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ConocoPhillips MCBU - Permian-Panhandle Gold Data

Permian-BUCKEYE-NM East State Plane Zone

Vacuum - Field

VACUUM GLORIETA EAST UNIT 123H

3002542103

Original Hole

Design: Original Hole

Survey Report - Geographic

04 May, 2016

Provide signature page for survey

ConocoPhillips
Survey Report - Geographic

Company:	ConocoPhillips MCBU - Permian-Panhandle Gold Data	Local Co-ordinate Reference:	Well VACUUM GLORIETA EAST UNIT 123H
Project:	Permian-BUCKEYE-NM East State Plane Zone	TVD Reference:	RKB @ 3953.6usft (194)
Site:	Vacuum - Field	MD Reference:	RKB @ 3953.6usft (194)
Well:	VACUUM GLORIETA EAST UNIT 123H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Original Hole	Database:	EDM Central Planning

Project	Permian-BUCKEYE-NM East State Plane Zone, Permian Basin; State of New Mexico, Actual Survey Gold Data		
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		Using geodetic scale factor

Site		Vacuum - Field			
Site Position:		Northing:	0.00 usft	Latitude:	30° 59' 24.512 N
From:	Map	Easting:	0.00 usft	Longitude:	105° 55' 44.137 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.82 °

Well	VACUUM GLORIETA EAST UNIT 123H, Development - Horizontal					
Well Position	+N/-S	0.0 usft	Northing:	656,070.04 usft	Latitude:	32° 48' 1.894 N
	+E/-W	0.0 usft	Easting:	770,729.83 usft	Longitude:	103° 27' 8.173 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	3,939.1 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2015	10/10/2015	7.16	60.70	48,540

Design		Original Hole			
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	38.64	

Survey Program	Date	3/17/2016			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
151.4	1,597.7	Surface MWD Survey 1 (Original Hole)	GOOD GYRO	GOOD GYRO	
1,783.0	6,658.0	Final MWD Survey 2 (Original Hole)	MWD - OWSG R1	MWD - Standard OWSG	
6,758.0	8,934.0	Final MWD Survey 3 (Original Hole)	MWD - OWSG R1	MWD - Standard OWSG	

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	656,070.04	770,729.83	32° 48' 1.894 N	103° 27' 8.173 W
151.4	0.40	110.58	151.4	-0.2	0.5	656,069.86	770,730.32	32° 48' 1.892 N	103° 27' 8.167 W
209.7	0.34	125.47	209.7	-0.4	0.8	656,069.69	770,730.65	32° 48' 1.890 N	103° 27' 8.163 W
298.6	0.32	106.79	298.6	-0.6	1.3	656,069.46	770,731.11	32° 48' 1.888 N	103° 27' 8.158 W
359.1	0.30	98.05	359.1	-0.7	1.6	656,069.39	770,731.42	32° 48' 1.887 N	103° 27' 8.154 W
441.7	0.23	104.69	441.7	-0.7	2.0	656,069.32	770,731.80	32° 48' 1.886 N	103° 27' 8.150 W
471.7	0.31	97.30	471.7	-0.8	2.1	656,069.29	770,731.94	32° 48' 1.886 N	103° 27' 8.148 W
501.6	0.26	123.17	501.6	-0.8	2.2	656,069.25	770,732.07	32° 48' 1.885 N	103° 27' 8.146 W
533.5	0.19	144.28	533.5	-0.9	2.3	656,069.16	770,732.17	32° 48' 1.885 N	103° 27' 8.145 W

ConocoPhillips
Survey Report - Geographic

Company:	ConocoPhillips MCBU - Permian-Panhandle Gold Data	Local Co-ordinate Reference:	Well VACUUM GLORIETA EAST UNIT 123H
Project:	Permian-BUCKEYE-NM East State Plane Zone	TVD Reference:	RKB @ 3953.6usft (194)
Site:	Vacuum - Field	MD Reference:	RKB @ 3953.6usft (194)
Well:	VACUUM GLORIETA EAST UNIT 123H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Original Hole	Database:	EDM Central Planning

