

# Chevron USA

Piceance

SKR-698-09-AV

SKR-698-09-AV-15 - Slot 15

698-9-59

Design: Actual Field Surveys

## Sperry Drilling Services

### Standard Report

10 April, 2009

Well Coordinates (NAD83): 1,638,038.80 N, 2,202,176.17 E (39° 33' 03.91" N, 108° 19' 47.37" W)

Ground Level: 5,921.90 ft

Local Coordinate Origin: Centered on Well SKR-698-09-AV-15 (Slot 15) - Slot

Viewing Datum: RFE @ 5946.9ft (Original Well Elev)

TVDs to System: N

North Reference: Grid

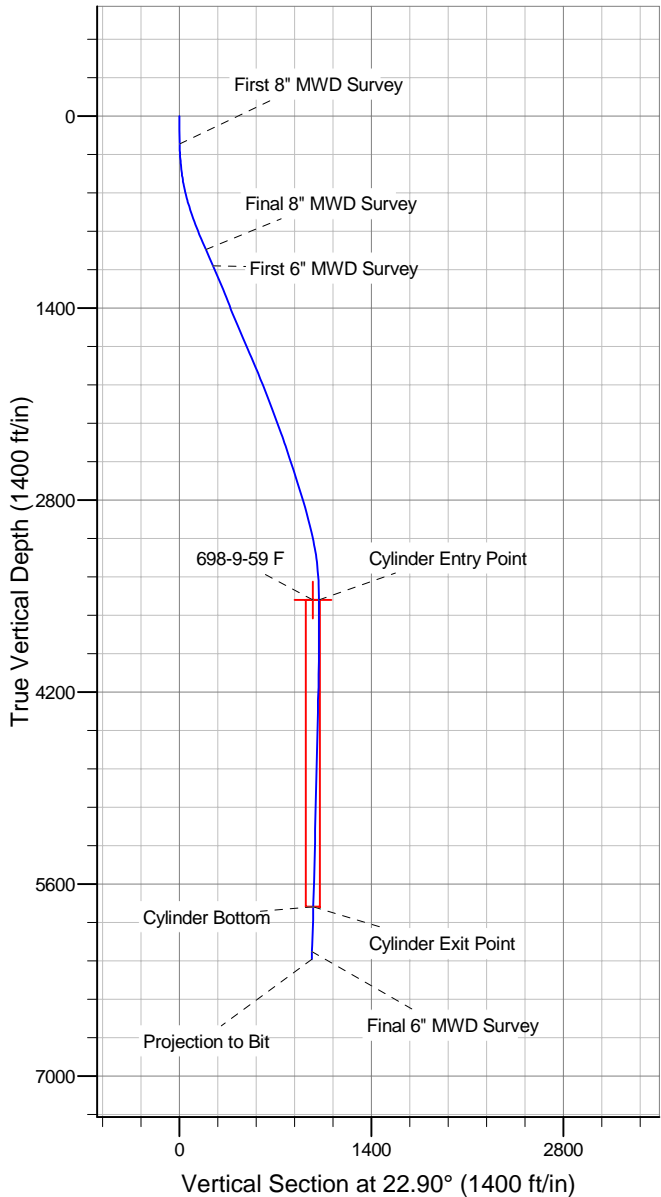
Unit System: API - US Survey Feet

Version: 2003.16 Build: 431

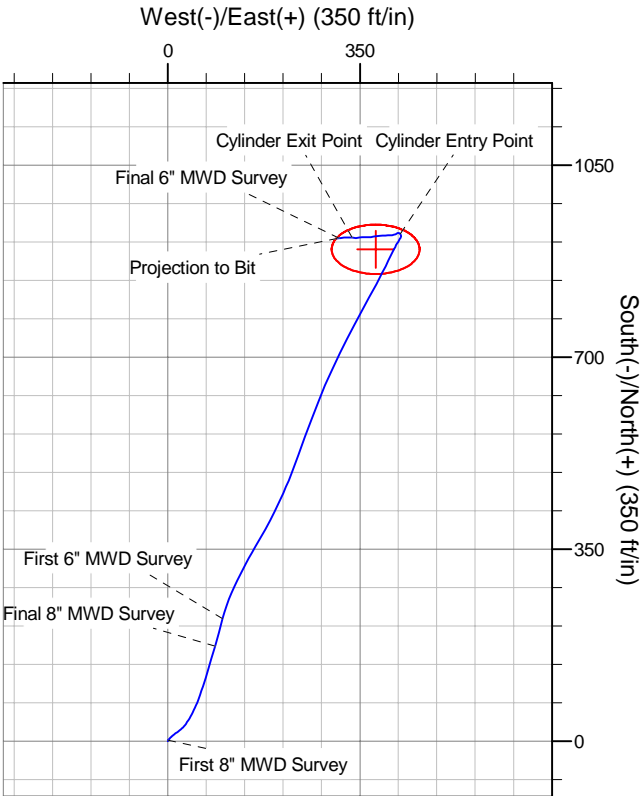
**HALLIBURTON**

Project: Piceance  
 Site: SKR-698-09-AV  
 Well: SKR-698-09-AV-15  
 Wellbore: 698-9-59  
 Plan: Actual Field Surveys

