

# Chevron USA

Piceance

SKR-698-04-AV

SKR-698-04-AV-12 - Slot 12

698-4-14

Design: Actual Field Surveys

## Sperry Drilling Services

### Standard Report

03 March, 2009

Well Coordinates (NAD83): 1,641,086.48 N, 2,199,853.02 E (39° 33' 33.30" N, 108° 20' 18.23" W)

Ground Level: 5,959.00 ft

Local Coordinate Origin:	Centered on Well SKR-698-04-AV-12 (Slot 12) - 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-12  
Wellbore: 698-4-14  
Plan: Actual Field Surveys

Chevron USA

HALLIBURTON

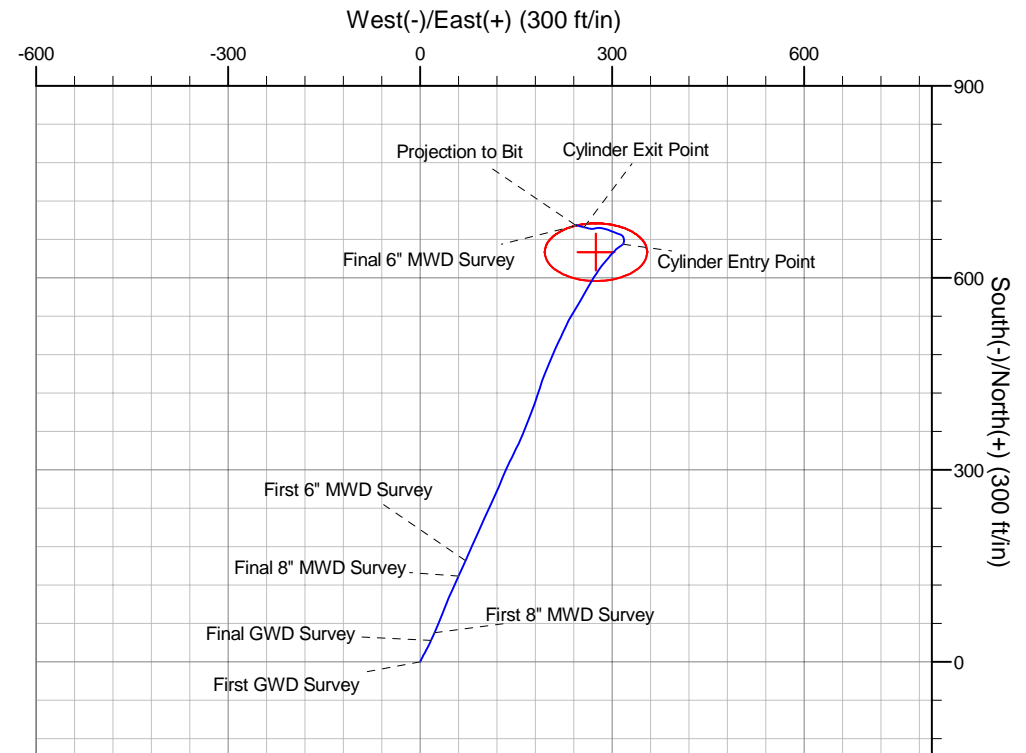
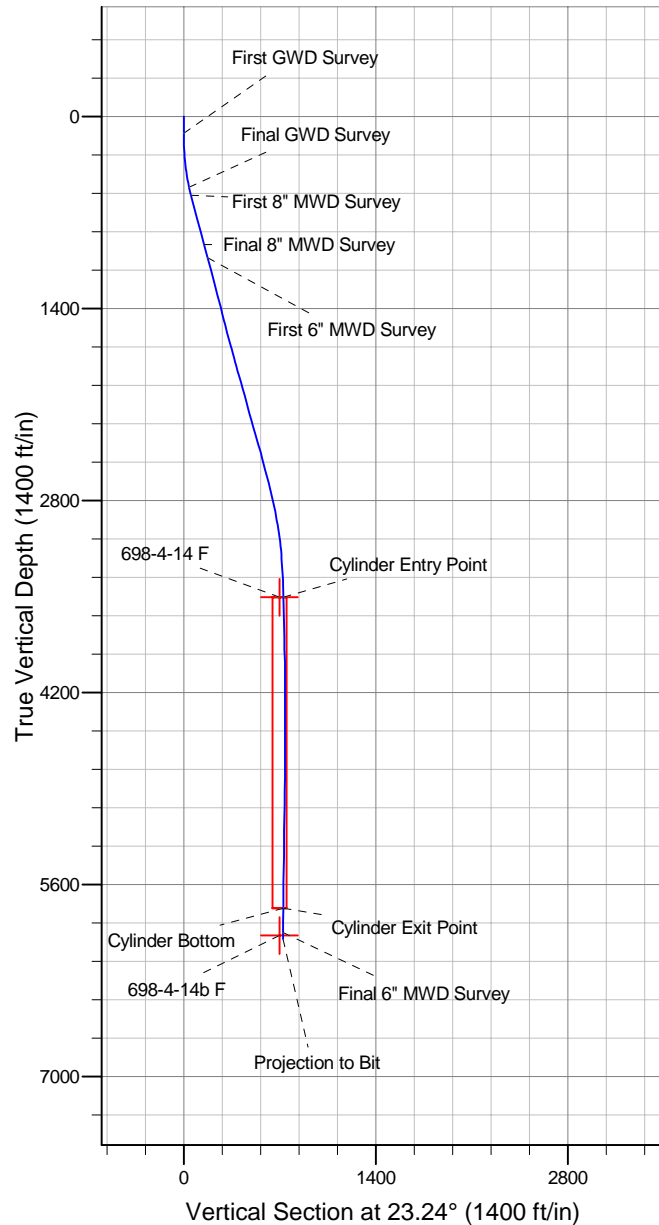
Drilling and Formation  
Evaluation

