.90	1,475.0	-385.5	-30.4	386.0	0.13	-0.13	
1,638.0	24.90	188.20	1,561.8	-423.8	-35.4	424.7	1.97	1.89	
1,734.0	25.20	187.70	1,648.8	-464.1	-41.1	465.3	0.38	0.31	
1,829.0	24.70	189.40	1,734.9	-503.7	-47.0	505.4	0.92	-0.53	
1,924.0	24.80	189.50	1,821.2	-542.9	-53.5	545.1	0.11	0.11	
2,019.0	24.70	188.20	1,907.5	-582.2	-59.7	584.9	0.58	-0.11	
2,115.0	24.00	188.30	1,994.9	-621.4	-65.3	624.5	0.73	-0.73	
2,210.0	23.20	187.30	2,082.0	-659.1	-70.5	662.5	0.94	-0.84	
2,305.0	22.50	186.20	2,169.5	-695.7	-74.9	699.4	0.86	-0.74	
2,400.0	21.40	185.40	2,257.6	-731.1	-78.4	734.9	1.20	-1.16	
2,495.0	20.90	188.50	2,346.2	-765.1	-82.6	769.1	1.29	-0.53	
2,591.0	20.10	187.30	2,436.2	-798.4	-87.2	802.7	0.94	-0.83	
2,686.0	19.40	190.00	2,525.6	-830.1	-92.0	834.8	1.21	-0.74	
2,781.0	17.90	190.50	2,615.6	-860.0	-97.4	865.2	1.59	-1.58	
2,877.0	17.90	188.50	2,706.9	-889.1	-102.3	894.7	0.64	0.00	
2,972.0	17.70	188.80	2,797.4	-917.8	-106.7	923.7	0.23	-0.21	
3,067.0	18.00	188.00	2,887.8	-946.6	-110.9	952.8	0.41	0.32	
3,163.0	18.00	186.10	2,979.1	-976.0	-114.6	982.5	0.61	0.00	
3,258.0	18.20	187.90	3,069.4	-1,005.3	-118.2	1,012.0	0.63	0.21	
3,353.0	19.20	191.10	3,159.4	-1,035.4	-123.2	1,042.4	1.51	1.05	
3,448.0	20.30	191.20	3,248.8	-1,066.9	-129.4	1,074.5	1.16	1.16	
3,543.0	20.30	189.80	3,337.9	-1,099.3	-135.4	1,107.4	0.51	0.00	
3,639.0	19.70	187.90	3,428.1	-1,131.7	-140.5	1,140.2	0.92	-0.62	
3,734.0	20.00	189.70	3,517.5	-1,163.6	-145.4	1,172.5	0.72	0.32	
3,829.0	20.70	190.20	3,606.6	-1,196.1	-151.1	1,205.5	0.76	0.74	
3,924.0	20.30	188.20	3,695.5	-1,229.0	-156.4	1,238.8	0.85	-0.42	
4,020.0	20.40	191.40	3,785.6	-1,261.8	-162.1	1,272.1	1.16	0.10	
4,115.0	20.20	191.40	3,874.7	-1,294.1	-168.6	1,305.0	0.21	-0.21	
4,210.0	21.80	191.00	3,963.3	-1,327.5	-175.3	1,339.0	1.69	1.68	
4,305.0	21.70	189.30	4,051.6	-1,362.2	-181.5	1,374.2	0.67	-0.11	
4,401.0	21.10	191.10	4,141.0	-1,396.7	-187.7	1,409.2	0.93	-0.62	
4,496.0	20.50	191.90	4,229.8	-1,429.7	-194.4	1,442.9	0.70	-0.63	
4,591.0	20.00	191.50	4,318.9	-1,461.9	-201.0	1,475.7	0.55	-0.53	
4,687.0	20.10	188.30	4,409.1	-1,494.3	-206.7	1,508.6	1.15	0.10	
4,783.0	19.80	188.50	4,499.3	-1,526.7	-211.5	1,541.3	0.32	-0.31	
4,878.0	19.30	187.80	4,588.8	-1,558.2	-216.0	1,573.1	0.58	-0.53	
4,973.0	20.40	185.70	4,678.2	-1,590.2	-219.8	1,605.3	1.38	1.16	
5,069.0	19.90	186.50	4,768.3	-1,623.1	-223.3	1,638.4	0.59	-0.52	
5,164.0	19.10	185.50	4,857.9	-1,654.6	-226.6	1,670.1	0.91	-0.84	
5,260.0	19.50	185.70	4,948.5	-1,686.2	-229.7	1,701.8	0.42	0.42	
5,356.0	19.90	189.40	5,038.9	-1,718.3	-234.0	1,734.1	1.36	0.42	
5,451.0	19.00	188.60	5,128.4	-1,749.5	-238.9	1,765.8	0.99	-0.95	

