



## **END OF WELL REPORT**

**Prepared For:**

**Kerr-McGee Oil & Gas Onshore LP  
VJ QO UGP 7/9 PAD  
VJ QO UGP 35P-3: HZ  
WELD,CO**

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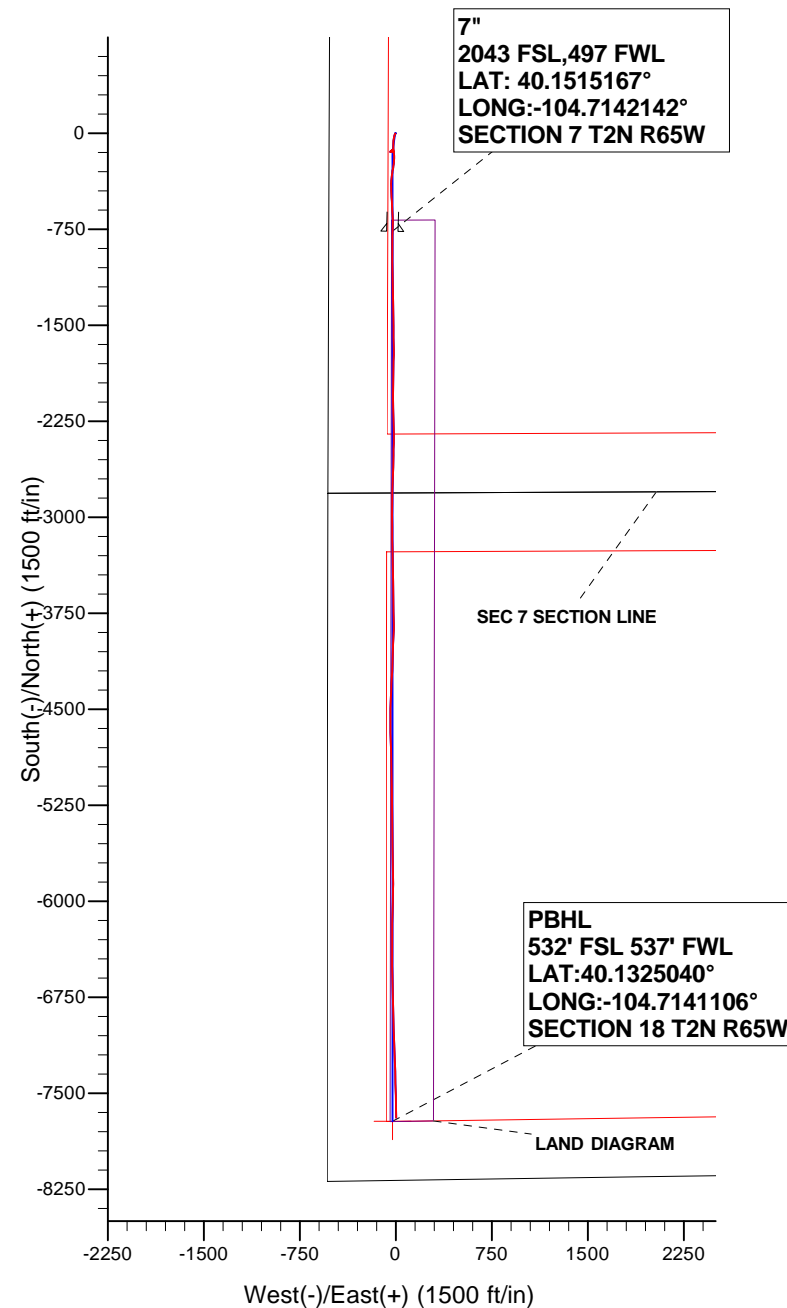
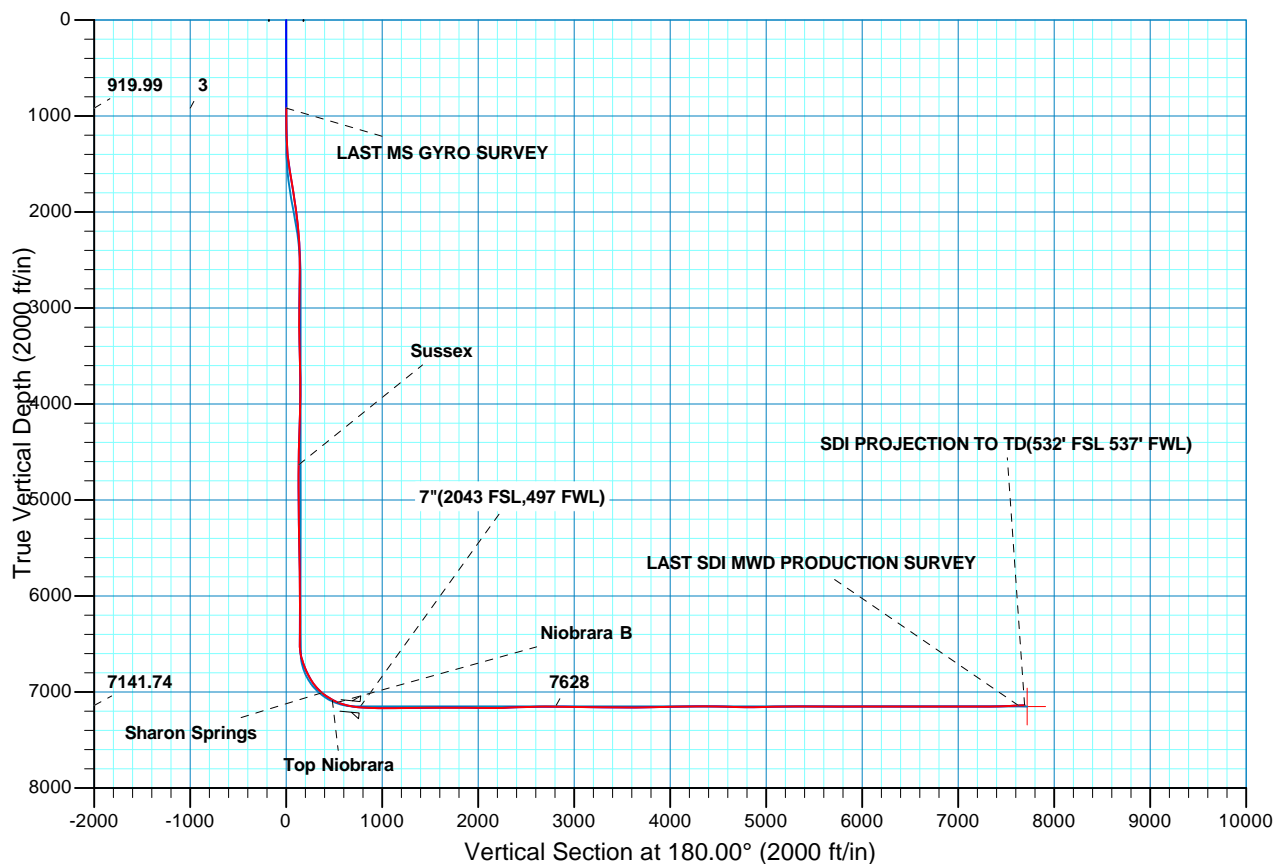
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WELL DETAILS: THOMSEN 13N-18HZ					
GL 4947' & KB 25' @ 4972.00ft (HP 311)					
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	1299781.19	3219667.72	40.1536219	-104.7141220