WELL DETAILS: SKR-698-04-AV-12

			Ground Level: 5959.0				
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot	
0.0	0.0	1641086.48	2199853.02	39° 33' 33.304 N	108° 20' 18.230 W	Slot 12	

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
698-4-14 F	3506.0	640.3	275.0	1641726.80	2200128.00	Ellipse (Radii: L45.0 W80.0)
698-4-14b F	5971.0	640.3	275.0	1641726.80	2200128.00	Point



## Design Report for SKR-698-04-AV-12 - 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
120.0	0.26	36.62	120.0	0.2	0.2	0.3	0.22
<b>First GWD Survey</b>							
181.0	0.97	29.57	181.0	0.8	0.5	0.9	1.17
243.0	2.47	22.70	243.0	2.5	1.3	2.8	2.44
335.0	5.81	29.75	334.7	8.3	4.4	9.4	3.67
427.0	9.16	27.63	425.9	18.9	10.1	21.3	3.65
519.0	11.72	23.58	516.4	33.9	17.2	38.0	2.89
<b>Final GWD Survey</b>							
578.0	14.22	24.30	573.9	46.0	22.6	51.2	4.25
<b>First 8" MWD Survey</b>							
670.0	15.26	22.99	662.8	67.5	32.0	74.6	1.19
762.0	15.07	20.48	751.6	89.8	40.9	98.7	0.74
856.0	14.84	25.33	842.5	112.2	50.3	122.9	1.35
951.0	15.03	24.36	934.3	134.4	60.6	147.4	0.33
<b>Final 8" MWD Survey</b>							
1,050.0	15.83	23.99	1,029.7	158.4	71.4	173.7	0.81
<b>First 6" MWD Survey</b>							
1,144.0	15.11	23.58	1,120.3	181.3	81.5	198.8	0.77
1,238.0	14.37	22.85	1,211.2	203.3	90.9	222.7	0.81
1,333.0	14.52	26.26	1,303.2	224.9	100.8	246.4	0.91
1,427.0	14.74	24.53	1,394.1	246.3	110.9	270.1	0.52
1,521.0	13.41	24.57	1,485.3	267.1	120.4	293.0	1.41
1,616.0	15.39	21.23	1,577.3	288.9	129.6	316.6	2.26
1,710.0	16.07	25.59	1,667.8	312.2	139.7	342.0	1.45
1,804.0	14.09	27.14	1,758.6	334.2	150.6	366.4	2.15
1,899.0	15.58	21.76	1,850.4	356.3	160.6	390.7	2.13
1,993.0	16.83	21.76	1,940.7	380.7	170.3	417.0	1.33
2,087.0	15.35	19.80	2,031.0	405.0	179.5	443.0	1.68
2,182.0	14.30	16.94	2,122.8	428.1	187.2	467.2	1.35
2,276.0	15.57	22.24	2,213.6	450.8	195.4	491.4	1.98
2,371.0	16.61	22.46	2,304.9	475.2	205.4	517.7	1.10
2,465.0	16.64	26.06	2,395.0	499.7	216.4	544.6	1.10
2,560.0	14.53	24.04	2,486.5	522.8	227.3	570.1	2.29
2,654.0	14.59	31.08	2,577.5	543.7	238.2	593.6	1.88
2,748.0	14.03	30.55	2,668.6	563.7	250.1	616.6	0.61
2,843.0	13.27	30.67	2,760.9	583.0	261.5	638.8	0.80
2,937.0	12.45	29.88	2,852.5	601.0	272.1	659.6	0.89
3,031.0	10.67	37.85	2,944.6	616.7	282.4	678.1	2.54
3,125.0	8.46	39.17	3,037.3	628.9	292.2	693.2	2.36
3,220.0	6.43	42.90	3,131.5	638.2	300.2	704.9	2.20
3,314.0	4.45	48.94	3,225.1	644.5	306.5	713.1	2.19
3,408.0	3.84	55.68	3,318.8	648.7	311.9	719.1	0.83
3,503.0	1.43	51.10	3,413.7	651.2	315.4	722.8	2.54
3,594.3	1.51	42.81	3,505.0	652.8	317.1	725.0	0.25
<b>698-4-14 F</b>							
3,595.3	1.51	42.73	3,506.0	652.8	317.1	725.0	0.25
<b>Cylinder Entry Point</b>							
3,597.0	1.51	42.58	3,507.7	652.8	317.2	725.0	0.25
3,691.0	1.36	18.34	3,601.7	654.8	318.4	727.3	0.66

