

Chevron USA

Piceance

SKR-598-36-AV

SKR-598-36-AV-21 - slot 21

598-36-44

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

02 December, 2008

Well Coordinates (NAD83): 1,645,983.49 N, 2,199,564.10 E (39° 34' 21.59" N, 108° 20' 23.87" W)

Ground Level: 6,342.00 ft

Local Coordinate Origin: Centered on Well SKR-598-36-AV-21 - Slot slot 21

Viewing Datum: RFE @ 6367.0ft (Original Well Elev)

TVDs to System: N

North Reference: Grid

Unit System: API - US Survey Feet

Version: 2003.16 Build: 42B

HALLIBURTON

Project: Piceance
Site: SKR-598-36-AV
Well: SKR-598-36-AV-21
Wellbore: 598-36-44
Plan: Actual Field Surveys

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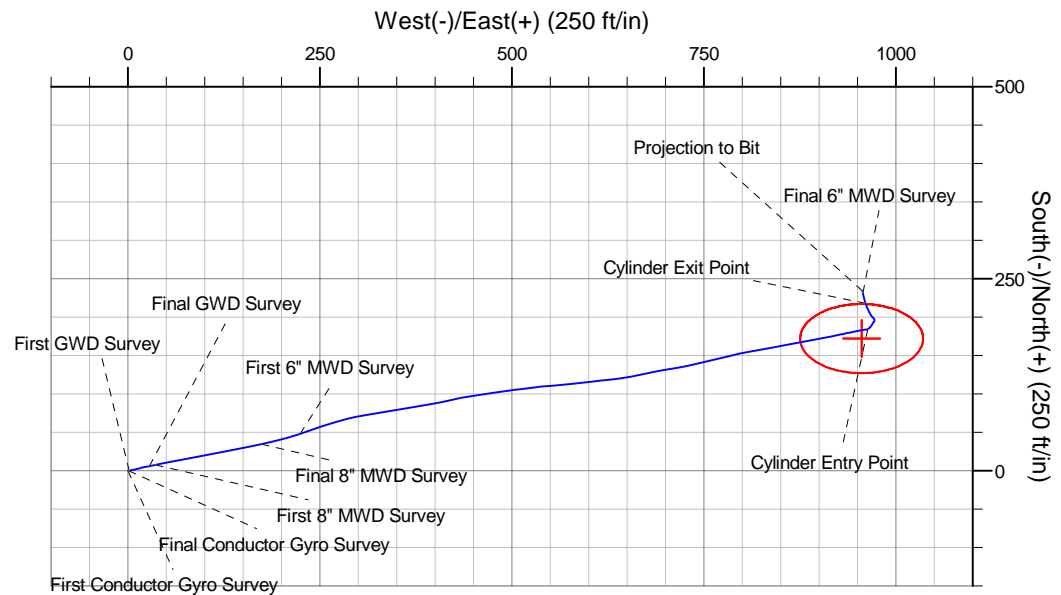
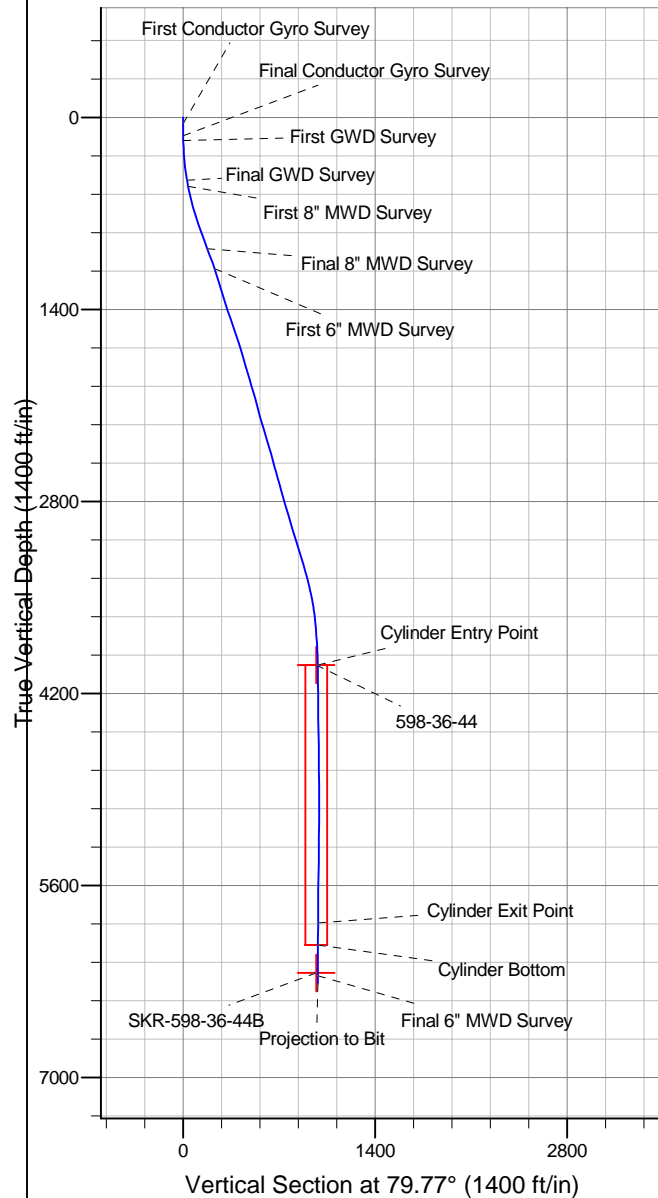
Drilling and Formation
Evaluation

