



Murchison Oil and Gas

Paddock

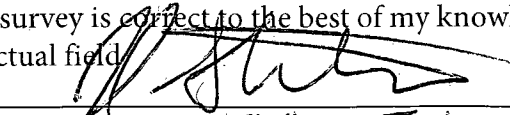
Vandiver #1H

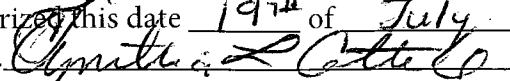
Survey: Vandiver #1

MOJO Standard Survey

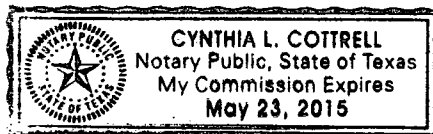
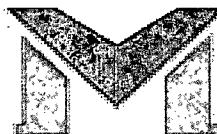
18 July, 2013

This survey is correct to the best of my knowledge and is supported
by actual field data.

 (Signature)

Notarized this date 19th of July,
2013.  Notary

Signature County of Collin State of Texas



30-015-40589

Company:	Murchison Oil and Gas	Local Co-ordinate Reference:	Well Vandiver #1H
Project:	Paddock	TVD Reference:	K.B. @ 3416.4usft
Site:	Vandiver #1H	MD Reference:	K.B. @ 3416.4usft
Well:	Vandiver #1H	North Reference:	Grid
Wellbore:	Vandiver #1H	Survey Calculation Method:	Minimum Curvature
Design:	Vandiver #1H	Database:	EDM 5000.1 Single User Db

Project	Paddock, Horizontal Development Wells		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		Using geodetic scale factor

Site	Vandiver #1H		
Site Position:	From: Lat/Long	Northing: 636,030.65 usft Easting: 517,233.07 usft Slot Radius: 13-3/16 "	Latitude: 32° 44' 54.458 N Longitude: 104° 24' 42.250 W Grid Convergence: -0.04 °
Position Uncertainty:	0.0 usft		

Well	Vandiver #1H		
Well Position	+N/-S 0.0 usft	Northing: 636,030.65 usft Easting: 517,233.07 usft Wellhead Elevation: usft	Latitude: 32° 44' 54.458 N Longitude: 104° 24' 42.250 W Ground Level: 3,404.4 usft
	+E/-W 0.0 usft		
Position Uncertainty	0.0 usft		

Wellbore	Vandiver #1H				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	IGRF200510	04/03/2013	(°) 7.79	(°) 60.51	(nT) 48,711

Design	Vandiver #1H			
Audit Notes:	Version: 1.0	Phase: ACTUAL	Tie On Depth: 0.0	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	87.63

Survey Program	Date 18/07/2013			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	6,885.0	Vandiver #1 (Vandiver #1H)	MWD	MWD - Standard

Company:	Murchison Oil and Gas	Local Co-ordinate Reference:	Well Vandiver #1H
Project:	Paddock	TVD Reference:	K.B. @ 3416.4usft
Site:	Vandiver #1H	MD Reference:	K.B. @ 3416.4usft
Well:	Vandiver #1H	North Reference:	Grid
Wellbore:	Vandiver #1H	Survey Calculation Method:	Minimum Curvature
Design:	Vandiver #1H	Database:	EDM 5000.1 Single User Db

