



**Reservoir Development**

Drilling & Measurements (Anadrill)

4301 SW 44th St

Oklahoma City, Oklahoma 73119 USA

Phone: (405) 682-2284

Fax: (405) 682-3937

30-015-41850

April 15, 2014

**CONFIDENTIAL**

Cimarex

600 N MARIENFELD STREET SUITE 600

MIDLAND, TX 79701

Re:

CLIENT: Cimarex Energy Co. of Colorado

WELL: Marquardt Federal 12H

FIELD: Bone Spring

RIG: Cactus 116

COUNTY: Eddy

API NO: 30-015-41850

JOB NO: 14MLD0076

S12-T25S-R26E 330 FSL 400 FEL  
N 32.13810 W 104.23925

Enclosed, please find the original copy of the survey performed on the referenced well by PathFinder, a division of Schlumberger Technology Corporation.

Other information required by your office is as follows.

<u>Name &amp; Title of Surveyor</u>	<u>Drainhole Number</u>	<u>Surveyed Depths</u>	<u>Dates Performed</u>	<u>Type of Survey</u>
Jacob Collinsworth MWD	Marquardt Federal 12H Original Hole	6502.00 Ft to 11537.00 Ft	April 4, 2014 to April 12, 2014	SlimPulse

If any other information is required, please contact the undersigned at the above letterhead and phone number.

Sincerely,

Jasem Alharer  
Field Service Manager

Reservoir Development  
Drilling & Measurements  
4301 SW 44th St  
Oklahoma City, Oklahoma 73119 USA  
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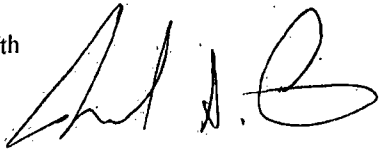
**PATHFINDER**  
A Schlumberger Company

Well Reference:

S12-T25S-R26E 330 FSL 400 FEL  
N 32.13810 W 104.23925

I, Jacob Collinsworth certify that; I am employed by PathFinder, a division of Schlumberger Technology Corporation; that I did on the day(s) of April 04, 2014 through April 12, 2014, conduct or supervise the taking of the SlimPulse surveys from a depth of 6502.00 feet to a depth of 11537.00 feet referenced to driller's depth; that the data is true, correct, complete and within the limitations of the tool as set forth by PathFinder, a division of Schlumberger Technology Corporation; that I am authorized and qualified to make this report; that this survey was conducted at the request of Cimarex Energy Co. of Colorado for the Marquardt Federal 12H Well (Original Hole) API No. 30-015-41850 and that I have reviewed this report and find that it conforms to the principals and procedures as set forth by Drilling & Measurements, a division of Schlumberger Technology Corporation.

By  
Jacob Collinsworth  
MWD



Subscribed and Sworn to before me this 15th day of April (month) 2014 (yr)

My Commission expires:

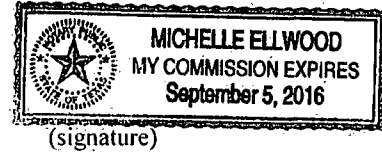
September 5, 2016

Michelle Ellwood

Notary Public

Midland, Tx

(County State)



SCHLUMBERGER  
Survey Report

2-May-2014

Client.....: Cimarex Energy Co.  
Field.....: Cottonwood Draw; B.S.