**Scientific Drilling**

## **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**THOMSEN 5-7 PAD**

**THOMSEN 13N-18HZ**

**OH**

**Design: OH**

## **Standard Survey Report**

**16 May, 2013**

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well THOMSEN 13N-18HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4947' & KB 25' @ 4972.00ft (HP 311)
<b>Site:</b>	THOMSEN 5-7 PAD	<b>MD Reference:</b>	GL 4947' & KB 25' @ 4972.00ft (HP 311)
<b>Well:</b>	THOMSEN 13N-18HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	EDM5000-RobertS-Local

<b>Project</b>	COLORADO NORTHERN ZONE - 83, KERR MCGEE OIL & GAS ONSHORE LP		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

Site		THOMSEN 5-7 PAD, SECTION 7 T2N R65W			
Site Position:		Northing:	1,299,781.83 usft	Latitude:	40.1536230
From:	Lat/Long	Easting:	3,219,697.62 usft	Longitude:	-104.7140150
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.51 °

Well	THOMSEN 13N-18HZ, 2397' FNL 490' FWL					
Well Position	+N/-S	0.00 ft	Northing:	1,299,781.18 usft	Latitude:	40.1536220
	+E/-W	0.00 ft	Easting:	3,219,667.72 usft	Longitude:	-104.7141220
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	4,947.00 ft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	BGGM2012	2013/03/06	8.64	66.78	52,732

<b>Design</b>	OH				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	180.00	

<b>Survey Program</b>	<b>Date</b>	2013/05/16			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
25.00	920.00	Survey #1 MS GYRO (OH)	NS-GYRO-MS	North sensing gyrocompassing m/s	
1,136.00	14,444.00	Survey #2 MWD PRODUCTION (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
25.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	
125.00	0.21	192.24	125.00	-0.18	-0.04	0.18	0.21	0.21	0.00	
<b>FIRST MS GYRO SURVEY</b>										
225.00	0.15	225.99	225.00	-0.45	-0.17	0.45	0.12	-0.06	33.75	
325.00	0.41	215.57	325.00	-0.83	-0.47	0.83	0.26	0.26	-10.42	
425.00	0.05	255.06	425.00	-1.13	-0.72	1.13	0.37	-0.36	39.49	
525.00	0.29	201.01	525.00	-1.38	-0.86	1.38	0.26	0.24	-54.05	
625.00	0.31	246.80	625.00	-1.72	-1.20	1.72	0.23	0.02	45.79	
725.00	0.22	212.00	724.99	-1.99	-1.55	1.99	0.18	-0.09	-34.80	

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well THOMSEN 13N-18HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4947' & KB 25' @ 4972.00ft (HP 311)
<b>Site:</b>	THOMSEN 5-7 PAD	<b>MD Reference:</b>	GL 4947' & KB 25' @ 4972.00ft (HP 311)
<b>Well:</b>	THOMSEN 13N-18HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	EDM5000-RobertS-Local