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
596.7	0.18	166.78	596.7	-1.1	2.4	656,068.98	770,732.25	32° 48' 1.883 N	103° 27' 8.144 W
642.0	0.25	189.29	642.0	-1.2	2.4	656,068.81	770,732.25	32° 48' 1.881 N	103° 27' 8.144 W
687.1	0.27	188.58	687.1	-1.4	2.4	656,068.61	770,732.22	32° 48' 1.879 N	103° 27' 8.145 W
732.2	0.28	198.60	732.2	-1.6	2.3	656,068.40	770,732.17	32° 48' 1.877 N	103° 27' 8.145 W
777.3	0.30	204.83	777.3	-1.9	2.3	656,068.19	770,732.08	32° 48' 1.875 N	103° 27' 8.146 W
822.5	0.24	203.53	822.5	-2.0	2.2	656,068.00	770,732.00	32° 48' 1.873 N	103° 27' 8.147 W
867.8	0.26	193.55	867.8	-2.2	2.1	656,067.81	770,731.93	32° 48' 1.871 N	103° 27' 8.148 W
958.2	0.30	185.32	958.2	-2.7	2.0	656,067.38	770,731.86	32° 48' 1.867 N	103° 27' 8.149 W
1,003.3	0.26	179.40	1,003.3	-2.9	2.0	656,067.16	770,731.85	32° 48' 1.865 N	103° 27' 8.149 W
1,048.4	0.23	180.36	1,048.4	-3.1	2.0	656,066.96	770,731.85	32° 48' 1.863 N	103° 27' 8.149 W
1,093.5	0.16	174.22	1,093.5	-3.2	2.0	656,066.81	770,731.86	32° 48' 1.861 N	103° 27' 8.149 W
1,183.9	0.12	140.28	1,183.9	-3.4	2.1	656,066.61	770,731.93	32° 48' 1.859 N	103° 27' 8.148 W
1,228.9	0.07	192.68	1,228.9	-3.5	2.1	656,066.55	770,731.96	32° 48' 1.859 N	103° 27' 8.148 W
1,274.0	0.08	193.51	1,274.0	-3.6	2.1	656,066.49	770,731.94	32° 48' 1.858 N	103° 27' 8.148 W
1,364.4	0.13	231.43	1,364.4	-3.7	2.0	656,066.37	770,731.85	32° 48' 1.857 N	103° 27' 8.149 W
1,409.5	0.12	269.02	1,409.5	-3.7	1.9	656,066.33	770,731.76	32° 48' 1.857 N	103° 27' 8.150 W
1,499.9	0.12	242.08	1,499.9	-3.8	1.8	656,066.29	770,731.58	32° 48' 1.856 N	103° 27' 8.152 W
1,545.2	0.13	270.64	1,545.2	-3.8	1.7	656,066.27	770,731.49	32° 48' 1.856 N	103° 27' 8.153 W
1,597.7	0.05	204.12	1,597.7	-3.8	1.6	656,066.24	770,731.42	32° 48' 1.856 N	103° 27' 8.154 W
1,783.0	0.50	187.00	1,783.0	-4.7	1.5	656,065.37	770,731.29	32° 48' 1.847 N	103° 27' 8.156 W
1,963.0	0.50	261.80	1,963.0	-5.6	0.6	656,064.48	770,730.42	32° 48' 1.838 N	103° 27' 8.166 W
2,142.0	0.20	256.10	2,142.0	-5.8	-0.5	656,064.29	770,729.34	32° 48' 1.837 N	103° 27' 8.179 W
2,321.0	0.30	129.76	2,321.0	-6.1	-0.4	656,063.92	770,729.40	32° 48' 1.833 N	103° 27' 8.178 W
2,500.0	0.40	91.60	2,500.0	-6.4	0.6	656,063.60	770,730.38	32° 48' 1.830 N	103° 27' 8.167 W
2,679.0	0.71	62.79	2,679.0	-6.0	2.2	656,064.09	770,731.99	32° 48' 1.834 N	103° 27' 8.148 W
2,858.0	0.80	75.70	2,857.9	-5.1	4.4	656,064.90	770,734.19	32° 48' 1.842 N	103° 27' 8.122 W
3,037.0	0.80	56.60	3,036.9	-4.1	6.6	656,065.90	770,736.44	32° 48' 1.852 N	103° 27' 8.095 W