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
0.0	0.00	0.00	0.0	-3,416.4	0.0	0.0	0.0	0.00	636,030.65	517,233.07	
100.0	0.59	351.59	100.0	-3,316.4	0.5	-0.1	-0.1	0.59	636,031.16	517,233.00	
120.0	0.49	351.93	120.0	-3,296.4	0.7	-0.1	-0.1	0.50	636,031.35	517,232.97	
14 "											
200.0	0.09	0.91	200.0	-3,216.4	1.1	-0.1	-0.1	0.50	636,031.75	517,232.92	
300.0	0.36	345.32	300.0	-3,116.4	1.5	-0.2	-0.2	0.27	636,032.13	517,232.84	
400.0	0.27	300.02	400.0	-3,016.4	1.9	-0.5	-0.4	0.26	636,032.55	517,232.56	
500.0	0.19	335.43	500.0	-2,916.4	2.2	-0.8	-0.7	0.16	636,032.82	517,232.29	
600.0	0.16	256.98	600.0	-2,816.4	2.3	-1.0	-0.9	0.22	636,032.94	517,232.08	
700.0	0.35	239.30	700.0	-2,716.4	2.1	-1.4	-1.3	0.20	636,032.75	517,231.68	
800.0	0.47	242.57	800.0	-2,616.4	1.8	-2.0	-1.9	0.12	636,032.41	517,231.06	
900.0	0.73	236.23	900.0	-2,516.4	1.2	-2.9	-2.9	0.27	636,031.87	517,230.16	
1,000.0	0.58	229.71	1,000.0	-2,416.4	0.5	-3.8	-3.8	0.17	636,031.18	517,229.25	
1,100.0	0.59	263.12	1,100.0	-2,316.4	0.1	-4.7	-4.7	0.34	636,030.80	517,228.35	
1,157.0	0.53	248.67	1,157.0	-2,259.4	0.0	-5.3	-5.3	0.27	636,030.66	517,227.81	
9 5/8"											
1,200.0	0.51	236.10	1,200.0	-2,216.4	-0.2	-5.6	-5.6	0.27	636,030.49	517,227.47	
1,300.0	0.64	238.16	1,300.0	-2,116.4	-0.7	-6.4	-6.5	0.13	636,029.94	517,226.63	
1,400.0	0.31	234.26	1,400.0	-2,016.4	-1.2	-7.1	-7.2	0.33	636,029.49	517,225.93	
1,460.0	0.26	154.24	1,460.0	-1,956.4	-1.4	-7.2	-7.3	0.61	636,029.27	517,225.86	
1,625.0	0.40	256.40	1,625.0	-1,791.4	-1.9	-7.6	-7.7	0.32	636,028.80	517,225.46	
1,688.0	0.30	283.10	1,688.0	-1,728.4	-1.9	-8.0	-8.1	0.30	636,028.79	517,225.09	
1,782.0	0.30	301.80	1,782.0	-1,634.4	-1.7	-8.4	-8.5	0.10	636,028.97	517,224.64	
1,814.0	0.30	282.60	1,814.0	-1,602.4	-1.6	-8.6	-8.6	0.31	636,029.03	517,224.49	
1,846.0	0.20	3.30	1,846.0	-1,570.4	-1.5	-8.7	-8.7	1.04	636,029.11	517,224.41	
1,877.0	1.70	59.50	1,876.9	-1,539.5	-1.3	-8.3	-8.3	5.15	636,029.39	517,224.81	
1,909.0	4.40	64.00	1,908.9	-1,507.5	-0.5	-6.8	-6.8	8.46	636,030.17	517,226.32	

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Well:	Vandiver #1H	North Reference:	Grid
Wellbore:	Vandiver #1H	Survey Calculation Method:	Minimum Curvature
Design:	Vandiver #1H	Database:	EDM 5000.1 Single User Db

