



30-015-38987

Marshall & Winston, Inc

Eddy County, NM
Sec. 25, T19S, R25E
Peacemaker Federal 25 #1H

Wellbore #1

Survey: MWD

DDC Survey Report

24 May, 2011

HOBBS OCD

SEP 20 2011

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CONFIDENTIAL



Company:	Marshall & Winston, Inc	Local Co-ordinate Reference:	Well Peacemaker Federal 25 #1H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3427.0usft (Patterson #101)
Site:	Sec. 25, T19S, R25E	MD Reference:	WELL @ 3427 0usft (Patterson #101)
Well:	Peacemaker Federal 25 #1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project:	Eddy County, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site		Sec 25, T19S, R25E			
Site Position:		Northing:	593,691 20 usft	Latitude:	32° 37' 55 596 N
From:	Map	Easting:	465,423 00 usft	Longitude:	104° 26' 44 345 W
Position Uncertainty:	0 0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0 06 °

Well	Peacemaker Federal 25 #1H					
Well Position	+N/-S	0 0 usft	Northing:	593,691 20 usft	Latitude:	32° 37' 55 596 N
	+E/-W	0.0 usft	Easting:	465,423.00 usft	Longitude:	104° 26' 44.345 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,427.0 usft

Wellbore		Wellbore #1			
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	5/12/2011	8 03	60.41	48,772

Design:		Wellbore #1							
Audit Notes:									
Version:		1 0	Phase:		ACTUAL	Tie On Depth:		0 0	
Vertical Section:		Depth From (TVD)		+N/-S		+E/-W		Direction	
		(usft)		(usft)		(usft)		(°)	
		0 0		0 0		0.0		177.40	

Survey Program		Date: 5/24/2011		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	1,983.0	Gyro Survey (Wellbore #1)	Good_gyro	Good Gyro
2,016.0	4,952.0	MWD (Wellbore #1)	MWD default	MWD - Standard

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
Tie-in to Gyro									
1,983.0	0.62	355.39	1,982.9	9.9	7.7	-9.6	0.00	0.00	0.00
2,016.0	0.70	4.10	2,015.9	10.3	7.7	-10.0	0.39	0.24	26.39
2,047.0	0.60	1.60	2,046.9	10.7	7.7	-10.3	0.34	-0.32	-8.06
2,079.0	0.60	344.50	2,078.9	11.0	7.7	-10.6	0.56	0.00	-53.44
2,110.0	0.50	327.80	2,109.9	11.3	7.6	-10.9	0.61	-0.32	-53.87
2,142.0	1.50	210.90	2,141.9	11.0	7.3	-10.7	5.57	3.13	-365.31
2,173.0	4.50	185.80	2,172.9	9.5	7.0	-9.1	10.34	9.68	-80.97
2,205.0	8.10	181.20	2,204.7	6.0	6.8	-5.7	11.35	11.25	-14.38
2,236.0	11.30	180.00	2,235.2	0.7	6.7	-0.4	10.34	10.32	-3.87