3,216.0	0.80	26.60	3,215.9	-2.3	8.2	656,067.71	770,738.05	32° 48' 1.870 N	103° 27' 8.077 W
3,395.0	0.50	32.80	3,394.9	-0.6	9.2	656,069.48	770,739.03	32° 48' 1.887 N	103° 27' 8.065 W
3,574.0	0.62	11.57	3,573.9	1.0	9.8	656,071.08	770,739.65	32° 48' 1.903 N	103° 27' 8.057 W
3,753.0	0.60	344.00	3,752.9	2.9	9.8	656,072.93	770,739.58	32° 48' 1.921 N	103° 27' 8.058 W
3,932.0	0.50	337.00	3,931.9	4.5	9.2	656,074.55	770,739.02	32° 48' 1.937 N	103° 27' 8.064 W
4,111.0	0.60	294.90	4,110.9	5.6	8.0	656,075.67	770,737.86	32° 48' 1.949 N	103° 27' 8.078 W
4,270.0	0.80	332.90	4,269.9	7.0	6.8	656,077.01	770,736.60	32° 48' 1.962 N	103° 27' 8.093 W
4,449.0	0.80	332.40	4,448.8	9.2	5.6	656,079.23	770,735.45	32° 48' 1.984 N	103° 27' 8.106 W
4,628.0	1.20	338.10	4,627.8	12.0	4.3	656,082.07	770,734.18	32° 48' 2.012 N	103° 27' 8.120 W
4,807.0	1.02	343.80	4,806.8	15.3	3.2	656,085.34	770,733.03	32° 48' 2.045 N	103° 27' 8.134 W
4,985.0	1.19	33.69	4,984.7	18.4	3.8	656,088.40	770,733.62	32° 48' 2.075 N	103° 27' 8.126 W
5,030.0	2.78	55.37	5,029.7	19.4	4.9	656,089.41	770,734.77	32° 48' 2.085 N	103° 27' 8.113 W
5,075.0	4.68	53.70	5,074.6	21.1	7.3	656,091.12	770,737.15	32° 48' 2.101 N	103° 27' 8.085 W
5,119.0	7.20	37.66	5,118.4	24.3	10.5	656,094.36	770,740.28	32° 48' 2.133 N	103° 27' 8.048 W
5,164.0	9.90	34.40	5,162.9	29.7	14.4	656,099.79	770,744.19	32° 48' 2.187 N	103° 27' 8.001 W
5,209.0	13.08	35.28	5,207.0	37.1	19.5	656,107.14	770,749.32	32° 48' 2.259 N	103° 27' 7.941 W
5,254.0	16.31	37.97	5,250.5	46.2	26.3	656,116.28	770,756.15	32° 48' 2.349 N	103° 27' 7.860 W
5,298.0	18.12	42.59	5,292.5	56.1	34.8	656,126.19	770,764.58	32° 48' 2.446 N	103° 27' 7.760 W
5,343.0	20.28	44.27	5,335.0	66.9	44.9	656,136.93	770,774.76	32° 48' 2.552 N	103° 27' 7.640 W
5,388.0	22.80	46.47	5,376.9	78.5	56.7	656,148.52	770,786.53	32° 48' 2.665 N	103° 27' 7.501 W
5,433.0	25.72	48.50	5,417.9	91.0	70.3	656,161.00	770,800.17	32° 48' 2.788 N	103° 27' 7.340 W
5,477.0	28.99	46.47	5,457.0	104.6	85.2	656,174.67	770,815.05	32° 48' 2.922 N	103° 27' 7.164 W
5,522.0	32.39	45.59	5,495.7	120.6	101.7	656,190.62	770,831.58	32° 48' 3.078 N	103° 27' 6.969 W
5,567.0	35.62	45.59	5,533.0	138.2	119.7	656,208.23	770,849.55	32° 48' 3.251 N	103° 27' 6.757 W
5,612.0	37.52	43.70	5,569.1	157.3	138.6	656,227.31	770,868.38	32° 48' 3.438 N	103° 27' 6.534 W
5,656.0	39.51	41.18	5,603.5	177.5	157.0	656,247.53	770,886.86	32° 48' 3.637 N	103° 27' 6.316 W
5,701.0	41.89	39.38	5,637.6	199.9	176.0	656,269.92	770,905.82	32° 48' 3.857 N	103° 27' 6.091 W

