

Chevron USA

Piceance

SKR-698-04-AV

SKR-698-04-AV-11 - Slot 11

698-4-9

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

03 March, 2009

Well Coordinates (NAD83): 1,641,078.27 N, 2,199,847.32 E (39° 33' 33.22" N, 108° 20' 18.30" W)

Ground Level: 5,959.00 ft

Local Coordinate Origin:	Centered on Well SKR-698-04-AV-11 (Slot 11) - Slot
Viewing Datum:	RFE @ 5984.0ft (RFE)
TVDs to System:	N
North Reference:	Grid
Unit System:	API - US Survey Feet

Version: 2003.16 Build: 431

HALLIBURTON

Project: Piceance
Site: SKR-698-04-AV
Well: SKR-698-04-AV-11
Wellbore: 698-4-9
Plan: Actual Field Surveys

Chevron USA

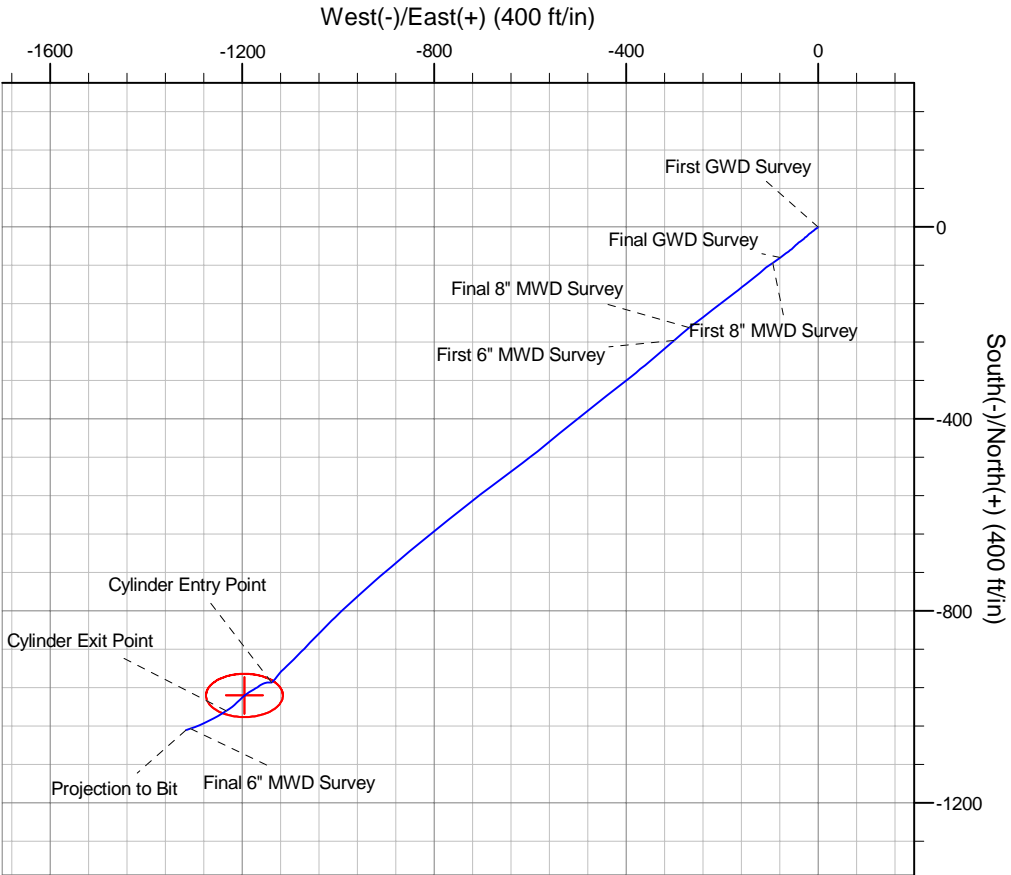
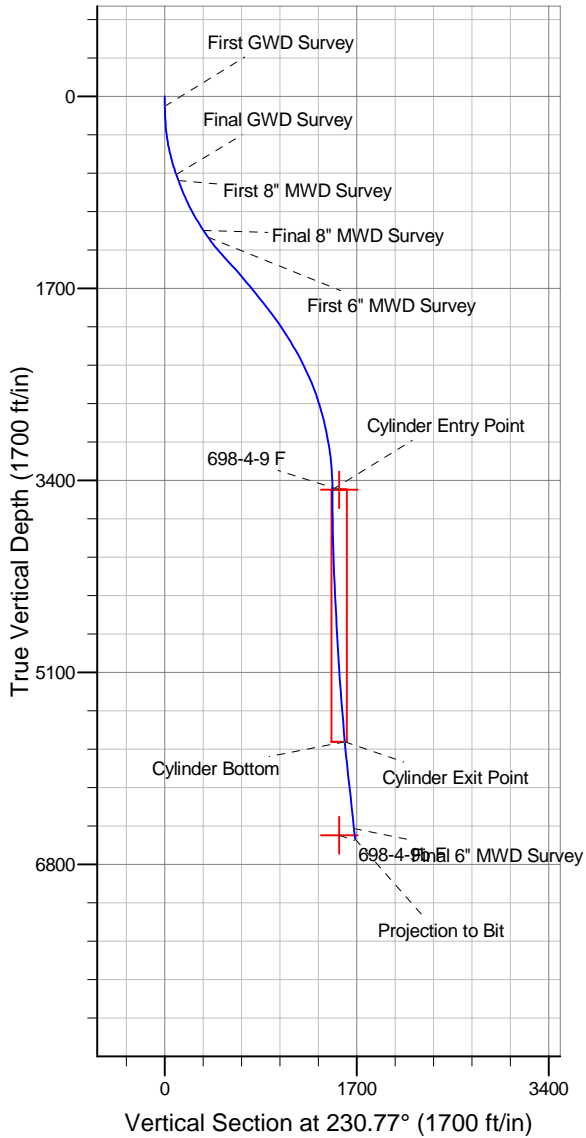