WELL DETAILS: SKR-598-36-AV-21

+N/-S	+E/-W	Northing	Easting	Ground Level: 6342.0	Latitude	Longitude	Slot
0.0	0.0	1645983.49	2199564.10	39° 34' 21.590 N	108° 20' 23.871 W	slot 21	

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
598-36-44	3993.0	172.4	955.3	1646155.84	2200519.36	Ellipse (Radii: L45.0 W80.0)
SKR-598-36-44B	6238.0	172.4	955.3	1646155.84	2200519.36	Point



Design Report for SKR-598-36-AV-21 - 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
45.0	0.40	69.37	45.0	0.1	0.1	0.2	0.89
First Conductor Gyro Survey							
65.0	0.44	73.25	65.0	0.1	0.3	0.3	0.25
85.0	0.62	68.26	85.0	0.2	0.5	0.5	0.93
105.0	0.60	65.35	105.0	0.2	0.7	0.7	0.18
125.0	0.56	73.83	125.0	0.3	0.8	0.9	0.47
135.0	0.58	84.02	135.0	0.3	0.9	1.0	1.03
Final Conductor Gyro Survey							
168.0	1.50	80.71	168.0	0.4	1.5	1.6	2.79
First GWD Survey							
229.0	2.64	77.01	228.9	0.9	3.7	3.8	1.88
291.0	4.58	78.77	290.8	1.7	7.5	7.7	3.13
367.0	6.96	76.13	366.4	3.4	15.0	15.3	3.15
460.0	9.60	78.77	458.5	6.2	28.0	28.7	2.87
Final GWD Survey							
505.0	10.66	77.18	502.8	7.9	35.8	36.6	2.44
First 8" MWD Survey							
564.0	12.84	79.37	560.5	10.3	47.5	48.6	3.77
656.0	15.42	79.52	649.7	14.4	69.6	71.1	2.80
748.0	18.36	78.93	737.7	19.4	95.9	97.8	3.20
843.0	19.57	79.19	827.6	25.3	126.2	128.7	1.28
937.0	20.59	78.42	915.9	31.6	157.8	160.9	1.12
982.0	21.25	78.08	957.9	34.8	173.6	177.0	1.49
Final 8" MWD Survey							
1,135.0	18.80	71.73	1,101.7	48.3	224.1	229.1	2.14
First 6" MWD Survey							
1,229.0	17.13	70.79	1,191.1	57.6	251.6	257.8	1.80
1,324.0	17.05	74.24	1,281.9	66.0	278.2	285.5	1.07
1,418.0	17.73	80.68	1,371.6	72.0	305.6	313.5	2.17
1,512.0	19.16	80.63	1,460.8	76.9	334.9	343.3	1.52
1,606.0	18.71	80.55	1,549.7	81.9	365.0	373.8	0.48
1,701.0	17.87	79.99	1,639.9	86.9	394.4	403.6	0.90
1,795.0	16.15	76.95	1,729.8	92.3	421.4	431.1	2.06
1,889.0	16.73	80.82	1,819.9	97.5	447.4	457.6	1.32
1,984.0	17.02	82.33	1,910.8	101.5	474.7	485.2	0.55
2,078.0	16.00	82.04	2,001.0	105.1	501.2	511.9	1.09
2,172.0	14.81	82.73	2,091.6	108.4	525.9	536.8	1.28
2,267.0	15.54	85.95	2,183.3	110.9	550.7	561.6	1.17
2,361.0	16.60	83.92	2,273.6	113.2	576.6	587.5	1.28
2,455.0	16.83	83.21	2,363.6	116.2	603.5	614.5	0.33
2,550.0	15.71	84.52	2,454.8	119.1	629.9	641.0	1.24
2,644.0	16.08	78.45	2,545.2	122.9	655.3	666.7	1.81
2,738.0	14.49	78.43	2,635.9	127.9	679.6	691.5	1.69
2,833.0	15.73	80.89	2,727.6	132.3	704.0	716.3	1.47
2,927.0	16.58	77.31	2,817.9	137.2	729.6	742.4	1.39
3,021.0	17.09	77.77	2,907.9	143.1	756.2	769.6	0.56
3,116.0	16.46	75.52	2,998.8	149.4	782.9	797.0	0.95
3,210.0	17.55	79.27	3,088.7	155.4	809.7	824.4	1.64
3,304.0	17.10	80.00	3,178.5	160.4	837.3	852.4	0.53