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
1,940.0	7.20	64.10	1,939.7	-1,476.7	0.9	-3.9	-3.9	9.03	636,031.54	517,229.14	
1,972.0	10.10	62.40	1,971.4	-1,445.0	3.1	0.4	0.5	9.10	636,033.72	517,233.43	
2,003.0	12.80	62.70	2,001.8	-1,414.6	5.9	5.8	6.1	8.71	636,036.55	517,238.89	
2,035.0	15.80	63.40	2,032.8	-1,383.6	9.5	12.9	13.2	9.39	636,040.13	517,245.93	
2,066.0	18.90	63.80	2,062.3	-1,354.1	13.6	21.1	21.7	10.01	636,044.24	517,254.21	
2,097.0	21.70	64.00	2,091.4	-1,325.0	18.3	30.8	31.5	9.04	636,048.97	517,263.87	
2,123.0	23.40	65.30	2,115.4	-1,301.0	22.6	39.8	40.7	6.81	636,053.23	517,272.88	
2,154.0	26.50	66.60	2,143.5	-1,272.9	27.9	51.8	52.9	10.15	636,058.55	517,284.82	
2,186.0	30.80	66.80	2,171.6	-1,244.8	34.0	65.8	67.2	13.44	636,064.62	517,298.91	
2,217.0	35.30	67.30	2,197.6	-1,218.8	40.6	81.4	83.0	14.54	636,071.20	517,314.48	
2,249.0	39.80	68.60	2,222.9	-1,193.5	47.9	99.5	101.4	14.28	636,078.51	517,332.55	
2,251.7	40.13	68.62	2,225.0	-1,191.4	48.5	101.1	103.0	12.51	636,079.14	517,334.15	
Glorietta											
2,281.0	43.80	68.80	2,246.8	-1,169.6	55.6	119.4	121.6	12.51	636,086.26	517,352.42	
2,306.7	46.21	68.55	2,265.0	-1,151.4	62.2	136.3	138.8	9.38	636,092.88	517,369.37	
Paddock											
2,312.0	46.70	68.50	2,268.6	-1,147.8	63.6	139.9	142.4	9.38	636,094.27	517,372.92	
2,344.0	51.60	68.20	2,289.5	-1,126.9	72.6	162.3	165.2	15.33	636,103.20	517,395.40	
2,375.0	56.30	68.00	2,307.8	-1,108.6	81.9	185.6	188.8	15.17	636,112.55	517,418.65	
2,407.0	59.10	68.10	2,324.9	-1,091.5	92.0	210.7	214.3	8.75	636,122.65	517,443.73	
2,439.0	63.40	68.40	2,340.3	-1,076.1	102.4	236.7	240.8	13.46	636,133.05	517,469.78	
2,470.0	66.90	68.80	2,353.3	-1,063.1	112.7	262.9	267.4	11.35	636,143.31	517,495.97	
2,501.0	69.40	68.80	2,364.8	-1,051.6	123.1	289.7	294.6	8.06	636,153.71	517,522.79	
2,533.0	73.20	67.90	2,375.1	-1,041.3	134.3	317.9	323.2	12.17	636,164.89	517,550.95	
2,564.0	75.70	67.80	2,383.4	-1,033.0	145.5	345.6	351.3	8.07	636,176.15	517,578.61	
2,595.0	78.20	67.40	2,390.4	-1,026.0	157.0	373.5	379.7	8.16	636,187.66	517,606.52	
2,635.0	83.10	68.80	2,396.9	-1,019.5	171.7	410.1	416.8	12.73	636,202.37	517,643.13	

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Well:	Vandiver #1H	North Reference:	Grid
Wellbore:	Vandiver #1H	Survey Calculation Method:	Minimum Curvature
Design:	Vandiver #1H	Database:	EDM 5000.1 Single User Db