WELL DETAILS: SKR-698-04-AV-11

+N/-S	+E/-W	Northing	Ground Level: 5959.0	Easting	Latitude	Longitude	Slot
0.0	0.0	1641078.27		2199847.32	39° 33' 33.221 N	108° 20' 18.299 W	Slot 11

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
698-4-9 F	3483.0	-975.8	-1195.0	1640102.48	2198652.35	Ellipse (Radii: L45.0 W80.0)
698-4-9b F	6541.0	-975.8	-1195.0	1640102.48	2198652.35	Point



Design Report for SKR-698-04-AV-11 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00
89.0	0.09	113.63	89.0	0.0	0.1	0.0	0.10
First GWD Survey							
120.0	0.79	210.89	120.0	-0.2	0.0	0.2	2.60
151.0	1.85	220.76	151.0	-0.8	-0.5	0.9	3.48
181.0	2.56	233.27	181.0	-1.6	-1.3	2.0	2.85
212.0	3.52	242.61	211.9	-2.4	-2.7	3.6	3.47
243.0	4.14	231.34	242.9	-3.5	-4.4	5.7	3.14
274.0	4.93	232.57	273.8	-5.0	-6.4	8.1	2.57
304.0	6.08	230.63	303.6	-6.8	-8.6	11.0	3.88
335.0	7.31	230.63	334.4	-9.1	-11.4	14.6	3.97
366.0	8.28	233.98	365.1	-11.7	-14.7	18.8	3.45
396.0	9.34	226.93	394.8	-14.6	-18.3	23.4	5.04
427.0	10.66	230.98	425.3	-18.2	-22.3	28.8	4.82
458.0	11.63	229.57	455.7	-22.0	-26.9	34.8	3.25
489.0	12.60	231.69	486.0	-26.1	-32.0	41.3	3.44
519.0	13.66	234.15	515.2	-30.2	-37.4	48.1	3.99
550.0	14.63	229.40	545.3	-34.9	-43.3	55.7	4.88
581.0	15.68	225.70	575.2	-40.4	-49.3	63.7	4.60
612.0	16.74	227.28	605.0	-46.3	-55.6	72.4	3.70
658.0	18.24	236.80	648.9	-54.8	-66.5	86.1	7.01
704.0	19.47	233.45	692.4	-63.3	-78.7	101.0	3.56
Final GWD Survey							
762.0	20.36	234.45	746.9	-74.9	-94.6	120.7	1.64
First 8" MWD Survey							
856.0	21.74	231.12	834.7	-95.3	-121.5	154.4	1.94
951.0	24.53	230.86	922.0	-118.8	-150.5	191.7	2.94
1,045.0	27.94	232.52	1,006.3	-144.6	-183.1	233.3	3.71
1,139.0	30.64	232.68	1,088.3	-172.5	-219.7	279.2	2.87
1,186.0	31.76	232.48	1,128.5	-187.3	-239.0	303.6	2.39
1,254.0	33.96	231.76	1,185.6	-209.9	-268.1	340.4	3.29
Final 8" MWD Survey							
1,327.0	34.79	229.17	1,245.9	-236.2	-299.9	381.7	2.30
First 6" MWD Survey							
1,422.0	38.13	229.37	1,322.3	-273.0	-342.7	438.1	3.52
1,516.0	41.91	231.46	1,394.2	-311.5	-389.3	498.5	4.27
1,611.0	43.10	232.10	1,464.3	-351.2	-439.7	562.7	1.33
1,705.0	41.59	231.50	1,533.7	-390.3	-489.4	626.0	1.66
1,800.0	40.42	230.94	1,605.4	-429.4	-538.0	688.3	1.29
1,894.0	39.03	230.79	1,677.7	-467.3	-584.6	748.4	1.48
1,988.0	39.80	233.80	1,750.4	-503.8	-631.9	808.0	2.19
2,083.0	38.47	233.02	1,824.0	-539.5	-680.0	867.9	1.49
2,177.0	37.19	231.77	1,898.3	-574.7	-725.7	925.6	1.59
2,271.0	36.03	231.47	1,973.7	-609.5	-769.6	981.6	1.25
2,366.0	33.40	230.63	2,051.8	-643.5	-811.7	1,035.7	2.81
2,460.0	32.21	230.16	2,130.8	-675.9	-850.9	1,086.6	1.29
2,554.0	30.61	230.07	2,211.1	-707.3	-888.5	1,135.6	1.70
2,649.0	27.99	228.40	2,293.9	-737.7	-923.7	1,182.1	2.89
2,743.0	26.23	227.53	2,377.6	-766.4	-955.6	1,224.9	1.92
2,837.0	24.98	227.84	2,462.3	-793.7	-985.6	1,265.4	1.34