Well.....: Marquardt Federal 12H  
API number.....: 30-015-41850  
Engineer.....: J. Collinsworth

Spud date.....: 27-Mar-14  
Last survey date.....: 12-Apr-14  
Total accepted surveys...: 74  
MD of first survey.....: 6502.00 ft  
MD of last survey.....: 11537.00 ft

County.....: Eddy  
State.....: New Mexico  
Rig.....:

Latitude.....: 32° 8' 17.157" N  
Longitude.....: 104° 14' 21.293" W

----- Survey calculation methods-----  
Method for positions...: Minimum curvature  
Method for DLS.....: Lubinski

----- Depth reference -----  
Permanent datum.....: MSL  
Depth reference.....: Driller's Depth  
GL above permanent.....: 3225.00  
KB above permanent.....: 3243.00  
DF above permanent.....: 3243.00

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----- Vertical section origin-----  
Latitude (+N/S).....: 0.00 ft  
Departure (+E/W-).....: 0.00 ft

----- Grid Coordinates -----  
NAD27 Texas State Plane, Central Zone, US Feet  
X.....: 570458.94 ft  
Y.....: 413988.87 ft

Azimuth from Vsect Origin to target: 359.84 degrees

-----MWD Survey Reference Criteria-----

-----Run1----- Calculation Date: 4-Apr-2014  
Location G....: 998.81985 mgn Tolerance G...: 2.50 mgn  
Location B....: 48181.98 nT Tolerance B...: 300.00 nT  
Magnetic Dip: 59.90295 degrees Tolerance Dip: 0.45 degrees

-----Run2----- Calculation Date: 10-Apr-2014  
Location G....: 998.81985 mgn Tolerance G...: 2.50 mgn  
Location B....: 48180.08 nT Tolerance B...: 300.00 nT  
Magnetic Dip: 59.90247 degrees Tolerance Dip: 0.45 degrees

BGGM Model: 2013

-----Run1-----  
Magnetic dec (+E/W-).....: 7.66072 degrees  
Grid Conv (+E/W-).....: 0.05005 degrees  
Total Azim Corr (+E/W-)...: 7.61067 degrees

-----Run2-----  
Magnetic dec (+E/W-).....: 7.6589 degrees  
Grid Conv (+E/W-).....: 0.05005 degrees  
Total Azim Corr (+E/W-)...: 7.60885 degrees

-----Survey Correction Index Description-----

0 = Uncorrected 0 = Sag Corrected  
0 = DMAG Corrected 0 = Sag + DMAG Corrected

Seq	MD (ft)	Incl (deg)	Azim (deg)	Course (ft)	TVD (ft)	V Sec (ft)	N/-S (ft)	E/-W (ft)	Closure (ft)	at Azi (deg)	DLS (deg/100ft)	Tool	Correction
1	0.00	0.00	0.00	-999.25	0.00	0.00	0.00	0.00	0	90.00	0.00	TIP	0
2	81.00	0.79	7.47	81.00	81.00	0.55	0.55	0.07	0.55841	7.47	0.98	Other	0
3	142.00	0.79	187.60	61.00	142.00	0.55	0.55	0.07	0.55841	7.37	2.59	Other	0
4	193.00	1.01	211.20	51.00	192.99	-0.18	-0.18	-0.21	0.2743	229.22	0.84	Other	0
5	301.42	0.88	220.69	108.42	301.39	-1.62	-1.63	-1.25	2.04966	217.42	0.19	Other	0
6	356.00	0.79	344.31	54.58	355.97	-1.58	-1.58	-1.62	2.26567	225.66	2.70	Other	0
7	455.00	0.79	220.60	99.00	454.97	-1.44	-1.44	-2.25	2.67318	237.29	1.41	Other	0
8	516.00	0.88	221.40	61.00	515.96	-2.11	-2.12	-2.83	3.5353	233.25	0.15	Other	0
9	574.00	0.70	206.49	58.00	573.96	-2.76	-2.77	-3.29	4.29488	229.90	0.47	Other	0
10	667.00	0.79	205.31	93.00	666.95	-3.84	-3.85	-3.81	5.4216	224.69	0.10	Other	0