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Rose Ranch 22-9B2
Project:	Mamm Creek	TVD Reference:	WELL @ 6806.0ft (Nabors M13)
Site:	A22W Pad (S22-T7S-R93W)	MD Reference:	WELL @ 6806.0ft (Nabors M13)
Well:	Rose Ranch 22-9B2	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	EDM 5000.1 US Multi Users DB

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
5,546.0	19.90	189.20	5,218.0	-1,780.8	-243.8	1,797.4	0.97	0.95	
5,640.0	21.90	189.00	5,305.8	-1,813.9	-249.1	1,830.9	2.13	2.13	
5,735.0	22.10	187.80	5,393.9	-1,849.1	-254.3	1,866.5	0.52	0.21	
5,830.0	21.40	187.30	5,482.1	-1,884.0	-258.9	1,901.7	0.76	-0.74	
5,925.0	20.00	186.60	5,571.0	-1,917.3	-263.0	1,935.3	1.50	-1.47	
6,019.0	17.50	187.20	5,660.0	-1,947.3	-266.6	1,965.5	2.67	-2.66	
6,115.0	15.70	186.10	5,752.0	-1,974.6	-269.8	1,992.9	1.90	-1.87	
6,210.0	14.40	187.30	5,843.8	-1,999.1	-272.7	2,017.6	1.41	-1.37	
6,303.0	12.70	189.60	5,934.2	-2,020.6	-275.9	2,039.3	1.92	-1.83	
6,399.0	11.60	191.20	6,028.0	-2,040.5	-279.5	2,059.5	1.20	-1.15	
6,494.0	10.80	187.30	6,121.2	-2,058.7	-282.5	2,078.0	1.16	-0.84	
6,590.0	11.20	187.10	6,215.4	-2,076.9	-284.8	2,096.3	0.42	0.42	
6,686.0	11.80	188.30	6,309.5	-2,095.8	-287.3	2,115.4	0.67	0.62	
6,780.0	11.30	190.10	6,401.6	-2,114.4	-290.3	2,134.2	0.66	-0.53	
6,875.0	10.80	188.80	6,494.8	-2,132.4	-293.3	2,152.4	0.59	-0.53	
6,970.0	10.70	190.20	6,588.2	-2,149.8	-296.3	2,170.1	0.29	-0.11	
7,065.0	10.20	191.10	6,681.6	-2,166.8	-299.4	2,187.4	0.55	-0.53	
7,160.0	8.40	192.30	6,775.4	-2,181.8	-302.5	2,202.7	1.91	-1.89	
7,255.0	7.90	189.80	6,869.4	-2,195.0	-305.1	2,216.1	0.65	-0.53	
7,350.0	6.20	191.90	6,963.7	-2,206.5	-307.3	2,227.8	1.81	-1.79	
7,446.0	4.20	190.50	7,059.3	-2,215.0	-309.0	2,236.4	2.09	-2.08	
7,541.0	3.40	176.00	7,154.1	-2,221.2	-309.4	2,242.7	1.31	-0.84	
7,636.0	1.90	170.20	7,249.0	-2,225.6	-309.0	2,246.9	1.60	-1.58	
7,731.0	0.70	184.60	7,343.9	-2,227.7	-308.8	2,249.0	1.30	-1.26	
7,826.0	0.70	161.80	7,438.9	-2,228.9	-308.6	2,250.1	0.29	0.00	
7,921.0	0.70	160.70	7,533.9	-2,229.9	-308.2	2,251.1	0.01	0.00	
8,018.0	0.70	270.50	7,630.9	-2,230.5	-308.6	2,251.8	1.18	0.00	
8,111.0	0.90	307.10	7,723.9	-2,230.1	-309.8	2,251.5	0.58	0.22	
8,206.0	0.80	322.40	7,818.9	-2,229.1	-310.8	2,250.6	0.26	-0.11	
8,301.0	0.70	351.90	7,913.9	-2,228.0	-311.3	2,249.6	0.41	-0.11	
8,397.0	1.00	1.10	8,009.9	-2,226.6	-311.3	2,248.2	0.34	0.31	
8,492.0	1.50	10.10	8,104.9	-2,224.5	-311.1	2,246.2	0.56	0.53	
8,587.0	1.60	28.40	8,199.8	-2,222.1	-310.3	2,243.7	0.53	0.11	
8,682.0	1.90	46.10	8,294.8	-2,219.9	-308.5	2,241.2	0.65	0.32	
8,777.0	2.00	59.00	8,389.7	-2,217.9	-305.9	2,238.9	0.47	0.11	
8,872.0	2.70	63.50	8,484.6	-2,216.1	-302.5	2,236.6	0.76	0.74	
8,967.0	2.80	58.60	8,579.5	-2,213.9	-298.5	2,233.9	0.27	0.11	
9,061.0	2.90	60.60	8,673.4	-2,211.5	-294.5	2,231.0	0.15	0.11	
9,115.0	2.90	60.30	8,727.3	-2,210.1	-292.1	2,229.3	0.03	0.00	Last Cathedral Survey @ 9,115' MD
9,170.0	2.90	60.30	8,782.3	-2,208.8	-289.7	2,227.6	0.00	0.00	Projection to Bit @ 9,170'