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
2,667.0	84.80	68.80	2,400.3	-1,016.1	183.2	439.8	447.0	5.31	636,213.87	517,672.79	
2,698.0	86.60	69.20	2,402.6	-1,013.8	194.3	468.6	476.3	5.95	636,224.95	517,701.65	
2,730.0	88.80	69.90	2,403.9	-1,012.5	205.5	498.6	506.6	7.21	636,236.12	517,731.60	
2,761.0	89.40	69.90	2,404.4	-1,012.0	216.1	527.7	536.2	1.94	636,246.77	517,760.71	
2,793.0	89.50	70.20	2,404.7	-1,011.7	227.1	557.8	566.7	0.99	636,257.69	517,790.79	
2,824.0	89.80	71.00	2,404.9	-1,011.5	237.4	587.0	596.3	2.76	636,267.98	517,820.02	
2,856.0	89.40	72.30	2,405.1	-1,011.3	247.4	617.4	627.1	4.25	636,278.06	517,850.39	
2,888.0	87.30	73.00	2,406.0	-1,010.4	257.0	647.9	658.0	6.92	636,287.59	517,880.92	
2,919.0	86.00	73.50	2,407.8	-1,008.6	265.9	677.5	688.0	4.49	636,296.51	517,910.55	
2,951.0	85.70	74.60	2,410.1	-1,006.3	274.7	708.2	719.0	3.55	636,305.28	517,941.23	
2,982.0	86.10	76.20	2,412.3	-1,004.1	282.4	738.1	749.2	5.31	636,313.07	517,971.15	
3,014.0	86.90	77.60	2,414.3	-1,002.1	289.7	769.3	780.6	5.03	636,320.31	518,002.26	
3,108.0	88.40	80.80	2,418.2	-998.2	307.3	861.5	873.5	3.76	636,337.91	518,094.49	
3,202.0	87.60	83.10	2,421.4	-995.0	320.4	954.5	966.9	2.59	636,351.06	518,187.49	
3,297.0	87.50	86.20	2,425.5	-990.9	329.3	1,049.0	1,061.7	3.26	636,359.91	518,281.97	
3,392.0	90.40	88.90	2,427.2	-989.2	333.3	1,143.9	1,156.7	4.17	636,363.97	518,376.84	
3,486.0	89.60	91.00	2,427.2	-989.2	333.4	1,237.9	1,250.6	2.39	636,364.05	518,470.83	
3,581.0	89.30	90.20	2,428.2	-988.2	332.4	1,332.9	1,345.5	0.90	636,363.05	518,565.81	
3,675.0	87.30	93.70	2,430.9	-985.5	329.2	1,426.7	1,439.1	4.29	636,359.86	518,659.68	
3,770.0	88.00	97.40	2,434.8	-981.6	320.1	1,521.2	1,533.1	3.96	636,350.68	518,754.13	
3,865.0	87.70	99.20	2,438.4	-978.0	306.4	1,615.1	1,626.4	1.92	636,336.98	518,848.06	
3,959.0	90.50	99.20	2,439.9	-976.5	291.3	1,707.9	1,718.5	2.98	636,321.95	518,940.82	
4,054.0	90.30	99.20	2,439.2	-977.2	276.1	1,801.7	1,811.6	0.21	636,306.77	519,034.59	
4,179.0	89.90	96.90	2,439.0	-977.4	258.6	1,925.4	1,934.5	1.87	636,289.26	519,158.34	
4,273.0	90.00	94.20	2,439.1	-977.3	249.5	2,019.0	2,027.6	2.87	636,280.18	519,251.88	
4,368.0	89.80	93.90	2,439.2	-977.2	242.8	2,113.8	2,122.0	0.38	636,273.47	519,346.63	
4,463.0	91.30	93.10	2,438.3	-978.1	237.0	2,208.6	2,216.5	1.79	636,267.67	519,441.44	