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)
825.00	0.45	239.14	824.99	-2.36	-1.99	2.36	0.27	0.23	27.14
920.00	0.27	275.49	919.99	-2.53	-2.53	2.53	0.30	-0.19	38.26
<b>LAST MS GYRO SURVEY</b>									
1,136.00	0.87	214.47	1,135.98	-3.83	-3.96	3.83	0.36	0.28	-28.25
<b>FIRST SDI MWD PRODUCTION SURVEY</b>									
1,321.00	3.57	204.73	1,320.82	-10.22	-7.17	10.22	1.47	1.46	-5.26
1,505.00	8.03	193.17	1,503.84	-27.95	-12.50	27.95	2.49	2.42	-6.28
1,688.00	10.10	186.50	1,684.55	-56.34	-17.23	56.34	1.27	1.13	-3.64
1,871.00	8.56	178.44	1,865.13	-85.90	-18.67	85.90	1.10	-0.84	-4.40
2,054.00	7.05	179.94	2,046.43	-110.75	-18.29	110.75	0.83	-0.83	0.82
2,238.00	4.91	168.03	2,229.43	-129.74	-16.64	129.74	1.34	-1.16	-6.47
2,423.00	1.80	180.29	2,414.09	-140.40	-15.02	140.40	1.72	-1.68	6.63
2,607.00	1.57	296.50	2,598.05	-142.16	-17.29	142.16	1.56	-0.13	63.16
2,982.00	1.94	287.89	2,972.87	-137.92	-27.92	137.92	0.12	0.10	-2.30
3,361.00	1.71	231.26	3,351.71	-139.49	-38.44	139.49	0.46	-0.06	-14.94
3,739.00	1.07	200.36	3,729.60	-146.33	-44.07	146.33	0.25	-0.17	-8.17
3,928.00	1.40	80.41	3,918.58	-147.60	-42.41	147.60	1.13	0.17	-63.47
4,117.00	2.76	59.87	4,107.45	-144.93	-36.19	144.93	0.81	0.72	-10.87
4,496.00	1.97	9.09	4,486.16	-133.91	-27.27	133.91	0.57	-0.21	-13.40
4,644.88	0.73	341.28	4,635.00	-130.49	-27.17	130.49	0.92	-0.83	-18.68
<b>Sussex</b>									
4,685.00	0.52	312.83	4,675.12	-130.12	-27.39	130.12	0.92	-0.52	-70.90
4,874.00	0.94	55.26	4,864.11	-128.66	-26.74	128.66	0.62	0.22	54.20
5,063.00	1.48	190.39	5,053.09	-130.17	-25.91	130.17	1.19	0.29	71.50
5,252.00	1.07	236.37	5,242.05	-133.55	-27.82	133.55	0.56	-0.22	24.33
5,347.00	1.47	190.21	5,337.02	-135.24	-28.77	135.24	1.12	0.42	-48.59
5,757.00	1.01	152.98	5,746.93	-143.64	-28.06	143.64	0.22	-0.11	-9.08
6,103.00	0.84	38.80	6,092.91	-144.38	-25.09	144.38	0.45	-0.05	-33.00
6,477.00	1.11	105.65	6,466.87	-143.22	-19.88	143.22	0.29	0.07	17.87
6,519.00	1.40	106.00	6,508.86	-143.47	-19.00	143.47	0.69	0.69	0.83
6,568.00	4.00	160.10	6,557.80	-145.24	-17.84	145.24	6.89	5.31	110.41
6,614.00	10.82	166.62	6,603.39	-150.96	-16.29	150.96	14.91	14.83	14.17
6,663.00	15.84	173.81	6,651.06	-162.09	-14.51	162.09	10.77	10.24	14.67
6,707.00	18.23	176.61	6,693.13	-174.93	-13.45	174.93	5.74	5.43	6.36
6,756.00	21.44	178.99	6,739.22	-191.54	-12.84	191.54	6.75	6.55	4.86
6,803.00	25.38	182.84	6,782.34	-210.20	-13.19	210.20	8.99	8.38	8.19
6,852.00	27.77	186.40	6,826.16	-232.03	-14.98	232.03	5.86	4.88	7.27
6,898.00	30.55	187.49	6,866.33	-254.28	-17.70	254.28	6.15	6.04	2.37
6,924.00	33.25	190.42	6,888.40	-267.84	-19.85	267.84	11.97	10.38	11.27
6,956.00	35.91	191.43	6,914.75	-285.67	-23.30	285.67	8.50	8.31	3.16
6,987.00	38.93	188.26	6,939.37	-304.23	-26.50	304.23	11.55	9.74	-10.23
7,019.00	43.57	187.66	6,963.42	-325.12	-29.42	325.12	14.55	14.50	-1.88
7,050.00	46.33	187.15	6,985.36	-346.84	-32.24	346.84	8.98	8.90	-1.65
7,082.00	49.16	185.58	7,006.87	-370.37	-34.85	370.37	9.56	8.84	-4.91

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<b>Well:</b>	THOMSEN 13N-18HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	EDM5000-RobertS-Local

