

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 11-T2N-R65W

Dowdy 13-11 - Slot A 1

Plan A Rev 2

Survey: Sperry MWD Surveys

Standard Survey Report

11 May, 2011

HALLIBURTON

Sperry Drilling

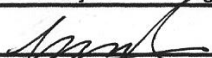

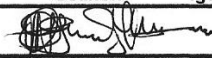
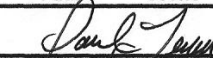
SPERRY-SUN DRILLING SERVICES CERTIFIED SURVEY WORK SHEET

OPERATOR:	Anadarko
WELL:	Dowdy 13-11
FIELD:	Sec. 11-T2N-R65W
RIG:	Xtreme 8
LEGALS:	Sec. 11-T2N-R65W
COUNTY:	Weld
STATE:	Colorado
CAL. METHOD:	Minimum Curvature
MAG. DECL. APPLIED:	8.77
VERTICAL SEC. DIR. :	227.890

SSDS Job Number :	CA-MJ-0008021307
Start Date of Job :	3/20/2011
End Date of Job :	3/23/2011
Lead Directional Driller:	Wade Tobin
	Paul Jevne
Other SSDS DD's :	Jerry McCain
SSDS MWD Engineers :	Uyen Nguyen
	Osahon Igunbor
	Robert Lea

	Main Hole =====>	1st Side Track =====>	2nd Side Track =====>	3rd Side Track =====>	4th Side Track =====>
ESS Survey	Tie On	Tie On	Tie On	Tie On	Tie On
First Survey Depth	MWD				
Last Survey Depth					
KOP Depth/Sidetrack MD	KOP	KOP-ST1	KOP-ST2	KOP-ST3	KOP-ST4
First Survey Depth	84.00 MWD	MWD	MWD	MWD	MWD
Last Survey Depth	7354.00 MWD	MWD	MWD	MWD	MWD
Bit Extrapolation to TD	7404.00 T.D.	T.D.	T.D.	T.D.	T.D.

The following Sperry Sun Drilling Services personnel listed below, do certify the above survey information to be accurate :

Print Name : Uyen Nguyen	Print Name : Wade Tobin	Print Name :
Sign Name : 	Sign Name : 	Sign Name :
Print Name : Osahon Igunbor	Print Name : Paul Jevne	Print Name :
Sign Name : 	Sign Name : 	Sign Name :

Examples of Survey Types:	TieOn	Tie On to Surface Casing (Assumed Vertical), Tie On to existing MWD Survey (prior drilled hole)
MWD		Sperry Sun Drilling Services (SSDS) Measurement While Drilling (MWD) Survey's
ESS		Sperry Sun Drilling Services (SSDS) Electronic Survey System (ESS) Survey's
Gyro		Gyro Survey's ; Provided by third party vendor, or by Sperry Sun Drilling Services (SSDS)
SS		Single Shot (SS) Survey's ; Provided by Sperry Sun Drilling Services (SSDS) or third party vendor.

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Dowdy 13-11 - Slot A 1
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB 17' @ 4883.00ft (Extreme 8)
Site:	Sec. 11-T2N-R65W	MD Reference:	RKB 17' @ 4883.00ft (Extreme 8)
Well:	Dowdy 13-11	North Reference:	Grid
Wellbore:	Plan A Rev 2	Survey Calculation Method:	Minimum Curvature
Design:	Sperry MWD Survey	Database:	EDM 2003.16 Single User Db

Project	Weld County, CO (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Sec. 11-T2N-R65W				
Site Position:		Northing:	1,298,134.39ft	Latitude:	40.148550
From:	Lat/Long	Easting:	3,241,273.69ft	Longitude:	-104.636887
Position Uncertainty:	0.00 ft	Slot Radius:	"	Grid Convergence:	0.56 °

Well	Dowdy 13-11 - Slot A 1					
Well Position	+N/-S	0.00 ft	Northing:	1,298,134.39 ft	Latitude:	40.148550
	+E/-W	0.00 ft	Easting:	3,241,273.69 ft	Longitude:	-104.636887
Position Uncertainty		0.00 ft	Wellhead Elevation:	4,866.00 ft	Ground Level:	4,866.00 ft

Wellbore	Plan A Rev 2				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2010	3/31/2011	8.76	66.89	53,010

Design	Sperry MWD Survey				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:		Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
		0.00	0.00	0.00	227.899