94	7223.00	69.48	359.74	31.00	7072.25	251.06	251.04	-7.62	251.15433	358.26	12.90	SlimPulse	0
95	7255.00	73.36	359.46	32.00	7082.45	281.38	281.36	-7.83	281.47286	358.41	12.16	SlimPulse	0
96	7286.00	76.74	0.93	31.00	7090.45	311.33	311.31	-7.72	311.40507	358.58	11.85	SlimPulse	0
97	7317.00	80.30	2.08	31.00	7096.61	341.69	341.67	-6.92	341.74354	358.84	12.05	SlimPulse	0
98	7349.00	82.37	3.27	32.00	7101.43	373.29	373.27	-5.44	373.31117	359.16	7.44	SlimPulse	0
99	7380.00	84.59	4.18	31.00	7104.95	404.01	404.00	-3.44	404.01838	359.51	7.73	SlimPulse	0
100	7410.00	86.49	5.32	30.00	7107.28	433.81	433.81	-0.96	433.80949	359.87	7.36	SlimPulse	0
101	7505.00	87.25	1.79	95.00	7112.47	528.45	528.47	4.91	528.49149	0.53	3.79	SlimPulse	0
102	7599.00	88.62	1.42	94.00	7115.86	622.34	622.37	7.55	622.41407	0.69	1.51	SlimPulse	0
103	7694.00	88.56	1.70	95.00	7118.20	717.27	717.30	10.14	717.37574	0.81	0.30	SlimPulse	0
104	7788.00	89.04	359.12	94.00	7120.17	811.24	811.27	10.81	811.34478	0.76	2.79	SlimPulse	0
105	7883.00	89.28	357.99	95.00	7121.57	906.20	906.23	8.41	906.26967	0.53	1.22	SlimPulse	0
106	7977.00	89.45	359.06	94.00	7122.61	1000.17	1000.19	5.99	1000.21008	0.34	1.16	SlimPulse	0
107	8071.00	89.38	359.56	94.00	7123.57	1094.16	1094.18	4.86	1094.19089	0.25	0.54	SlimPulse	0
108	8165.00	89.35	358.12	94.00	7124.62	1188.14	1188.15	2.95	1188.15616	0.14	1.53	SlimPulse	0
109	8258.00	89.45	359.12	93.00	7125.59	1281.11	1281.12	0.71	1281.11935	0.03	1.09	SlimPulse	0
110	8352.00	89.28	0.01	94.00	7126.64	1375.10	1375.11	0.00	1375.1097	360.00	0.97	SlimPulse	0
111	8445.00	89.45	359.64	93.00	7127.67	1468.10	1468.10	-0.28	1468.10337	359.99	0.44	SlimPulse	0
112	8538.00	89.35	0.08	93.00	7128.65	1561.09	1561.10	-0.50	1561.09779	359.98	0.49	SlimPulse	0
113	8632.00	89.42	358.52	94.00	7129.66	1655.08	1655.08	-1.65	1655.08317	359.94	1.66	SlimPulse	0
114	8729.00	89.42	358.77	97.00	7130.65	1752.05	1752.05	-3.94	1752.05453	359.87	0.25	SlimPulse	0
115	8823.00	89.55	358.66	94.00	7131.50	1846.03	1846.02	-6.05	1846.03239	359.81	0.19	SlimPulse	0
116	8918.00	89.48	358.91	95.00	7132.30	1941.01	1941.00	-8.08	1941.01429	359.76	0.27	SlimPulse	0
117	9013.00	89.52	359.29	95.00	7133.12	2036.00	2035.98	-9.57	2036.00443	359.73	0.41	SlimPulse	0
118	9105.00	89.93	358.62	92.00	7133.57	2127.99	2127.96	-11.25	2127.99462	359.70	0.85	SlimPulse	0
119	9203.00	89.45	358.83	98.00	7134.10	2225.97	2225.94	-13.43	2225.97939	359.65	0.53	SlimPulse	0
120	9297.00	89.90	357.81	94.00	7134.63	2319.93	2319.90	-16.18	2319.95193	359.60	1.18	SlimPulse	0