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Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
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Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,746.0	44.72	38.58	5,670.4	223.9	195.4	656,293.92	770,925.23	32° 48' 4.092 N	103° 27' 5.862 W
5,791.0	47.42	39.07	5,701.6	249.1	215.7	656,319.16	770,945.54	32° 48' 4.341 N	103° 27' 5.621 W
5,836.0	49.80	38.58	5,731.4	275.4	236.9	656,345.46	770,966.71	32° 48' 4.599 N	103° 27' 5.371 W
5,880.0	52.41	38.98	5,759.0	302.1	258.3	656,372.15	770,988.15	32° 48' 4.861 N	103° 27' 5.117 W
5,925.0	54.79	39.07	5,785.7	330.2	281.1	656,400.29	771,010.96	32° 48' 5.138 N	103° 27' 4.847 W
5,970.0	57.58	39.29	5,810.7	359.2	304.8	656,429.27	771,034.58	32° 48' 5.423 N	103° 27' 4.567 W
6,015.0	59.92	37.39	5,834.1	389.4	328.6	656,459.44	771,058.43	32° 48' 5.719 N	103° 27' 4.285 W
6,058.0	62.80	36.30	5,854.7	419.6	351.2	656,489.64	771,081.06	32° 48' 6.016 N	103° 27' 4.017 W
6,103.0	64.80	35.70	5,874.5	452.3	375.0	656,522.31	771,104.79	32° 48' 6.337 N	103° 27' 3.736 W
6,148.0	66.80	35.70	5,893.0	485.6	398.9	656,555.64	771,128.74	32° 48' 6.665 N	103° 27' 3.452 W
6,192.0	69.50	36.40	5,909.4	518.6	422.9	656,588.65	771,152.77	32° 48' 6.990 N	103° 27' 3.167 W
6,230.0	70.90	36.60	5,922.2	547.3	444.2	656,617.39	771,174.04	32° 48' 7.272 N	103° 27' 2.915 W
6,282.0	71.10	37.10	5,939.2	586.7	473.7	656,656.73	771,203.52	32° 48' 7.659 N	103° 27' 2.566 W
6,326.0	71.20	36.60	5,953.4	620.0	498.7	656,690.05	771,228.49	32° 48' 7.987 N	103° 27' 2.270 W
6,368.0	71.30	36.80	5,966.9	651.9	522.4	656,721.94	771,252.26	32° 48' 8.300 N	103° 27' 1.989 W
6,416.0	71.30	36.60	5,982.3	688.4	549.6	656,758.39	771,279.43	32° 48' 8.659 N	103° 27' 1.667 W
6,461.0	72.60	36.80	5,996.2	722.7	575.2	656,792.70	771,305.00	32° 48' 8.996 N	103° 27' 1.364 W
6,506.0	75.00	37.40	6,008.8	757.1	601.2	656,827.16	771,331.07	32° 48' 9.335 N	103° 27' 1.055 W
6,550.0	77.40	38.00	6,019.3	790.9	627.4	656,860.96	771,357.20	32° 48' 9.667 N	103° 27' 0.746 W
6,595.0	81.10	39.60	6,027.7	825.4	655.1	656,895.41	771,384.90	32° 48' 10.006 N	103° 27' 0.418 W
6,640.0	83.50	39.80	6,033.7	859.7	683.6	656,929.72	771,413.38	32° 48' 10.343 N	103° 27' 0.081 W
6,658.0	84.40	40.20	6,035.6	873.4	695.1	656,943.43	771,424.89	32° 48' 10.478 N	103° 26' 59.945 W
6,758.0	88.30	39.80	6,042.0	949.8	759.2	657,019.86	771,489.02	32° 48' 11.229 N	103° 26' 59.186 W
6,848.0	88.40	40.30	6,044.5	1,018.7	817.1	657,088.73	771,546.91	32° 48' 11.905 N	103° 26' 58.501 W
6,939.0	88.00	39.00	6,047.4	1,088.7	875.1	657,158.76	771,604.94	32° 48' 12.593 N	103° 26' 57.814 W
7,030.0	88.30	39.60	6,050.3	1,159.1	932.7	657,229.14	771,662.55	32° 48' 13.285 N	103° 26' 57.133 W
7,121.0	89.50	38.80	6,052.1	1,229.6	990.2	657,299.64	771,720.05	32° 48' 13.978 N	103° 26' 56.452 W