## Design Report for SKR-698-04-AV-12 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
3,786.0	1.58	3.04	3,696.6	657.2	318.8	729.7	0.47
3,880.0	1.51	351.01	3,790.6	659.7	318.7	731.9	0.35
3,974.0	1.73	347.43	3,884.6	662.3	318.2	734.1	0.26
4,069.0	1.53	324.71	3,979.5	664.8	317.1	735.9	0.71
4,163.0	1.96	300.64	4,073.5	666.6	315.0	736.8	0.89
4,257.0	2.15	293.54	4,167.4	668.1	312.0	737.0	0.34
4,352.0	2.17	293.84	4,262.4	669.6	308.7	737.1	0.02
4,541.0	2.34	285.56	4,451.2	672.0	301.7	736.6	0.19
4,635.0	2.32	296.56	4,545.1	673.4	298.2	736.4	0.48
4,729.0	1.78	288.67	4,639.1	674.7	295.1	736.4	0.65
4,824.0	2.18	289.33	4,734.0	675.8	292.0	736.2	0.42
4,918.0	2.69	286.00	4,827.9	677.0	288.2	735.8	0.56
5,012.0	2.03	280.92	4,921.9	677.9	284.4	735.1	0.74
5,107.0	2.09	273.91	5,016.8	678.4	281.1	734.2	0.27
5,201.0	1.85	262.29	5,110.7	678.3	277.8	732.9	0.49
5,296.0	1.77	259.88	5,205.7	677.8	274.9	731.3	0.12
5,390.0	0.95	254.83	5,299.7	677.3	272.7	730.0	0.88
5,485.0	1.48	264.07	5,394.6	677.0	270.7	728.9	0.59
5,579.0	1.99	271.17	5,488.6	676.9	267.9	727.7	0.59
5,673.0	2.11	283.51	5,582.5	677.4	264.6	726.8	0.49
5,768.0	2.63	284.40	5,677.5	678.3	260.8	726.2	0.55
5,862.0	3.34	282.75	5,771.3	679.5	256.0	725.3	0.76
5,862.7	3.34	282.76	5,772.0	679.5	256.0	725.3	0.27
Cylinder Bottom - Cylinder Exit Point							
5,957.0	3.58	284.20	5,866.2	680.8	250.4	724.4	0.27
6,040.0	3.37	284.07	5,949.0	682.0	245.5	723.6	0.25
Final 6" MWD Survey - 698-4-14b F							
6,090.0	3.37	284.07	5,998.9	682.7	242.7	723.1	0.00
Projection to Bit							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
120.0	120.0	0.2	0.2	First GWD Survey
519.0	516.4	33.9	17.2	Final GWD Survey
578.0	573.9	46.0	22.6	First 8" MWD Survey
951.0	934.3	134.4	60.6	Final 8" MWD Survey
1,050.0	1,029.7	158.4	71.4	First 6" MWD Survey
3,595.3	3,506.0	652.8	317.1	Cylinder Entry Point
5,862.7	5,772.0	679.5	256.0	Cylinder Bottom
5,862.7	5,772.0	679.5	256.0	Cylinder Exit Point
6,040.0	5,949.0	682.0	245.5	Final 6" MWD Survey
6,090.0	5,998.9	682.7	242.7	Projection to Bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/_S (ft)	+E/-W (ft)	
Target		23.24	Slot	0.0	0.0	0.0

**Design Report for SKR-698-04-AV-12 - Actual Field Surveys****Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
120.0	519.0	GWD Surveys	GYD_GWD_SS
578.0	951.0	8" MWD Surveys	MWD
1,050.0	6,090.0	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
698-4-14 F	0.00	0.00	3,506.0	640.3	275.0	1,641,726.80	2,200,128.00	39° 33' 39.714 N	108° 20' 14.976 W
- actual wellpath misses target center by 44.0ft at 3594.3ft MD (3505.0 TVD, 652.8 N, 317.1 E)									
- Ellipse (radii L45.0 W80.0 on 0.00 azi) - Target Cylinder 100% Intersected									
698-4-14b F	0.00	0.00	5,971.0	640.3	275.0	1,641,726.80	2,200,128.00	39° 33' 39.714 N	108° 20' 14.976 W
- actual wellpath misses target center by 55.6ft at 6040.0ft MD (5949.0 TVD, 682.0 N, 245.5 E)									
- Point									