Survey Program	Date 5/11/2011				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
84.00	7,404.00	Sperry MWD Surveys (Plan A Rev 2)	MWD	MWD - Standard	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
84.00	0.51	100.676	84.00	-0.07	0.37	-0.23	0.61	0.61	0.00	
First Sperry MWD Survey at 84.00 ft										
177.00	0.50	83.540	177.00	-0.10	1.17	-0.80	0.16	-0.01	-18.43	
269.00	0.51	244.926	268.99	-0.23	1.20	-0.74	1.08	0.01	175.42	
361.00	2.38	251.585	360.96	-1.01	-0.99	1.41	2.04	2.04	7.24	
451.00	4.57	236.046	450.79	-3.60	-5.73	6.67	2.62	2.43	-17.27	
541.00	6.67	226.532	540.36	-9.20	-12.50	15.44	2.55	2.34	-10.57	
629.00	8.98	226.607	627.53	-17.44	-21.21	27.42	2.62	2.62	0.09	
719.00	9.54	226.286	716.36	-27.42	-31.70	41.90	0.62	0.62	-0.36	
801.00	8.81	227.547	797.31	-36.35	-41.25	54.97	0.92	-0.89	1.54	
895.00	9.65	227.477	890.09	-46.53	-52.36	70.05	0.89	0.89	-0.07	
985.00	12.24	226.252	978.45	-58.23	-64.81	87.12	2.89	2.88	-1.36	