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Well:	Peacemaker Federal 25 #1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000 1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
2,268.0	14.50	177.70	2,266.4	-6.4	6.9	6.7	10.13	10.00	-7.19	
2,299.0	18.00	175.40	2,296.2	-15.0	7.4	15.4	11.48	11.29	-7.42	
2,331.0	21.20	174.20	2,326.3	-25.7	8.4	26.1	10.08	10.00	-3.75	
2,362.0	24.10	172.80	2,354.9	-37.6	9.8	38.0	9.51	9.35	-4.52	
2,394.0	27.00	172.50	2,383.8	-51.3	11.5	51.8	9.07	9.06	-0.94	
2,425.0	30.00	171.80	2,411.0	-65.9	13.6	66.5	9.74	9.68	-2.26	
2,457.0	32.90	170.90	2,438.3	-82.4	16.1	83.1	9.18	9.06	-2.81	
2,488.0	36.00	170.00	2,463.9	-99.7	19.0	100.5	10.13	10.00	-2.90	
2,520.0	39.00	169.60	2,489.3	-118.9	22.4	119.8	9.41	9.38	-1.25	
2,552.0	41.80	168.90	2,513.7	-139.3	26.3	140.3	8.86	8.75	-2.19	
2,583.0	44.80	168.80	2,536.2	-160.1	30.4	161.3	9.68	9.68	-0.32	
2,615.0	47.60	169.10	2,558.4	-182.8	34.9	184.2	8.78	8.75	0.94	
2,646.0	50.50	168.80	2,578.7	-205.8	39.3	207.3	9.38	9.35	-0.97	
2,678.0	53.20	168.10	2,598.4	-230.4	44.4	232.2	8.61	8.44	-2.19	
2,710.0	56.00	166.80	2,617.0	-255.9	50.1	257.9	9.36	8.75	-4.06	
2,741.0	58.80	166.90	2,633.7	-281.3	56.0	283.6	9.04	9.03	0.32	
2,773.0	61.40	167.40	2,649.6	-308.3	62.2	310.9	8.24	8.13	1.56	
2,804.0	64.00	167.20	2,663.8	-335.2	68.2	338.0	8.41	8.39	-0.65	
2,836.0	67.10	166.70	2,677.1	-363.6	74.8	366.6	9.79	9.69	-1.56	
2,867.0	70.50	166.60	2,688.3	-391.7	81.5	395.0	10.97	10.97	-0.32	
2,899.0	73.30	166.40	2,698.2	-421.3	88.6	424.9	8.77	8.75	-0.63	
2,930.0	75.80	166.30	2,706.5	-450.3	95.6	454.2	8.07	8.06	-0.32	
2,962.0	78.50	166.60	2,713.6	-480.6	102.9	484.8	8.49	8.44	0.94	
2,993.0	81.10	166.80	2,719.1	-510.3	110.0	514.8	8.41	8.39	0.65	
3,025.0	83.70	167.40	2,723.3	-541.2	117.0	546.0	8.33	8.13	1.88	
3,056.0	86.50	168.00	2,726.0	-571.4	123.6	576.4	9.24	9.03	1.94	
Crossed Hard Line @ 3071' MD										
3,071.3	87.22	168.19	2,726.8	-586.4	126.8	591.5	4.85	4.69	1.25	
3,088.0	88.00	168.40	2,727.5	-602.7	130.1	608.0	4.85	4.69	1.25	
3,120.0	89.20	168.30	2,728.3	-634.0	136.6	639.6	3.76	3.75	-0.31	
3,152.0	89.40	167.90	2,728.7	-665.4	143.2	671.2	1.40	0.63	-1.25	
3,183.0	89.80	168.20	2,728.9	-695.7	149.6	701.7	1.61	1.29	0.97	
3,215.0	90.20	168.20	2,728.9	-727.0	156.2	733.3	1.25	1.25	0.00	
3,247.0	90.40	169.30	2,728.7	-758.4	162.4	765.0	3.49	0.63	3.44	
3,278.0	90.70	169.80	2,728.4	-788.9	168.0	795.7	1.88	0.97	1.61	
3,310.0	90.00	170.80	2,728.2	-820.4	173.4	827.4	3.81	-2.19	3.13	
3,341.0	90.10	171.60	2,728.2	-851.0	178.2	858.3	2.60	0.32	2.58	
3,373.0	89.80	172.90	2,728.2	-882.8	182.5	890.1	4.17	-0.94	4.06	
3,404.0	89.80	173.10	2,728.3	-913.5	186.3	921.0	0.65	0.00	0.65	
3,436.0	89.40	174.80	2,728.6	-945.3	189.6	953.0	5.46	-1.25	5.31	
3,467.0	89.50	175.40	2,728.9	-976.2	192.3	983.9	1.96	0.32	1.94	
3,499.0	89.10	176.20	2,729.3	-1,008.1	194.6	1,015.9	2.79	-1.25	2.50	
3,531.0	89.10	177.40	2,729.8	-1,040.1	196.4	1,047.9	3.75	0.00	3.75	