Design Report for SKR-598-36-AV-21 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
3,398.0	15.92	79.36	3,268.6	165.2	863.5	879.1	1.27
3,493.0	14.91	79.74	3,360.2	169.8	888.4	904.4	1.07
3,587.0	12.48	79.72	3,451.5	173.8	910.3	926.7	2.59
3,682.0	9.85	76.11	3,544.7	177.6	928.3	945.0	2.86
3,776.0	6.47	79.35	3,637.7	180.5	941.3	958.4	3.63
3,870.0	5.23	76.64	3,731.2	182.4	950.6	967.9	1.35
3,965.0	3.56	84.67	3,825.9	183.7	957.8	975.2	1.87
4,059.0	1.35	81.00	3,919.8	184.2	961.8	979.2	2.36
4,131.9	1.23	67.26	3,992.8	184.6	963.4	980.8	0.45
598-36-44							
4,132.2	1.23	67.21	3,993.0	184.6	963.4	980.8	0.45
Cylinder Entry Point							
4,153.0	1.21	62.87	4,013.8	184.8	963.8	981.3	0.45
4,248.0	0.64	50.46	4,108.8	185.6	965.1	982.7	0.63
4,342.0	0.84	40.10	4,202.8	186.4	965.9	983.7	0.26
4,437.0	0.95	40.46	4,297.8	187.6	966.9	984.8	0.12
4,531.0	1.04	32.96	4,391.8	188.9	967.8	986.0	0.17
4,625.0	0.89	37.17	4,485.8	190.2	968.8	987.1	0.18
4,720.0	0.79	29.44	4,580.8	191.3	969.5	988.1	0.16
4,814.0	0.91	25.96	4,674.7	192.6	970.2	988.9	0.14
4,908.0	0.74	39.18	4,768.7	193.7	970.9	989.8	0.27
5,003.0	0.83	44.24	4,863.7	194.7	971.7	990.9	0.12
5,097.0	0.88	357.04	4,957.7	195.9	972.2	991.5	0.73
5,192.0	1.12	335.42	5,052.7	197.5	971.8	991.4	0.47
5,286.0	1.13	318.10	5,146.7	199.0	970.8	990.7	0.36
5,380.0	1.26	315.64	5,240.7	200.4	969.4	989.6	0.15
5,475.0	1.54	326.16	5,335.6	202.2	968.0	988.5	0.40
5,569.0	1.80	334.55	5,429.6	204.6	966.6	987.6	0.38
5,663.0	1.82	329.43	5,523.5	207.2	965.2	986.7	0.17
5,758.0	2.23	330.48	5,618.5	210.1	963.6	985.6	0.43
5,852.0	1.98	341.69	5,712.4	213.3	962.2	984.7	0.51
5,947.0	1.88	344.56	5,807.4	216.3	961.2	984.4	0.15
6,014.7	1.95	338.34	5,875.0	218.5	960.5	984.0	0.32
Cylinder Exit Point							
6,041.0	1.98	336.04	5,901.3	219.3	960.2	983.8	0.32
6,135.0	2.05	347.45	5,995.3	222.4	959.1	983.4	0.43
6,174.8	2.10	347.36	6,035.0	223.8	958.8	983.3	0.13