Design Report for SKR-698-04-AV-11 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
2,932.0	21.82	225.15	2,549.5	-819.6	-1,013.0	1,303.0	3.51
3,026.0	20.29	224.37	2,637.2	-843.6	-1,036.8	1,336.6	1.65
3,121.0	17.30	223.54	2,727.2	-865.6	-1,058.0	1,367.0	3.16
3,215.0	15.03	225.28	2,817.4	-884.3	-1,076.3	1,393.0	2.47
3,310.0	12.85	225.08	2,909.6	-900.5	-1,092.6	1,415.8	2.30
3,404.0	11.12	226.06	3,001.6	-914.1	-1,106.5	1,435.2	1.85
3,498.0	9.26	222.72	3,094.1	-926.0	-1,118.2	1,451.8	2.08
3,593.0	7.01	218.34	3,188.1	-936.1	-1,126.9	1,465.0	2.45
3,687.0	4.43	221.35	3,281.7	-943.4	-1,132.9	1,474.2	2.76
3,781.0	2.20	233.24	3,375.5	-947.2	-1,136.7	1,479.6	2.47
3,875.0	0.24	211.52	3,469.5	-948.4	-1,138.3	1,481.5	2.11
3,888.5	0.27	235.46	3,483.0	-948.5	-1,138.3	1,481.6	0.82
Cylinder Entry Point							
3,889.1	0.28	236.25	3,483.5	-948.5	-1,138.3	1,481.6	0.82
698-4-9 F							
3,970.0	0.84	279.74	3,564.5	-948.5	-1,139.1	1,482.2	0.82
4,064.0	1.22	266.34	3,658.4	-948.4	-1,140.8	1,483.5	0.48
4,158.0	1.35	262.65	3,752.4	-948.6	-1,142.9	1,485.2	0.16
4,253.0	1.43	265.05	3,847.4	-948.9	-1,145.1	1,487.1	0.10
4,347.0	1.54	267.38	3,941.4	-949.0	-1,147.6	1,489.1	0.13
4,441.0	1.55	257.85	4,035.3	-949.4	-1,150.1	1,491.3	0.27
4,536.0	2.05	254.89	4,130.3	-950.1	-1,153.0	1,494.0	0.54
4,630.0	2.41	245.50	4,224.2	-951.3	-1,156.4	1,497.4	0.54
4,724.0	2.61	237.94	4,318.1	-953.3	-1,160.0	1,501.4	0.41
4,818.0	2.90	233.86	4,412.0	-955.8	-1,163.7	1,505.9	0.37
4,913.0	2.83	235.91	4,506.9	-958.5	-1,167.6	1,510.7	0.13
5,007.0	2.83	241.60	4,600.8	-961.0	-1,171.6	1,515.3	0.30
5,102.0	3.14	241.02	4,695.7	-963.3	-1,175.9	1,520.1	0.33
5,196.0	3.38	237.26	4,789.5	-966.1	-1,180.5	1,525.4	0.34
5,290.0	3.12	236.42	4,883.4	-969.0	-1,185.0	1,530.7	0.28
5,385.0	3.45	234.19	4,978.2	-972.1	-1,189.4	1,536.1	0.37
5,479.0	3.63	231.49	5,072.0	-975.6	-1,194.1	1,541.9	0.26
5,574.0	4.20	228.01	5,166.8	-979.8	-1,199.0	1,548.4	0.65
5,668.0	4.80	228.02	5,260.5	-984.7	-1,204.5	1,555.8	0.64
5,762.0	4.74	225.52	5,354.2	-990.1	-1,210.2	1,563.6	0.23
5,857.0	4.19	226.39	5,448.9	-995.2	-1,215.5	1,571.0	0.58
5,951.0	4.32	230.91	5,542.6	-999.8	-1,220.7	1,577.9	0.38
6,046.0	4.95	235.77	5,637.3	-1,004.4	-1,226.9	1,585.6	0.78
6,124.0	5.35	239.15	5,715.0	-1,008.1	-1,232.8	1,592.5	0.64
Cylinder Bottom - Cylinder Exit Point							
6,140.0	5.43	239.78	5,730.9	-1,008.9	-1,234.1	1,594.0	0.64
6,234.0	5.71	238.54	5,824.5	-1,013.6	-1,241.9	1,603.0	0.32
6,329.0	6.07	240.05	5,919.0	-1,018.6	-1,250.3	1,612.7	0.41
6,423.0	6.21	242.15	6,012.4	-1,023.4	-1,259.1	1,622.6	0.28
6,612.0	6.55	244.38	6,200.3	-1,032.9	-1,277.9	1,643.1	0.22
6,706.0	6.73	246.90	6,293.6	-1,037.3	-1,287.8	1,653.6	0.36
6,801.0	6.64	248.06	6,388.0	-1,041.6	-1,298.0	1,664.2	0.17
6,895.0	6.02	252.11	6,481.4	-1,045.1	-1,307.7	1,673.9	0.81
Final 6" MWD Survey - 698-4-9b F							
6,990.0	6.02	252.11	6,575.9	-1,048.2	-1,317.2	1,683.2	0.00
Projection to Bit							