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)
7,085.27	49.57	185.04	7,009.00	-372.84	-35.08	372.84	17.69	12.54	-16.45
<b>Sharon Springs</b>									
7,113.00	53.14	180.73	7,026.32	-394.46	-36.15	394.46	17.69	12.87	-15.55
7,145.00	56.65	177.64	7,044.72	-420.63	-35.77	420.63	13.52	10.97	-9.66
7,176.00	58.15	176.90	7,061.43	-446.71	-34.52	446.71	5.24	4.84	-2.39
7,208.00	59.86	176.96	7,077.90	-474.10	-33.05	474.10	5.35	5.34	0.19
7,216.26	60.71	177.06	7,082.00	-481.27	-32.68	481.27	10.31	10.26	1.22
<b>Top Niobrara</b>									
7,239.00	63.04	177.33	7,092.72	-501.30	-31.70	501.30	10.31	10.26	1.18
7,271.00	67.37	177.58	7,106.13	-530.31	-30.41	530.31	13.55	13.53	0.78
7,275.89	67.75	177.60	7,108.00	-534.83	-30.22	534.83	7.78	7.77	0.39
<b>Niobrara B</b>									
7,302.00	69.78	177.70	7,117.46	-559.14	-29.22	559.14	7.78	7.77	0.39
7,334.00	72.53	176.55	7,127.79	-589.39	-27.70	589.39	9.24	8.59	-3.59
7,365.00	75.81	176.90	7,136.25	-619.16	-26.00	619.16	10.64	10.58	1.13
7,397.00	78.05	177.38	7,143.48	-650.29	-24.44	650.29	7.15	7.00	1.50
7,428.00	80.00	179.09	7,149.39	-680.70	-23.51	680.70	8.30	6.29	5.52
7,460.00	82.19	181.99	7,154.34	-712.31	-23.81	712.31	11.27	6.84	9.06
7,474.00	82.97	182.48	7,156.15	-726.18	-24.35	726.18	6.56	5.57	3.50
7,515.00	84.60	181.53	7,160.59	-766.92	-25.77	766.92	4.61	3.98	-2.33
<b>7"(2043 FSL, 497 FWL)</b>									
7,610.00	88.39	179.33	7,166.39	-861.71	-26.47	861.71	4.61	3.99	-2.31
7,702.00	89.53	179.99	7,168.06	-953.69	-25.93	953.69	1.43	1.24	0.72
7,793.00	89.93	179.13	7,168.49	-1,044.69	-25.23	1,044.69	1.04	0.44	-0.95
7,885.00	90.30	179.54	7,168.31	-1,136.68	-24.16	1,136.68	0.60	0.40	0.45
7,977.00	90.37	179.45	7,167.77	-1,228.68	-23.35	1,228.68	0.12	0.08	-0.10
8,070.00	90.37	178.13	7,167.17	-1,321.65	-21.39	1,321.65	1.42	0.00	-1.42
8,162.00	90.34	178.51	7,166.60	-1,413.61	-18.69	1,413.61	0.41	-0.03	0.41
8,255.00	90.57	180.00	7,165.86	-1,506.60	-17.48	1,506.60	1.62	0.25	1.60
8,346.00	89.43	179.22	7,165.86	-1,597.59	-16.86	1,597.59	1.52	-1.25	-0.86
8,437.00	90.67	179.63	7,165.78	-1,688.59	-15.95	1,688.59	1.44	1.36	0.45
8,529.00	89.73	181.08	7,165.46	-1,780.58	-16.52	1,780.58	1.88	-1.02	1.58
8,620.00	89.60	181.48	7,165.99	-1,871.56	-18.55	1,871.56	0.46	-0.14	0.44
8,711.00	88.93	181.24	7,167.16	-1,962.52	-20.71	1,962.52	0.78	-0.74	-0.26
8,803.00	90.13	180.30	7,167.91	-2,054.51	-21.95	2,054.51	1.66	1.30	-1.02
8,896.00	90.03	177.06	7,167.78	-2,147.47	-19.81	2,147.47	3.49	-0.11	-3.48
8,988.00	91.68	179.04	7,166.41	-2,239.40	-16.67	2,239.40	2.80	1.79	2.15
9,080.00	91.98	180.24	7,163.47	-2,331.35	-16.10	2,331.35	1.34	0.33	1.30
9,172.00	92.42	180.03	7,159.94	-2,423.28	-16.31	2,423.28	0.53	0.48	-0.23
9,264.00	91.51	181.38	7,156.78	-2,515.22	-17.45	2,515.22	1.77	-0.99	1.47
9,359.00	90.47	181.73	7,155.14	-2,610.17	-20.02	2,610.17	1.16	-1.09	0.37
9,448.00	91.44	181.97	7,153.66	-2,699.11	-22.90	2,699.11	1.12	1.09	0.27
9,542.00	88.79	181.93	7,153.47	-2,793.04	-26.09	2,793.04	2.82	-2.82	-0.04
9,637.00	88.66	180.58	7,155.59	-2,887.99	-28.17	2,887.99	1.43	-0.14	-1.42