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Dowdy 13-11 - Slot A 1
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB 17' @ 4883.00ft (Extreme 8)
Site:	Sec. 11-T2N-R65W	MD Reference:	RKB 17' @ 4883.00ft (Extreme 8)
Well:	Dowdy 13-11	North Reference:	Grid
Wellbore:	Plan A Rev 2	Survey Calculation Method:	Minimum Curvature
Design:	Sperry MWD Survey	Database:	EDM 2003.16 Single User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,074.00	14.90	228.007	1,064.95	-72.41	-80.13	108.00	3.03	2.99	1.97
1,162.00	14.30	227.146	1,150.11	-87.37	-96.51	130.18	0.73	-0.69	-0.98
1,252.00	16.53	227.154	1,236.87	-103.64	-114.04	154.10	2.49	2.49	0.01
1,341.00	16.65	228.409	1,322.17	-120.71	-132.86	179.51	0.42	0.13	1.41
1,429.00	16.23	229.335	1,406.57	-137.09	-151.62	204.41	0.57	-0.48	1.05
1,519.00	15.67	228.777	1,493.10	-153.29	-170.30	229.13	0.64	-0.62	-0.62
1,607.00	17.91	231.577	1,577.35	-169.54	-189.85	254.53	2.71	2.55	3.18
1,659.00	17.69	232.497	1,626.86	-179.32	-202.38	270.38	0.69	-0.43	1.77
1,785.00	17.20	231.131	1,747.06	-202.66	-232.07	308.06	0.51	-0.39	-1.08
1,871.00	16.58	229.630	1,829.35	-218.59	-251.32	333.02	0.88	-0.72	-1.75
1,961.00	16.05	228.947	1,915.73	-235.08	-270.48	358.29	0.63	-0.59	-0.76
2,049.00	15.27	228.745	2,000.46	-250.71	-288.37	382.04	0.88	-0.88	-0.23
2,135.00	16.09	227.872	2,083.26	-266.17	-305.72	405.29	0.99	0.95	-1.02
2,222.00	14.87	227.193	2,167.10	-281.85	-322.85	428.51	1.42	-1.41	-0.78
2,309.00	15.59	227.310	2,251.05	-297.35	-339.63	451.35	0.83	0.83	0.13
2,396.00	16.69	229.501	2,334.62	-313.39	-357.72	475.53	1.45	1.27	2.52
2,485.00	16.28	229.680	2,419.96	-329.76	-376.95	500.77	0.47	-0.47	0.20
2,571.00	14.47	227.823	2,502.88	-344.78	-394.10	523.56	2.18	-2.10	-2.16
2,658.00	15.10	224.943	2,587.00	-360.10	-410.17	545.75	1.12	0.73	-3.31
2,745.00	16.28	224.277	2,670.76	-376.85	-426.69	569.24	1.37	1.35	-0.77
2,835.00	15.18	222.505	2,757.38	-394.58	-443.46	593.57	1.33	-1.22	-1.97
2,923.00	14.67	220.955	2,842.42	-411.49	-458.55	616.11	0.74	-0.58	-1.76
3,010.00	12.16	221.651	2,927.04	-426.66	-471.86	636.15	2.89	-2.89	0.80
3,099.00	10.26	224.919	3,014.34	-439.27	-483.68	653.38	2.25	-2.14	3.67
3,186.00	8.88	229.052	3,100.12	-449.16	-494.23	667.83	1.77	-1.58	4.75
3,272.00	6.02	224.845	3,185.39	-456.71	-502.42	678.97	3.38	-3.33	-4.89
3,360.00	4.09	234.701	3,273.04	-461.79	-508.24	686.70	2.40	-2.19	11.20
3,450.00	1.45	240.215	3,362.93	-464.21	-511.84	691.00	2.94	-2.93	6.13
3,538.00	0.64	30.425	3,450.92	-464.34	-512.56	691.61	2.31	-0.92	170.69
3,626.00	0.57	63.728	3,538.92	-463.72	-511.92	690.72	0.40	-0.08	37.84
3,714.00	0.24	27.065	3,626.92	-463.36	-511.44	690.12	0.46	-0.37	-41.66
3,804.00	0.49	302.864	3,716.92	-462.98	-511.67	690.04	0.58	0.27	-93.56
3,893.00	0.62	280.961	3,805.91	-462.68	-512.46	690.43	0.28	0.15	-24.61
3,982.00	0.74	261.359	3,894.91	-462.68	-513.50	691.20	0.29	0.14	-22.03
4,069.00	0.82	242.726	3,981.90	-463.05	-514.61	692.27	0.30	0.09	-21.42
4,158.00	0.73	260.874	4,070.89	-463.43	-515.73	693.36	0.29	-0.09	20.39
4,247.00	0.85	310.503	4,159.88	-463.09	-516.80	693.92	0.76	0.14	55.76
4,337.00	0.66	301.829	4,249.87	-462.38	-517.75	694.15	0.25	-0.22	-9.64
4,424.00	0.41	299.200	4,336.87	-461.96	-518.45	694.39	0.29	-0.28	-3.02
4,512.00	0.54	309.463	4,424.87	-461.54	-519.04	694.55	0.18	0.15	11.66
4,602.00	0.60	292.268	4,514.86	-461.10	-519.81	694.82	0.20	0.06	-19.11
4,692.00	1.04	296.070	4,604.85	-460.56	-520.98	695.32	0.50	0.50	4.22
4,778.00	0.58	54.615	4,690.85	-459.96	-521.33	695.18	1.65	-0.54	137.84
4,865.00	0.64	42.624	4,777.84	-459.35	-520.64	694.26	0.16	0.08	-13.78
4,954.00	0.88	34.823	4,866.84	-458.42	-519.91	693.10	0.29	0.27	-8.76
5,044.00	0.59	42.991	4,956.83	-457.52	-519.20	691.97	0.34	-0.33	9.08
5,132.00	0.24	34.335	5,044.83	-457.04	-518.79	691.34	0.40	-0.39	-9.84
5,218.00	0.58	344.473	5,130.82	-456.47	-518.81	690.97	0.54	0.40	-57.98
5,305.00	0.61	353.943	5,217.82	-455.58	-518.97	690.50	0.12	0.03	10.89
5,392.00	0.67	359.438	5,304.81	-454.62	-519.03	689.89	0.10	0.07	6.32
5,479.00	0.64	340.561	5,391.81	-453.66	-519.19	689.37	0.25	-0.03	-21.70
5,566.00	0.65	335.736	5,478.80	-452.75	-519.56	689.04	0.06	0.01	-5.55
5,652.00	0.86	332.634	5,564.80	-451.74	-520.05	688.72	0.25	0.25	-3.61
5,739.00	0.54	347.625	5,651.79	-450.76	-520.44	688.35	0.42	-0.37	17.23

