

# Chevron USA

Piceance

SKR-598-36-BV (New)

SKR-598-36-BV-16 - Slot 16

598-36-36

Design: Actual Field Surveys

## Sperry Drilling Services

### Standard Report

09 April, 2009

Well Coordinates (NAD83): 1,643,843.71 N, 2,197,637.45 E (39° 33' 59.86" N, 108° 20' 47.61" W)

Ground Level: 6,032.60 ft

Local Coordinate Origin: Centered on Well SKR-598-36-BV-16 (Slot 16) - Slot

Viewing Datum: RFE @ 6057.6ft (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-598-36-BV (New)  
Well: SKR-598-36-BV-16  
Wellbore: 598-36-36  
Plan: Actual Field Surveys

# Chevron USA

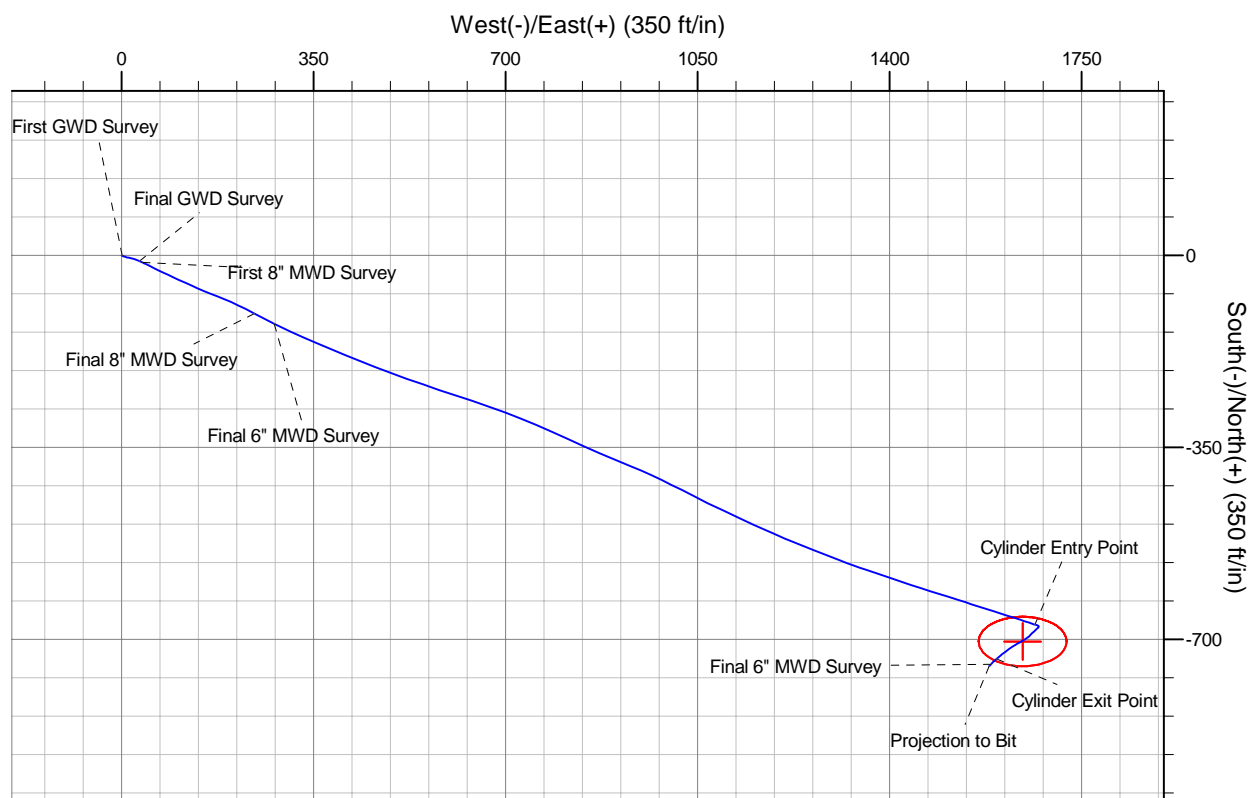
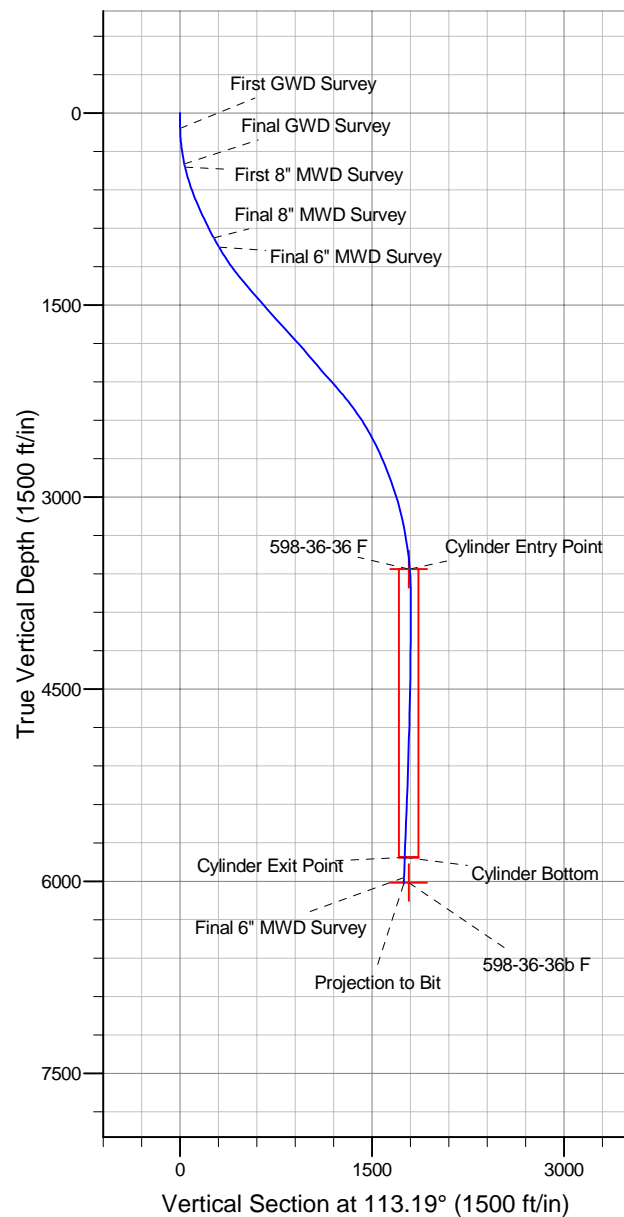
**HALLIBURTON**  
Drilling and Formation  
Evaluation