7,211.0	90.20	37.30	6,052.3	1,300.5	1,045.7	657,370.51	771,775.52	32° 48' 14.674 N	103° 26' 55.795 W
7,302.0	90.60	39.40	6,051.7	1,371.8	1,102.2	657,441.87	771,831.98	32° 48' 15.376 N	103° 26' 55.127 W
7,393.0	90.40	42.90	6,050.9	1,440.3	1,162.0	657,510.38	771,891.85	32° 48' 16.049 N	103° 26' 54.419 W
7,483.0	84.40	41.90	6,055.0	1,506.7	1,222.6	657,576.74	771,952.44	32° 48' 16.700 N	103° 26' 53.702 W
7,574.0	83.50	41.50	6,064.6	1,574.3	1,282.8	657,644.30	772,012.64	32° 48' 17.364 N	103° 26' 52.991 W
7,665.0	83.30	41.70	6,075.0	1,641.9	1,342.8	657,711.90	772,072.66	32° 48' 18.028 N	103° 26' 52.281 W
7,755.0	83.80	39.20	6,085.1	1,709.9	1,400.9	657,779.95	772,130.67	32° 48' 18.696 N	103° 26' 51.594 W
7,846.0	83.40	38.80	6,095.3	1,780.2	1,457.8	657,850.23	772,187.58	32° 48' 19.387 N	103° 26' 50.921 W
7,937.0	85.20	36.60	6,104.3	1,851.8	1,513.1	657,921.87	772,242.95	32° 48' 20.091 N	103° 26' 50.265 W
8,028.0	87.00	32.50	6,110.5	1,926.6	1,564.6	657,996.63	772,294.42	32° 48' 20.826 N	103° 26' 49.655 W
8,118.0	87.30	31.60	6,115.0	2,002.8	1,612.3	658,072.81	772,342.12	32° 48' 21.576 N	103° 26' 49.089 W
8,209.0	89.30	33.90	6,117.7	2,079.3	1,661.5	658,149.31	772,391.32	32° 48' 22.329 N	103° 26' 48.505 W
8,300.0	89.50	33.30	6,118.6	2,155.1	1,711.9	658,225.10	772,441.68	32° 48' 23.075 N	103° 26' 47.907 W
8,391.0	90.40	37.00	6,118.7	2,229.5	1,764.2	658,299.49	772,494.06	32° 48' 23.806 N	103° 26' 47.286 W
8,481.0	89.40	37.70	6,118.9	2,301.0	1,818.8	658,371.03	772,548.66	32° 48' 24.510 N	103° 26' 46.640 W
8,572.0	88.80	37.40	6,120.3	2,373.1	1,874.3	658,443.17	772,604.11	32° 48' 25.219 N	103° 26' 45.983 W
8,663.0	88.90	36.10	6,122.1	2,446.0	1,928.7	658,516.06	772,658.55	32° 48' 25.936 N	103° 26' 45.338 W
8,753.0	89.50	37.70	6,123.4	2,518.0	1,982.8	658,588.03	772,712.58	32° 48' 26.643 N	103° 26' 44.698 W
8,844.0	89.90	37.00	6,123.9	2,590.3	2,038.0	658,660.36	772,767.78	32° 48' 27.354 N	103° 26' 44.044 W
8,934.0	89.90	37.50	6,124.0	2,662.0	2,092.4	658,732.00	772,822.26	32° 48' 28.059 N	103° 26' 43.399 W
9,000.0	89.90	37.50	6,124.1	2,714.3	2,132.6	658,784.36	772,862.44	32° 48' 28.573 N	103° 26' 42.923 W

ConocoPhillips
Survey Report - Geographic

Company:	ConocoPhillips MCBU - Permian-Panhandle Gold Data	Local Co-ordinate Reference:	Well VACUUM GLORIETA EAST UNIT 123H
Project:	Permian-BUCKEYE-NM East State Plane Zone	TVD Reference:	RKB @ 3953.6usft (194)
Site:	Vacuum - Field	MD Reference:	RKB @ 3953.6usft (194)
Well:	VACUUM GLORIETA EAST UNIT 123H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Original Hole	Database:	EDM Central Planning

Casing Points					
	Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
	1,640.0	1,640.0	9 5/8"	9-5/8	12-1/4
	6,704.5	6,039.4	7"	7	8-3/4

Checked By: _____	Approved By: _____	Date: _____
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