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Design:	Wellbore #1	Database:	EDM 5000 1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
3,562.0	88.40	179.30	2,730.4	-1,071.1	197.3	1,078.9	6.53	-2.26	6.13	
3,594.0	88.40	179.90	2,731.3	-1,103.0	197.5	1,110.9	1.87	0.00	1.88	
3,625.0	88.20	179.80	2,732.3	-1,134.0	197.6	1,141.8	0.72	-0.65	-0.32	
3,657.0	88.50	181.80	2,733.2	-1,166.0	197.2	1,173.8	6.32	0.94	6.25	
3,689.0	89.20	183.90	2,733.8	-1,198.0	195.6	1,205.6	6.92	2.19	6.56	
3,720.0	89.70	184.90	2,734.1	-1,228.9	193.2	1,236.4	3.61	1.61	3.23	
3,751.0	90.00	184.10	2,734.2	-1,259.8	190.8	1,267.1	2.76	0.97	-2.58	
3,783.0	90.40	183.60	2,734.1	-1,291.7	188.6	1,298.9	2.00	1.25	-1.56	
3,814.0	90.70	183.60	2,733.8	-1,322.6	186.7	1,329.8	0.97	0.97	0.00	
3,846.0	91.00	182.60	2,733.3	-1,354.6	184.9	1,361.6	3.26	0.94	-3.13	
3,877.0	91.30	182.60	2,732.7	-1,385.6	183.5	1,392.5	0.97	0.97	0.00	
3,909.0	91.90	184.30	2,731.8	-1,417.5	181.6	1,424.3	5.63	1.88	5.31	
3,940.0	92.20	182.40	2,730.7	-1,448.4	179.8	1,455.1	6.20	0.97	-6.13	
3,972.0	91.60	183.30	2,729.6	-1,480.4	178.2	1,486.9	3.38	-1.88	2.81	
4,004.0	91.50	182.20	2,728.8	-1,512.3	176.7	1,518.8	3.45	-0.31	-3.44	
4,035.0	90.70	183.10	2,728.2	-1,543.3	175.2	1,549.6	3.88	-2.58	2.90	
4,066.0	90.80	181.50	2,727.8	-1,574.2	174.0	1,580.5	5.17	0.32	-5.16	
4,097.0	89.30	183.00	2,727.7	-1,605.2	172.8	1,611.4	6.84	-4.84	4.84	
4,129.0	88.90	183.50	2,728.2	-1,637.2	171.0	1,643.2	2.00	-1.25	1.56	
4,159.0	89.30	183.60	2,728.7	-1,667.1	169.1	1,673.0	1.37	1.33	0.33	
4,192.0	89.60	183.00	2,729.0	-1,700.0	167.2	1,705.9	2.03	0.91	-1.82	
4,223.0	90.40	183.40	2,729.0	-1,731.0	165.5	1,736.7	2.89	2.58	1.29	
4,253.0	89.60	181.60	2,729.0	-1,761.0	164.2	1,766.6	6.57	-2.67	-6.00	
4,285.0	90.00	183.10	2,729.1	-1,792.9	162.8	1,798.5	4.85	1.25	4.69	
4,316.0	90.20	181.30	2,729.1	-1,823.9	161.7	1,829.4	5.84	0.65	-5.81	
4,348.0	89.90	182.60	2,729.1	-1,855.9	160.6	1,861.3	4.17	-0.94	4.06	
4,378.0	89.90	182.40	2,729.1	-1,885.9	159.3	1,891.1	0.67	0.00	-0.67	
4,410.0	90.30	182.40	2,729.0	-1,917.8	157.9	1,923.0	1.25	1.25	0.00	
4,440.0	90.60	180.40	2,728.8	-1,947.8	157.2	1,952.9	6.74	1.00	-6.67	
4,471.0	90.50	181.70	2,728.5	-1,978.8	156.6	1,983.9	4.21	-0.32	4.19	
4,502.0	90.60	179.70	2,728.2	-2,009.8	156.2	2,014.8	6.46	0.32	-6.45	
4,534.0	90.20	179.80	2,728.0	-2,041.8	156.4	2,046.8	1.29	-1.25	0.31	
4,565.0	89.70	181.10	2,728.0	-2,072.8	156.1	2,077.8	4.49	-1.61	4.19	
4,597.0	89.10	181.70	2,728.4	-2,104.8	155.4	2,109.7	2.65	-1.88	1.88	
4,628.0	89.50	182.30	2,728.7	-2,135.8	154.3	2,140.6	2.33	1.29	1.94	
4,660.0	90.00	181.70	2,728.9	-2,167.7	153.2	2,172.5	2.44	1.56	-1.88	
4,723.0	90.00	182.50	2,728.9	-2,230.7	150.8	2,235.3	1.27	0.00	1.27	
4,754.0	90.10	181.40	2,728.8	-2,261.7	149.8	2,266.2	3.56	0.32	-3.55	
4,785.0	89.10	183.10	2,729.1	-2,292.7	148.6	2,297.0	6.36	-3.23	5.48	
4,816.0	89.10	183.80	2,729.6	-2,323.6	146.7	2,327.9	2.26	0.00	2.26	
4,847.0	89.10	182.30	2,730.0	-2,354.6	145.1	2,358.7	4.84	0.00	-4.84	
4,878.0	89.70	183.30	2,730.4	-2,385.5	143.5	2,389.6	3.76	1.94	3.23	
4,899.0	89.90	183.40	2,730.4	-2,406.5	142.3	2,410.5	1.06	0.95	0.48	
Projection to Bit										

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,952.0	89.90	183.40	2,730.5	-2,459.4	139.2	2,463.2	0.00	0.00	0.00

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,983.0	1,982.9	9.9	7.7	Tie-in to Gyro
3,071.3	2,726.8	-586.4	126.8	Crossed Hard Line @ 3071' MD
4,952.0	2,730.5	-2,459.4	139.2	Projection to Bit

Checked By: _____	Approved By: _____	Date: _____
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