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Dowdy 13-11 - Slot A 1
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB 17' @ 4883.00ft (Extreme 8)
Site:	Sec. 11-T2N-R65W	MD Reference:	RKB 17' @ 4883.00ft (Extreme 8)
Well:	Dowdy 13-11	North Reference:	Grid
Wellbore:	Plan A Rev 2	Survey Calculation Method:	Minimum Curvature
Design:	Sperry MWD Survey	Database:	EDM 2003.16 Single User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5,828.00	0.76	8.800	5,740.78	-449.77	-520.44	687.69	0.36	0.25	23.79
5,916.00	1.05	341.648	5,828.77	-448.43	-520.60	686.91	0.58	0.33	-30.85
6,004.00	1.10	314.300	5,916.76	-447.07	-521.46	686.64	0.58	0.06	-31.08
6,090.00	1.21	325.648	6,002.74	-445.75	-522.56	686.57	0.29	0.12	13.20
6,179.00	1.43	326.144	6,091.72	-444.05	-523.71	686.28	0.25	0.25	0.56
6,268.00	1.14	310.405	6,180.69	-442.55	-525.00	686.24	0.51	-0.32	-17.68
6,358.00	1.20	300.943	6,270.68	-441.49	-526.50	686.63	0.22	0.07	-10.51
6,446.00	1.14	291.573	6,358.66	-440.69	-528.11	687.29	0.23	-0.07	-10.65
6,535.00	0.99	281.331	6,447.64	-440.21	-529.68	688.14	0.27	-0.17	-11.51
6,623.00	0.84	263.760	6,535.63	-440.13	-531.07	689.12	0.36	-0.17	-19.97
6,712.00	0.92	255.271	6,624.62	-440.39	-532.42	690.29	0.17	0.09	-9.54
6,802.00	0.84	242.493	6,714.61	-440.88	-533.70	691.57	0.24	-0.09	-14.20
6,890.00	0.84	244.822	6,802.60	-441.45	-534.86	692.81	0.04	0.00	2.65
6,977.00	0.96	259.523	6,889.59	-441.85	-536.15	694.04	0.30	0.14	16.90
7,064.00	0.84	259.054	6,976.58	-442.11	-537.49	695.21	0.14	-0.14	-0.54
7,154.00	0.63	222.219	7,066.57	-442.60	-538.48	696.27	0.56	-0.23	-40.93
7,241.00	0.64	255.670	7,153.57	-443.08	-539.27	697.18	0.42	0.01	38.45
7,354.00	0.58	266.148	7,266.56	-443.27	-540.45	698.18	0.11	-0.06	9.27
Final Sperry MWD Survey at 7354.00 ft									
7,404.00	0.58	266.148	7,316.56	-443.31	-540.96	698.58	0.01	0.01	0.00
Straight Line Projection to TD at 7404.00 ft									

Targets

Target Name

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- Shape									
Dowdy 13-11 Plan A F	0.00	0.00	6,826.00	-450.00	-498.00	1,297,684.41	3,240,775.71	40.147328	-104.638684
- survey misses target center by 38.12ft at 6912.89ft MD (6825.49 TVD, -441.58 N, -535.17 E)									
- Rectangle (sides W400.00 H400.00 D445.00)									
Dowdy 13-11 Plan A F	0.00	0.00	7,271.00	-450.00	-498.00	1,297,684.41	3,240,775.71	40.147328	-104.638684
- survey misses target center by 43.21ft at 7354.00ft MD (7266.56 TVD, -443.27 N, -540.45 E)									
- Point									
Dowdy 19-11 (PAD) S	0.00	359.44	0.00	-0.05	32.15	1,298,134.34	3,241,305.84	40.148549	-104.636772
- survey misses target center by 32.15ft at 0.14ft MD (0.14 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1			0.00	-970.21	-1,006.45	1,297,164.22	3,240,267.28		
Point 2			0.00	-966.45	1,639.64	1,297,167.98	3,242,913.26		
Point 3			0.00	1,715.43	1,613.53	1,299,849.74	3,242,887.15		
Point 4			0.00	1,689.67	-1,032.34	1,299,823.99	3,240,241.39		

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
84.00	84.00	-0.07	0.37	First Sperry MWD Survey at 84.00 ft
7,354.00	7,266.56	-443.27	-540.45	Final Sperry MWD Survey at 7354.00 ft
7,404.00	7,316.56	-443.31	-540.96	Straight Line Projection to TD at 7404.00 ft

Checked By: _____ Approved By: _____ Date: _____

LEGEND

- Dowdy 13-11, Plan A Rev 2, Plan A Rev 2 Proposal V0
- - - Sperry MWD Surveys