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well THOMSEN 13N-18HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4947' & KB 25' @ 4972.00ft (HP 311)
<b>Site:</b>	THOMSEN 5-7 PAD	<b>MD Reference:</b>	GL 4947' & KB 25' @ 4972.00ft (HP 311)
<b>Well:</b>	THOMSEN 13N-18HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	EDM5000-RobertS-Local

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)
9,731.00	89.56	179.88	7,157.05	-2,981.98	-28.55	2,981.98	1.21	0.96	-0.74
9,826.00	89.36	179.85	7,157.94	-3,076.98	-28.33	3,076.98	0.21	-0.21	-0.03
9,920.00	89.70	178.80	7,158.71	-3,170.97	-27.22	3,170.97	1.17	0.36	-1.12
10,015.00	88.86	178.93	7,159.91	-3,265.94	-25.34	3,265.94	0.89	-0.88	0.14
10,110.00	89.73	179.04	7,161.07	-3,360.92	-23.66	3,360.92	0.92	0.92	0.12
10,204.00	89.87	179.09	7,161.40	-3,454.90	-22.12	3,454.90	0.16	0.15	0.05
10,299.00	89.19	178.60	7,162.18	-3,549.88	-20.21	3,549.88	0.88	-0.72	-0.52
10,393.00	90.67	178.87	7,162.30	-3,643.85	-18.13	3,643.85	1.60	1.57	0.29
10,488.00	90.70	179.23	7,161.16	-3,738.83	-16.56	3,738.83	0.38	0.03	0.38
10,582.00	91.07	179.99	7,159.71	-3,832.82	-15.92	3,832.82	0.90	0.39	0.81
10,677.00	91.21	181.88	7,157.82	-3,927.78	-17.47	3,927.78	1.99	0.15	1.99
10,771.00	91.51	182.58	7,155.59	-4,021.69	-21.12	4,021.69	0.81	0.32	0.74
10,866.00	91.85	181.65	7,152.80	-4,116.58	-24.63	4,116.58	1.04	0.36	-0.98
10,961.00	90.43	182.60	7,150.91	-4,211.49	-28.15	4,211.49	1.80	-1.49	1.00
11,055.00	89.23	183.59	7,151.19	-4,305.35	-33.23	4,305.35	1.65	-1.28	1.05
11,150.00	90.13	181.88	7,151.72	-4,400.24	-37.76	4,400.24	2.03	0.95	-1.80
11,244.00	88.29	181.93	7,153.02	-4,494.17	-40.88	4,494.17	1.96	-1.96	0.05
11,339.00	88.39	178.99	7,155.77	-4,589.12	-41.64	4,589.12	3.10	0.11	-3.09
11,433.00	89.23	179.63	7,157.72	-4,683.09	-40.51	4,683.09	1.12	0.89	0.68
11,528.00	88.90	177.97	7,159.27	-4,778.05	-38.52	4,778.05	1.78	-0.35	-1.75
11,622.00	91.38	179.24	7,159.04	-4,872.02	-36.24	4,872.02	2.96	2.64	1.35
11,717.00	91.11	178.31	7,156.98	-4,966.97	-34.20	4,966.97	1.02	-0.28	-0.98
11,812.00	91.78	178.39	7,154.58	-5,061.90	-31.47	5,061.90	0.71	0.71	0.08
11,906.00	91.01	178.62	7,152.30	-5,155.84	-29.02	5,155.84	0.85	-0.82	0.24
12,001.00	89.90	180.03	7,151.54	-5,250.83	-27.90	5,250.83	1.89	-1.17	1.48
12,095.00	89.29	179.91	7,152.21	-5,344.82	-27.85	5,344.82	0.66	-0.65	-0.13
12,190.00	90.03	179.33	7,152.77	-5,439.82	-27.22	5,439.82	0.99	0.78	-0.61
12,284.00	89.90	179.42	7,152.83	-5,533.81	-26.19	5,533.81	0.17	-0.14	0.10
12,379.00	90.13	178.50	7,152.80	-5,628.80	-24.47	5,628.80	1.00	0.24	-0.97
12,473.00	89.97	178.14	7,152.72	-5,722.76	-21.71	5,722.76	0.42	-0.17	-0.38
12,568.00	90.07	180.14	7,152.69	-5,817.74	-20.29	5,817.74	2.11	0.11	2.11
12,663.00	90.24	181.59	7,152.43	-5,912.73	-21.72	5,912.73	1.54	0.18	1.53
12,757.00	89.97	180.63	7,152.26	-6,006.71	-23.54	6,006.71	1.06	-0.29	-1.02
12,852.00	89.90	181.01	7,152.37	-6,101.70	-24.90	6,101.70	0.41	-0.07	0.40
12,946.00	89.90	180.94	7,152.53	-6,195.68	-26.50	6,195.68	0.07	0.00	-0.07
13,041.00	89.93	180.40	7,152.67	-6,290.68	-27.61	6,290.68	0.57	0.03	-0.57
13,135.00	89.83	180.63	7,152.87	-6,384.67	-28.46	6,384.67	0.27	-0.11	0.24
13,230.00	89.80	180.00	7,153.17	-6,479.67	-28.98	6,479.67	0.66	-0.03	-0.66
13,324.00	89.56	179.56	7,153.70	-6,573.67	-28.62	6,573.67	0.53	-0.26	-0.47
13,419.00	90.47	178.27	7,153.67	-6,668.65	-26.82	6,668.65	1.66	0.96	-1.36
13,513.00	90.03	177.85	7,153.26	-6,762.59	-23.64	6,762.59	0.65	-0.47	-0.45
13,608.00	90.17	178.90	7,153.10	-6,857.55	-20.95	6,857.55	1.12	0.15	1.11
13,702.00	89.97	177.35	7,152.98	-6,951.50	-17.87	6,951.50	1.66	-0.21	-1.65