Survey Report

Company: EnCana Oil & Gas (USA) Inc Project: Mamm Creek Site: A22W Pad (S22-T7S-R93W) Well: Rose Ranch 22-9B2 Wellbore: DD Design: DD	Local Co-ordinate Reference: Well Rose Ranch 22-9B2 TVD Reference: WELL @ 6806.0ft (Nabors M13) MD Reference: WELL @ 6806.0ft (Nabors M13) North Reference: True Survey Calculation Method: Minimum Curvature Database: EDM 5000.1 US Multi Users DB
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Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
Rose Ranch 22-9B2 BH	0.00	0.00	8,706.0	-2,212.7	-309.9	1,589,477.11	2,363,396.23	39.430189	-107.753997
- actual wellpath misses target center by 17.0ft at 9092.8ft MD (8705.2 TVD, -2210.7 N, -293.1 E)									
- Circle (radius 25.0)									
Rose Ranch 22-9B2 TO	0.00	0.00	6,843.0	-2,212.7	-309.9	1,589,477.11	2,363,396.23	39.430189	-107.753997
- actual wellpath misses target center by 21.8ft at 7231.5ft MD (6846.1 TVD, -2191.8 N, -304.6 E)									
- Point									

Design Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	
1,387.0	1,331.7	-324.5	-22.9	Last Cathedral Survey @ 1,387' MD
9,115.0	8,727.3	-2,210.1	-292.1	Last Cathedral Survey @ 9,115' MD
9,170.0	8,782.3	-2,208.8	-289.7	Projection to Bit @ 9,170'

Checked By: _____	Approved By: _____	Date: _____
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