Design Report for SKR-698-04-AV-11 - Actual Field Surveys**Design Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
89.0	89.0	0.0	0.1	First GWD Survey
704.0	692.4	-63.3	-78.7	Final GWD Survey
762.0	746.9	-74.9	-94.6	First 8" MWD Survey
1,254.0	1,185.6	-209.9	-268.1	Final 8" MWD Survey
1,327.0	1,245.9	-236.2	-299.9	First 6" MWD Survey
3,888.5	3,483.0	-948.5	-1,138.3	Cylinder Entry Point
6,124.0	5,715.0	-1,008.1	-1,232.8	Cylinder Bottom
6,124.0	5,715.0	-1,008.1	-1,232.8	Cylinder Exit Point
6,895.0	6,481.4	-1,045.1	-1,307.7	Final 6" MWD Survey
6,990.0	6,575.9	-1,048.2	-1,317.2	Projection to Bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/_S (ft)	+E/-W (ft)	
Target	698-4-9 F	230.77	Slot	0.0	0.0	0.0

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
89.0	704.0	GWD Surveys	GYD_GWD_SS
762.0	1,254.0	8" MWD Surveys	MWD
1,327.0	6,990.0	6" MWD Surveys	MWD

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
698-4-9 F	0.00	360.00	3,483.0	-975.8	-1,195.0	1,640,102.48	2,198,652.35	39° 33' 23.212 N	108° 20' 33.160 W
- actual wellpath misses target center by 62.9ft at 3888.8ft MD (3483.3 TVD, -948.5 N, -1138.3 E)									
- Ellipse (radii L45.0 W80.0 on 360.00 azi) - Target Cylinder 100% Intersected									
698-4-9b F	0.00	360.00	6,541.0	-975.8	-1,195.0	1,640,102.48	2,198,652.35	39° 33' 23.212 N	108° 20' 33.160 W
- actual wellpath misses target center by 145.1ft at 6895.0ft MD (6481.4 TVD, -1045.1 N, -1307.7 E)									
- Point									