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

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
4,557.0	90.60	92.20	2,436.8	-979.6	232.7	2,302.5	2,310.1	1.21	636,263.32	519,535.32
4,652.0	87.90	91.90	2,438.0	-978.4	229.3	2,397.4	2,404.8	2.86	636,259.93	519,630.23
4,747.0	88.00	91.90	2,441.4	-975.0	226.1	2,492.3	2,499.5	0.11	636,256.78	519,725.11
4,841.0	87.90	91.50	2,444.8	-971.6	223.4	2,586.2	2,593.2	0.44	636,253.99	519,819.00
4,936.0	89.00	91.00	2,447.3	-969.1	221.3	2,681.1	2,688.0	1.27	636,251.92	519,913.93
5,030.0	90.40	91.50	2,447.8	-968.6	219.2	2,775.1	2,781.8	1.58	636,249.87	520,007.90
5,125.0	90.50	91.60	2,447.1	-969.3	216.7	2,870.0	2,876.5	0.15	636,247.30	520,102.85
5,219.0	90.20	91.30	2,446.5	-969.9	214.3	2,964.0	2,970.3	0.45	636,244.92	520,196.81
5,314.0	90.20	90.30	2,446.2	-970.2	213.0	3,059.0	3,065.2	1.05	636,243.60	520,291.79
5,363.0	90.10	90.40	2,446.1	-970.3	212.7	3,108.0	3,114.1	0.29	636,243.30	520,340.78
5,498.0	90.40	90.30	2,445.5	-970.9	211.8	3,243.0	3,249.0	0.23	636,242.47	520,475.77
5,593.0	89.40	88.40	2,445.6	-970.8	212.9	3,338.0	3,343.9	2.26	636,243.55	520,570.75
5,687.0	89.30	88.20	2,446.7	-969.7	215.7	3,431.9	3,437.9	0.24	636,246.34	520,664.69
5,782.0	88.80	87.20	2,448.3	-968.1	219.5	3,526.8	3,532.9	1.18	636,250.15	520,759.59
5,877.0	90.20	88.70	2,449.1	-967.3	222.9	3,621.8	3,627.9	2.16	636,253.55	520,854.51
5,971.0	92.50	90.50	2,446.9	-969.5	223.6	3,715.7	3,721.8	3.11	636,254.20	520,948.47
6,066.0	92.30	90.70	2,442.9	-973.5	222.6	3,810.6	3,816.6	0.30	636,253.21	521,043.37
6,161.0	92.30	90.20	2,439.1	-977.3	221.8	3,905.6	3,911.4	0.53	636,252.46	521,138.28
6,255.0	92.90	92.40	2,434.8	-981.6	219.7	3,999.4	4,005.1	2.42	636,250.33	521,232.15
6,350.0	91.20	92.00	2,431.4	-985.0	216.1	4,094.3	4,099.7	1.84	636,246.69	521,327.00
6,444.0	91.10	91.70	2,429.6	-986.8	213.0	4,188.2	4,193.5	0.34	636,243.66	521,420.93
6,539.0	90.60	93.40	2,428.1	-988.3	208.8	4,283.1	4,288.1	1.87	636,239.43	521,515.81
6,633.0	90.60	93.10	2,427.2	-989.2	203.5	4,377.0	4,381.6	0.32	636,234.10	521,609.64
6,728.0	90.40	92.60	2,426.3	-990.1	198.7	4,471.8	4,476.2	0.57	636,229.38	521,704.51
6,822.0	90.10	92.20	2,425.9	-990.5	194.8	4,565.8	4,569.9	0.53	636,225.44	521,798.42
6,883.0	90.10	92.20	2,425.8	-990.6	192.5	4,626.7	4,630.7	0.00	636,223.10	521,859.37

5 1/2"

Company:	Murchison Oil and Gas	Local Co-ordinate Reference:	Well Vandiver #1H
Project:	Paddock	TVD Reference:	K.B. @ 3416.4usft
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Well:	Vandiver #1H	North Reference:	Grid
Wellbore:	Vandiver #1H	Survey Calculation Method:	Minimum Curvature
Design:	Vandiver #1H	Database:	EDM 5000.1 Single User Db

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
6,885.0	90.10	92.20	2,425.8	-990.6	192.4	4,628.7	4,632.7	0.00	636,223.03	521,861.37
Projection to Bit										

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
120.0	120.0	14 "	14	17-1/2
1,157.0	1,157.0	9 5/8"	9-5/8	12-1/4
6,883.0	2,425.8	5 1/2"	5-1/2	6

Measured Depth (usft)	Vertical Depth (usft)	Name	Dip (°)
2,251.7	2,225.0	Glorietta	0.00
2,306.7	2,265.0	Paddock	0.00

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6,885.0	2,425.8	192.4	4,628.7	Projection to Bit

Checked By: _____ Approved By: _____ Date: _____