<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well THOMSEN 13N-18HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4947' & KB 25' @ 4972.00ft (HP 311)
<b>Site:</b>	THOMSEN 5-7 PAD	<b>MD Reference:</b>	GL 4947' & KB 25' @ 4972.00ft (HP 311)
<b>Well:</b>	THOMSEN 13N-18HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	EDM5000-RobertS-Local

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)
13,797.00	89.43	177.94	7,153.48	-7,046.42	-13.97	7,046.42	0.84	-0.57	0.62
13,891.00	89.87	177.48	7,154.05	-7,140.34	-10.21	7,140.34	0.68	0.47	-0.49
13,986.00	90.67	178.30	7,153.61	-7,235.27	-6.71	7,235.27	1.21	0.84	0.86
14,080.00	90.94	178.69	7,152.29	-7,329.23	-4.24	7,329.23	0.50	0.29	0.41
14,175.00	91.78	178.37	7,150.03	-7,424.17	-1.81	7,424.17	0.95	0.88	-0.34
14,269.00	92.32	178.88	7,146.67	-7,518.08	0.45	7,518.08	0.79	0.57	0.54
14,379.00	92.82	179.21	7,141.74	-7,627.96	2.28	7,627.96	0.54	0.45	0.30
<b>LAST SDI MWD PRODUCTION SURVEY</b>									
14,444.00	92.82	179.21	7,138.54	-7,692.87	3.17	7,692.87	0.00	0.00	0.00
<b>SDI PROJECTION TO TD(532' FSL 537' FWL) - PBHL_THOMSEN 13N-18HZ(460' FSL 480' FWL)</b>									

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
7,515.00	7,160.59	7"(2043 FSL,497 FWL)	7.000	7.500

Formations				
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°) / Dip Direction (°)
4,644.88	4,635.00	Sussex		
7,085.27	7,009.00	Sharon Springs		
7,216.26	7,082.00	Top Niobrara		
7,275.89	7,108.00	Niobrara B		

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
125.00	125.00	-0.18	-0.04	FIRST MS GYRO SURVEY
920.00	919.99	-2.53	-2.53	LAST MS GYRO SURVEY
1,136.00	1,135.98	-3.83	-3.96	FIRST SDI MWD PRODUCTION SURVEY
14,379.00	7,141.74	-7,627.96	2.28	LAST SDI MWD PRODUCTION SURVEY
14,444.00	7,138.54	-7,692.87	3.17	SDI PROJECTION TO TD(532' FSL 537' FWL)

Checked By: _____	Approved By: _____	Date: _____
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