121	9392.00	90.00	358.95	95.00	7134.72	2414.90	2414.86	-18.87	2414.92968	359.55	1.21	SlimPulse	0
122	9487.00	90.34	1.34	95.00	7134.43	2509.89	2509.85	-18.62	2509.91727	359.57	2.54	SlimPulse	0
123	9581.00	90.52	1.43	94.00	7133.73	2603.85	2603.82	-16.35	2603.86932	359.64	0.20	SlimPulse	0
124	9676.00	90.48	0.73	95.00	7132.90	2698.83	2698.80	-14.55	2698.83616	359.69	0.73	SlimPulse	0
125	9770.00	90.17	1.66	94.00	7132.36	2792.80	2792.77	-12.59	2792.80218	359.74	1.04	SlimPulse	0
126	9864.00	90.55	1.95	94.00	7131.77	2886.74	2886.72	-9.63	2886.74102	359.81	0.51	SlimPulse	0
127	9959.00	90.34	1.74	95.00	7131.03	2981.68	2981.67	-6.57	2981.67982	359.87	0.31	SlimPulse	0
128	10053.00	90.14	0.56	94.00	7130.64	3075.65	3075.65	-4.68	3075.6546	359.91	1.27	SlimPulse	0
129	10149.00	89.93	359.81	96.00	7130.58	3171.65	3171.65	-4.36	3171.65277	359.92	0.82	SlimPulse	0
130	10243.00	90.10	0.09	94.00	7130.55	3265.65	3265.65	-4.45	3265.65263	359.92	0.35	SlimPulse	0
131	10333.00	89.93	358.58	90.00	7130.52	3355.64	3355.64	-5.50	3355.64538	359.91	1.69	SlimPulse	0
132	10426.00	90.24	357.93	93.00	7130.38	3448.61	3448.60	-8.33	3448.60716	359.86	0.77	SlimPulse	0
133	10521.00	90.45	357.17	95.00	7129.81	3543.53	3543.51	-12.38	3543.52962	359.80	0.83	SlimPulse	0
134	10616.00	90.28	356.46	95.00	7129.21	3638.39	3638.36	-17.66	3638.40154	359.72	0.77	SlimPulse	0
135	10710.00	90.17	356.23	94.00	7128.85	3732.22	3732.17	-23.66	3732.24137	359.64	0.27	SlimPulse	0
136	10802.00	89.83	356.17	92.00	7128.85	3824.03	3823.96	-29.76	3824.0795	359.55	0.38	SlimPulse	0
137	10898.00	89.79	358.22	96.00	7129.16	3919.92	3919.84	-34.45	3919.99454	359.50	2.14	SlimPulse	0
138	10993.00	89.76	0.10	95.00	7129.53	4014.91	4014.83	-35.84	4014.98799	359.49	1.98	SlimPulse	0
139	11088.00	89.72	1.84	95.00	7129.96	4109.89	4109.81	-34.23	4109.95223	359.52	1.84	SlimPulse	0
140	11182.00	89.86	3.20	94.00	7130.30	4203.78	4203.72	-30.10	4203.82364	359.59	1.45	SlimPulse	0
141	11279.00	89.66	2.17	97.00	7130.71	4300.66	4300.61	-25.56	4300.68337	359.66	1.08	SlimPulse	0
142	11373.00	89.59	1.15	94.00	7131.33	4394.61	4394.56	-22.83	4394.624	359.70	1.08	SlimPulse	0
143	11468.00	89.79	0.74	95.00	7131.84	4489.59	4489.55	-21.27	4489.60046	359.73	0.49	SlimPulse	0
144	11537.00	89.76	0.61	69.00	7132.11	4558.58	4558.54	-20.45	4558.59062	359.74	0.18	SlimPulse	0
145	11608.00	89.79	0.61	71.00	7132.39	4629.58	4629.54	-19.69	4629.58202	359.76	0.04	Other	7

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