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WELL DETAILS: SKR-698-09-AV-15							
+N/-S 0.0	+E/-W 0.0	Northing 1638038.80	Ground Level: 5921.9 Easting 2202176.17	Latitude 39° 33' 3.913 N	Longitude 108° 19' 47.369 W	Slot Slot 15	
WELLBORE TARGET DETAILS (MAP CO-ORDINATES)							
Name 698-9-59 F	TVD 3529.0	+N/-S 896.6	+E/-W 378.7	Northing 1638935.45	Easting 2202554.87	Shape Ellipse (Radii: L45.0 W80.0)	



## Design Report for SKR-698-09-AV-15 - 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
205.0	1.03	20.44	205.0	1.7	0.6	1.8	0.50
<b>First 8" MWD Survey</b>							
236.0	2.05	37.01	236.0	2.4	1.1	2.7	3.56
267.0	3.23	41.96	266.9	3.5	2.0	4.0	3.87
297.0	4.13	41.90	296.9	5.0	3.3	5.8	3.00
328.0	5.16	45.24	327.8	6.8	5.0	8.2	3.43
359.0	6.30	46.59	358.6	8.9	7.2	11.0	3.70
390.0	7.26	51.01	389.4	11.3	10.0	14.3	3.52
420.0	8.58	53.27	419.1	13.9	13.3	17.9	4.52
451.0	9.75	52.24	449.7	16.8	17.2	22.2	3.81
481.0	10.84	52.44	479.2	20.1	21.4	26.9	3.64
512.0	11.88	47.07	509.6	24.1	26.1	32.3	4.78
543.0	13.32	39.47	539.9	29.0	30.7	38.7	7.07
574.0	14.44	34.49	570.0	34.9	35.2	45.9	5.28
604.0	15.35	30.95	599.0	41.4	39.3	53.5	4.29
635.0	16.41	27.72	628.8	48.8	43.5	61.9	4.45
666.0	17.29	25.24	658.5	56.9	47.5	70.9	3.66
697.0	18.28	23.13	688.0	65.5	51.3	80.3	3.81
729.0	19.03	20.90	718.3	75.0	55.2	90.6	3.23
760.0	19.74	19.13	747.5	84.7	58.7	100.8	2.97
807.0	20.77	17.77	791.6	100.1	63.8	117.0	2.41
854.0	21.50	17.16	835.5	116.3	68.9	133.9	1.62
948.0	23.67	16.50	922.3	150.8	79.4	169.8	2.32
1,006.0	24.58	16.31	975.2	173.6	86.1	193.4	1.57
<b>Final 8" MWD Survey</b>							
1,134.0	23.32	14.76	1,092.2	223.6	100.0	244.9	1.10
<b>First 6" MWD Survey</b>							
1,228.0	23.38	21.05	1,178.5	259.0	111.4	282.0	2.65
1,323.0	22.86	26.71	1,265.9	293.1	126.5	319.2	2.40
1,417.0	20.50	27.27	1,353.2	324.0	142.2	353.9	2.52
1,511.0	22.85	30.85	1,440.6	354.3	159.1	388.3	2.87
1,606.0	22.91	29.57	1,528.1	386.3	177.7	425.0	0.53
1,700.0	23.28	25.30	1,614.6	419.0	194.7	461.7	1.82
1,794.0	22.81	25.28	1,701.1	452.2	210.4	498.5	0.50
1,889.0	24.00	19.90	1,788.3	487.1	224.9	536.2	2.57
1,983.0	22.42	20.71	1,874.6	521.8	237.7	573.2	1.71
2,077.0	20.93	19.83	1,962.0	554.4	249.7	607.9	1.62
2,172.0	21.22	21.37	2,050.6	586.3	261.8	642.0	0.66
2,266.0	20.73	21.07	2,138.4	617.7	273.9	675.6	0.53
2,361.0	20.44	23.14	2,227.3	648.7	286.5	709.0	0.82
2,455.0	20.96	25.66	2,315.3	678.9	300.2	742.2	1.10
2,550.0	17.91	25.03	2,404.9	707.5	313.8	773.8	3.22
2,644.0	18.06	28.01	2,494.3	733.4	326.7	802.8	0.99
2,738.0	17.40	26.66	2,583.8	758.8	339.9	831.3	0.83
2,833.0	17.64	29.06	2,674.4	784.1	353.3	859.8	0.80
2,927.0	17.49	28.31	2,764.0	809.0	366.9	888.0	0.29
3,021.0	16.29	27.75	2,854.0	833.1	379.7	915.2	1.29
3,115.0	14.67	28.04	2,944.5	855.3	391.4	940.2	1.73
3,210.0	13.52	26.31	3,036.7	875.9	402.0	963.3	1.29