## WELL DETAILS: SKR-598-36-BV-16

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1643843.71	2197637.45	39° 33' 59.856 N	108° 20' 47.608 W	Slot 16

## WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
598-36-36 F	3563.0	-703.6	1642.6	1643140.11	2199280.00	Ellipse (Radii: L45.0 W80.0)
598-36-36b F	6011.0	-703.6	1642.6	1643140.11	2199280.00	Point



## Design Report for SKR-598-36-BV-16 - 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	1.32	116.99	120.0	-0.6	1.2	1.4	1.10
<b>First GWD Survey</b>							
151.0	2.73	111.88	151.0	-1.1	2.2	2.5	4.58
183.0	3.88	109.59	182.9	-1.7	4.0	4.3	3.62
214.0	5.02	105.53	213.8	-2.4	6.3	6.7	3.81
245.0	6.43	104.30	244.7	-3.2	9.2	9.8	4.57
275.0	7.67	103.07	274.4	-4.1	12.8	13.4	4.16
306.0	8.99	104.83	305.1	-5.2	17.2	17.8	4.34
337.0	9.60	108.70	335.7	-6.6	22.0	22.8	2.82
367.0	10.84	109.23	365.2	-8.4	27.0	28.1	4.15
398.0	11.81	112.58	395.6	-10.5	32.7	34.2	3.78
<b>Final GWD Survey</b>							
425.0	12.80	113.70	422.0	-12.8	38.0	39.9	3.77
<b>First 8" MWD Survey</b>							
455.0	14.10	115.70	451.2	-15.7	44.3	46.9	4.60
486.0	15.40	116.20	481.2	-19.2	51.4	54.8	4.21
517.0	16.80	116.40	510.9	-23.0	59.1	63.4	4.52
548.0	17.80	116.40	540.5	-27.1	67.4	72.6	3.23
578.0	18.80	115.80	569.0	-31.2	75.8	82.0	3.39
609.0	19.70	115.30	598.3	-35.6	85.1	92.2	2.95
640.0	21.00	114.90	627.4	-40.2	94.8	103.0	4.22
670.0	22.00	114.60	655.3	-44.8	104.8	114.0	3.35
701.0	22.80	114.40	683.9	-49.7	115.5	125.8	2.59
733.0	23.60	114.20	713.3	-54.9	127.0	138.4	2.51
764.0	24.00	113.60	741.7	-60.0	138.5	150.9	1.51
796.0	24.40	112.60	770.9	-65.1	150.5	164.0	1.79
827.0	24.80	111.80	799.1	-70.0	162.5	176.9	1.68
858.0	25.40	111.40	827.1	-74.8	174.7	190.1	2.01
890.0	25.90	112.10	856.0	-80.0	187.6	203.9	1.83
921.0	26.30	114.00	883.8	-85.3	200.1	217.5	2.99
953.0	26.70	116.00	912.5	-91.3	213.1	231.8	3.06
984.0	27.40	116.90	940.1	-97.6	225.7	245.9	2.62
1,023.0	29.10	117.00	974.4	-106.0	242.1	264.3	4.36
<b>Final 8" MWD Survey</b>							
1,105.0	30.40	117.00	1,045.6	-124.4	278.4	304.9	1.59
<b>Final 6" MWD Survey</b>							
1,168.0	32.00	115.10	1,099.5	-138.8	307.7	337.5	2.98
1,263.0	34.80	112.70	1,178.8	-159.9	355.5	389.8	3.26
1,357.0	37.40	112.10	1,254.8	-181.0	406.7	445.1	2.79
1,452.0	41.00	111.30	1,328.4	-203.2	462.5	505.2	3.83
1,546.0	40.70	110.00	1,399.5	-224.9	520.1	566.6	0.96
1,641.0	41.40	107.90	1,471.1	-245.1	579.1	628.8	1.63
1,735.0	41.80	108.70	1,541.4	-264.7	638.3	691.0	0.71
1,830.0	41.90	110.30	1,612.2	-285.9	698.0	754.2	1.13
1,924.0	41.90	113.00	1,682.2	-309.0	756.4	817.0	1.92
2,018.0	42.50	115.20	1,751.8	-334.8	814.0	880.1	1.70
2,113.0	42.00	113.00	1,822.1	-360.9	872.3	943.9	1.64
2,207.0	39.90	112.10	1,893.1	-384.5	929.2	1,005.5	2.32
2,302.0	40.10	116.10	1,965.9	-409.5	984.9	1,066.6	2.71