Cylinder Bottom							
6,230.0	2.17	347.25	6,090.2	225.8	958.4	983.2	0.13
6,324.0	2.09	344.35	6,184.1	229.2	957.5	983.0	0.14
6,375.8	2.19	345.52	6,235.9	231.1	957.0	982.8	0.20
SKR-598-36-44B							
6,400.0	2.23	346.03	6,260.1	232.0	956.8	982.8	0.20
Final 6" MWD Survey							
6,460.0	2.23	346.03	6,320.0	234.3	956.2	982.6	0.00
Projection to Bit							

Design Report for SKR-598-36-AV-21 - Actual Field Surveys**Design Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
45.0	45.0	0.1	0.1	First Conductor Gyro Survey
135.0	135.0	0.3	0.9	Final Conductor Gyro Survey
168.0	168.0	0.4	1.5	First GWD Survey
460.0	458.5	6.2	28.0	Final GWD Survey
505.0	502.8	7.9	35.8	First 8" MWD Survey
982.0	957.9	34.8	173.6	Final 8" MWD Survey
1,135.0	1,101.7	48.3	224.1	First 6" MWD Survey
4,132.2	3,993.0	184.6	963.4	Cylinder Entry Point
6,014.7	5,875.0	218.5	960.5	Cylinder Exit Point
6,174.8	6,035.0	223.8	958.8	Cylinder Bottom
6,400.0	6,260.1	232.0	956.8	Final 6" MWD Survey
6,460.0	6,320.0	234.3	956.2	Projection to Bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/_S (ft)	+E/-W (ft)	
User	598-36-44	79.77	Slot	0.0	0.0	0.0

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
45.0	135.0	Conductor Gyros	NS-GYRO-MS
168.0	460.0	GWD Surveys	GYD_GWD_SS
505.0	982.0	8" MWD Surveys	MWD
1,135.0	6,460.0	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
SKR-598-36-44B	0.00	0.00	6,238.0	172.4	955.3	1,646,155.84	2,200,519.36	39° 34' 23.587 N	108° 20' 11.746 W
- actual wellpath misses by 58.8ft at 6375.8ft MD (6235.9 TVD, 231.1 N, 957.0 E)									
- Point									
598-36-44	0.00	0.00	3,993.0	172.4	955.3	1,646,155.84	2,200,519.36	39° 34' 23.587 N	108° 20' 11.746 W
- actual wellpath misses by 14.7ft at 4131.9ft MD (3992.8 TVD, 184.6 N, 963.4 E)									
- Ellipse (radii L45.0 W80.0 on 0.00 azi) - Target Cylinder 92% Intersected									