## Design Report for SKR-698-09-AV-15 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
3,304.0	10.72	25.76	3,128.6	893.6	410.7	983.0	2.98
3,399.0	7.62	30.58	3,222.4	907.0	417.7	998.0	3.36
3,493.0	4.94	31.76	3,315.8	915.8	423.0	1,008.2	2.85
3,588.0	2.30	354.38	3,410.6	921.2	425.0	1,013.9	3.59
3,682.0	1.83	326.82	3,504.5	924.3	424.0	1,016.4	1.15
3,706.5	1.45	324.08	3,529.0	924.9	423.6	1,016.8	1.57
<b>Cylinder Entry Point</b>							
3,706.6	1.45	324.08	3,529.2	924.9	423.6	1,016.8	0.00
<b>698-9-59 F</b>							
3,776.0	0.46	291.37	3,598.5	925.7	422.8	1,017.3	1.58
3,871.0	0.74	303.54	3,693.5	926.2	422.0	1,017.4	0.32
3,965.0	0.67	271.51	3,787.5	926.5	420.9	1,017.3	0.42
4,059.0	0.62	267.34	3,881.5	926.5	419.8	1,016.9	0.07
4,154.0	1.09	256.14	3,976.5	926.3	418.5	1,016.1	0.52
4,248.0	1.25	234.82	4,070.5	925.5	416.7	1,014.7	0.49
4,342.0	1.45	245.12	4,164.4	924.4	414.8	1,012.9	0.33
4,437.0	1.97	247.72	4,259.4	923.2	412.2	1,010.9	0.55
4,531.0	2.19	266.30	4,353.3	922.5	408.9	1,008.9	0.75
4,626.0	2.24	270.36	4,448.3	922.4	405.3	1,007.4	0.17
4,720.0	2.56	260.98	4,542.2	922.1	401.4	1,005.6	0.54
4,814.0	3.06	267.55	4,636.1	921.7	396.8	1,003.4	0.63
4,909.0	3.81	267.63	4,730.9	921.4	391.1	1,001.0	0.79
5,003.0	3.79	263.81	4,824.7	921.0	384.9	998.1	0.27
5,097.0	2.97	262.98	4,918.5	920.3	379.4	995.4	0.87
5,191.0	2.80	260.61	5,012.4	919.6	374.7	993.0	0.22
5,286.0	2.39	262.58	5,107.3	919.0	370.4	990.7	0.44
5,380.0	2.33	275.56	5,201.2	918.9	366.6	989.2	0.57
5,475.0	2.27	268.85	5,296.2	919.1	362.8	987.8	0.29
5,569.0	2.73	269.37	5,390.1	919.0	358.7	986.2	0.49
5,663.0	2.96	265.78	5,483.9	918.8	354.0	984.2	0.31
5,758.0	3.55	258.25	5,578.8	918.0	348.7	981.4	0.77
5,945.7	4.43	277.70	5,766.0	917.8	335.8	976.2	0.85
<b>Cylinder Bottom - Cylinder Exit Point</b>							
5,947.0	4.44	277.81	5,767.3	917.9	335.7	976.2	0.85
6,041.0	4.64	269.60	5,861.1	918.3	328.3	973.7	0.72
6,229.0	3.79	262.38	6,048.5	917.4	314.6	967.5	0.53
6,272.0	3.53	262.07	6,091.5	917.1	311.8	966.1	0.61
<b>Final 6" MWD Survey</b>							
6,330.0	3.53	262.07	6,149.3	916.6	308.3	964.3	0.00
<b>Projection to Bit</b>							

**Design Report for SKR-698-09-AV-15 - Actual Field Surveys****Design Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
205.0	205.0	1.7	0.6	First 8" MWD Survey
1,006.0	975.2	173.6	86.1	Final 8" MWD Survey
1,134.0	1,092.2	223.6	100.0	First 6" MWD Survey
3,706.5	3,529.0	924.9	423.6	Cylinder Entry Point
5,945.7	5,766.0	917.8	335.8	Cylinder Bottom
5,945.7	5,766.0	917.8	335.8	Cylinder Exit Point
6,272.0	6,091.5	917.1	311.8	Final 6" MWD Survey
6,330.0	6,149.3	916.6	308.3	Projection to Bit

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/_S (ft)	+E/-W (ft)	
Target	698-9-59 F	22.90	Slot	0.0	0.0	0.0

**Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
205.0	1,006.0	8" MWD Surveys	MWD
1,134.0	6,330.0	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
698-9-59 F	0.00	0.00	3,529.0	896.6	378.7	1,638,935.45	2,202,554.87	39° 33' 12.887 N	108° 19' 42.893 W
- actual wellpath misses target center by 53.0ft at 3706.6ft MD (3529.1 TVD, 924.9 N, 423.6 E)									
- Ellipse (radii L45.0 W80.0 on 0.00 azi) - Target Cylinder 100% Intersected									