**Design Report for SKR-598-36-BV-16 - Actual Field Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
2,396.0	42.60	117.10	2,036.5	-437.3	1,040.4	1,128.6	2.75
2,491.0	41.70	115.50	2,106.9	-465.5	1,097.6	1,192.2	1.47
2,585.0	40.20	114.40	2,177.9	-491.5	1,153.4	1,253.8	1.77
2,680.0	38.50	112.70	2,251.3	-515.6	1,208.6	1,314.0	2.12
2,774.0	35.70	111.50	2,326.3	-536.9	1,261.2	1,370.7	3.08
2,869.0	32.60	111.50	2,404.9	-556.5	1,310.8	1,424.0	3.26
2,963.0	29.50	108.00	2,485.5	-572.9	1,356.3	1,472.4	3.82
3,058.0	27.30	108.50	2,569.0	-587.1	1,399.3	1,517.4	2.33
3,152.0	25.10	108.80	2,653.4	-600.3	1,438.6	1,558.8	2.34
3,247.0	21.80	107.00	2,740.5	-612.0	1,474.5	1,596.4	3.55
3,341.0	21.20	107.30	2,828.0	-622.1	1,507.5	1,630.6	0.65
3,436.0	19.40	109.10	2,917.0	-632.4	1,538.8	1,663.5	2.01
3,530.0	16.90	107.30	3,006.4	-641.6	1,566.6	1,692.6	2.73
3,624.0	14.80	107.20	3,096.8	-649.2	1,591.1	1,718.2	2.23
3,719.0	12.20	107.10	3,189.2	-655.7	1,612.3	1,740.2	2.74
3,813.0	10.50	107.40	3,281.3	-661.2	1,629.9	1,758.6	1.81
3,908.0	8.70	110.20	3,375.0	-666.3	1,644.9	1,774.4	1.96
4,002.0	6.50	106.70	3,468.1	-670.3	1,656.7	1,786.8	2.39
4,096.0	4.00	108.70	3,561.7	-672.9	1,664.9	1,795.4	2.67
4,096.5	3.99	108.70	3,562.2	-672.9	1,664.9	1,795.4	2.11
<b>598-36-36 F</b>							
4,097.3	3.97	108.70	3,563.0	-672.9	1,665.0	1,795.4	2.11
<b>Cylinder Entry Point</b>							
4,191.0	2.00	109.00	3,656.6	-674.5	1,669.6	1,800.3	2.11
4,285.0	0.30	142.90	3,750.6	-675.2	1,671.3	1,802.2	1.87
4,380.0	0.60	169.10	3,845.6	-675.9	1,671.6	1,802.7	0.38
4,474.0	0.80	194.30	3,939.6	-677.0	1,671.5	1,803.0	0.39
4,569.0	1.20	222.00	4,034.6	-678.4	1,670.7	1,802.8	0.65
4,664.0	1.40	229.20	4,129.5	-679.9	1,669.1	1,802.0	0.27
4,758.0	1.60	228.50	4,223.5	-681.5	1,667.3	1,800.9	0.21
4,852.0	1.80	221.80	4,317.5	-683.5	1,665.3	1,799.9	0.30
4,947.0	2.20	227.00	4,412.4	-685.8	1,663.0	1,798.7	0.46
5,041.0	2.50	227.00	4,506.3	-688.5	1,660.2	1,797.1	0.32
5,136.0	2.40	225.20	4,601.2	-691.3	1,657.2	1,795.5	0.13
5,230.0	2.80	228.20	4,695.1	-694.2	1,654.1	1,793.8	0.45
5,324.0	2.60	234.30	4,789.0	-697.0	1,650.7	1,791.8	0.37
5,419.0	2.90	240.00	4,883.9	-699.4	1,646.9	1,789.2	0.43
5,513.0	3.10	238.20	4,977.8	-702.0	1,642.6	1,786.3	0.24
5,608.0	3.20	238.10	5,072.7	-704.7	1,638.2	1,783.3	0.11
5,702.0	3.30	239.20	5,166.5	-707.5	1,633.6	1,780.2	0.13
5,797.0	3.70	240.10	5,261.3	-710.4	1,628.6	1,776.8	0.42
5,891.0	4.30	235.30	5,355.1	-713.9	1,623.1	1,773.1	0.73
5,986.0	4.50	237.40	5,449.8	-718.0	1,617.0	1,769.1	0.27
6,080.0	4.50	230.80	5,543.5	-722.3	1,611.1	1,765.3	0.55
6,175.0	4.30	232.30	5,638.3	-726.8	1,605.4	1,761.9	0.24
6,269.0	4.50	229.60	5,732.0	-731.4	1,599.8	1,758.5	0.31
6,349.3	4.75	228.06	5,812.0	-735.6	1,594.9	1,755.7	0.35
<b>Cylinder Exit Point - Cylinder Bottom</b>							
6,364.0	4.80	227.80	5,826.7	-736.4	1,594.0	1,755.2	0.35
6,458.0	5.10	225.10	5,920.3	-742.0	1,588.1	1,752.0	0.40
6,510.0	5.30	226.50	5,972.1	-745.3	1,584.7	1,750.2	0.46

## Design Report for SKR-598-36-BV-16 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
Final 6" MWD Survey							
6,542.2	5.30	226.50	6,004.2	-747.4	1,582.6	1,749.0	0.00
598-36-36b F							
6,560.0	5.30	226.50	6,021.9	-748.5	1,581.4	1,748.4	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	-0.6	1.2	First GWD Survey
398.0	395.6	-10.5	32.7	Final GWD Survey
425.0	422.0	-12.8	38.0	First 8" MWD Survey
1,023.0	974.4	-106.0	242.1	Final 8" MWD Survey
1,105.0	1,045.6	-124.4	278.4	Final 6" MWD Survey
4,097.3	3,563.0	-672.9	1,665.0	Cylinder Entry Point
6,349.3	5,812.0	-735.6	1,594.9	Cylinder Exit Point
6,349.3	5,812.0	-735.6	1,594.9	Cylinder Bottom
6,510.0	5,972.1	-745.3	1,584.7	Final 6" MWD Survey
6,560.0	6,021.9	-748.5	1,581.4	Projection to Bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (ft)	Origin +E/-W (ft)	Start TVD (ft)
Target	598-36-36 F	113.19	Slot	0.0	0.0	0.0

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
120.0	398.0	GWD Surveys	GYD_DP_MS
425.0	1,023.0	8" MWD Surveys	MWD
1,105.0	6,560.0	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
598-36-36 F	0.00	360.00	3,563.0	-703.6	1,642.6	1,643,140.11	2,199,280.00	39° 33' 53.414 N	108° 20' 26.362 W
- actual wellpath misses target center by 38.0ft at 4096.5ft MD (3562.2 TVD, -672.9 N, 1664.9 E)									
- Ellipse (radii L45.0 W80.0 on 360.00 azi) - Target Cylinder 100% Intersected									
598-36-36b F	0.00	360.00	6,011.0	-703.6	1,642.6	1,643,140.11	2,199,280.00	39° 33' 53.414 N	108° 20' 26.362 W
- actual wellpath misses target center by 74.6ft at 6542.2ft MD (6004.2 TVD, -747.4 N, 1582.6 E)									
- Point									