

Reservoir Development

PathFinder, a Schlumberger Company
9200 West Reno Avenue
Oklahoma City, Oklahoma 73127 USA
Phone: (405) 789-1515
Fax: (405) 789-1519



November 6, 2014

Cimarex
600 N MARIENFELD STREET SUITE 600

MIDLAND ,TX 79701

Re:

S23-T23S-R32E 330 FNL 600 FEL
N 32.29659 W 103.63882

CLIENT: Cimarex Energy Co.
WELL: Diamondtail 23 Federal 8H
FIELD: Diamondtail; Bone Spring
RIG: Noram 26
COUNTY: Lea
API NO: 30-025-40783
JOB NO: 14MLD0367

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 & Title of Surveyor</u>	<u>Drainhole Number</u>	<u>Surveyed Depths</u>	<u>Dates Performed</u>	<u>Type of Survey</u>
Steven Durham MWD	Diamondtail 23 Federal 8H Original Hole	9187.00 Ft to 14192.00 Ft	October 12, 2014 to October 20, 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

APR 22 2015

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Well Reference:

S23-T23S-R32E 330 FNL 600 FEL
N 32.29659 W 103.63882

I, Steven Durham certify that; I am employed by PathFinder, a division of Schlumberger Technology Corporation; that I did on the day(s) of October 12, 2014 through October 20, 2014, conduct or supervise the taking of the SlimPulse surveys from a depth of 9187.00 feet to a depth of 14192.00 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. for the Diamondtail 23 Federal 8H Well (Original Hole) API No. 30-025-40783 and that I have reviewed this report and find that it conforms to the principals and procedures as set forth by PathFinder, a division of Schlumberger Technology Corporation.

By
Steven Durham
MWD

Subscribed and Sworn to before me this 6th day of November (month) 2014 (yr)

My Commission expires:

September 5, 2016



Michelle Ellwood

Notary Public

(signature)

Midland, TX
(County State)

SCHLUMBERGER
Survey Report

5-Nov-2014

Client.....: Cimarex Energy Co.
Field.....: Diamondtail; Bone Spring

Well.....: Diamondtail 23 Federal 8H
API number.....: 30-025-40783
Engineer.....: S.Durham

Spud date.....: 2-Oct-14
Last survey date.....: 20-Oct-14
Total accepted surveys....: 66
MD of first survey.....: 9187.00 ft
MD of last survey.....: 14192.00 ft

County.....: Lea
State.....: New Mexico
Rig.....: NorAm 26

Latitude.....: 32° 17' 47.74" N
Longitude.....: 103° 38' 19.74" 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.....: 3718.00
KB above permanent.....: 3743.00
DF above permanent.....: 3743.00

----- Vertical section origin-----

Latitude (+N/-).....: 0.00 ft
Departure (+E/-).....: 0.00 ft

----- Grid Coordinates -----

NAD27 Texas State Plane, Central Zone, US Feet
X.....: 472329.00 ft
Y.....: 755935.70 ft

Azimuth from Vsect Origin to target: 176.80 degrees

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

-----Run1----- Calculation Date: 12-Oct-2014
Location G.....: 998.32163 mgn Tolerance G.....: 2.50 mgn
Location B.....: 48449.08 nT Tolerance B.....: 300.00 nT
Magnetic Dip: 60.148 degrees Tolerance Dip: 0.45 degrees

-----Run2----- Calculation Date: 15-Oct-2014
Location G.....: 998.32163 mgn Tolerance G.....: 2.50 mgn
Location B.....: 48449.08 nT Tolerance B.....: 300.00 nT
Magnetic Dip: 60.148 degrees Tolerance Dip: 0.45 degrees

-----Run3----- Calculation Date: 18-Oct-2014
Location G.....: 998.32163 mgn Tolerance G.....: 2.50 mgn
Location B.....: 48449.08 nT Tolerance B.....: 300.00 nT
Magnetic Dip: 60.148 degrees Tolerance Dip: 0.45 degrees

HDGM Model: 2014

-----Run1-----
Magnetic dec (+E/-).....: 7.171 degrees
Grid Conv (+E/-).....: 0.371 degrees
Total Azim Corr (+E/-).....: 6.8 degrees

-----Run2-----
Magnetic dec (+E/-).....: 7.171 degrees
Grid Conv (+E/-).....: 0.371 degrees
Total Azim Corr (+E/-).....: 6.8 degrees

-----Run3-----
Magnetic dec (+E/-).....: 7.171 degrees
Grid Conv (+E/-).....: 0.371 degrees
Total Azim Corr (+E/-).....: 6.8 degrees

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

0 = Uncorrected 1 = Sag Corrected
2 = DMAG Corrected 3 = Sag + DMAG Corrected

===== Survey List =====
Seq MD Incl Azim Course TVD V Sec N/S E/W Closure at Azi DLS Tool Correction
(ft) (deg) (deg) (ft) (ft) (ft) (ft) (ft) (ft) (ft) (deg) (deg/100ft)

84	7904.00	0.48	188.11	93.00	7903.70	-15.10	15.04	-1.50	15.12	354.29	0.29	Other	0
85	7999.00	0.70	173.52	95.00	7998.69	-14.13	14.07	-1.49	14.15	353.94	0.28	Other	0
86	8093.00	0.79	180.42	94.00	8092.69	-12.91	12.85	-1.43	12.93	353.63	0.14	Other	0
87	8187.00	0.62	205.60	94.00	8186.68	-11.82	11.75	-1.66	11.86	351.96	0.37	Other	0
88	8281.00	0.79	205.99	94.00	8280.67	-10.81	10.71	-2.16	10.92	348.58	0.18	Other	0
89	8377.00	0.70	210.61	96.00	8376.66	-9.75	9.61	-2.75	9.99	344.02	0.11	Other	0
90	8470.00	1.01	203.49	93.00	8469.65	-8.54	8.37	-3.37	9.02	338.08	0.35	Other	0
91	8564.00	1.19	210.61	94.00	8563.64	-6.99	6.77	-4.19	7.96	328.21	0.24	Other	0
92	8660.00	1.49	229.51	96.00	8659.61	-5.41	5.10	-5.65	7.61	312.05	0.55	Other	0
93	8754.00	1.71	236.49	94.00	8753.57	-3.96	3.53	-7.75	8.52	294.49	0.31	Other	0
94	8848.00	1.71	233.42	94.00	8847.53	-2.48	1.92	-10.05	10.23	280.82	0.10	Other	0
95	8943.00	2.29	246.42	95.00	8942.47	-1.04	0.32	-12.92	12.93	271.40	0.77	Other	0
96	9038.00	2.20	244.62	95.00	9037.40	0.31	-1.22	-16.31	16.36	265.70	0.12	Other	0
97	9133.00	2.11	251.30	95.00	9132.33	1.47	-2.57	-19.61	19.78	262.54	0.28	Other	0
98	9140.18	2.11	255.21	7.18	9139.51	1.53	-2.64	-19.87	20.04	262.42	2.00	Other	0
99	9187.00	2.00	245.45	46.82	9186.30	2.00	-3.20	-21.44	21.68	261.51	0.78	SlimPulse	0
100	9239.00	4.84	198.24	52.00	9238.21	4.37	-5.66	-22.96	23.64	256.14	7.26	SlimPulse	0
101	9281.00	5.22	194.28	42.00	9280.05	7.84	-9.20	-23.98	25.68	249.02	1.23	SlimPulse	1
102	9312.00	8.77	175.34	31.00	9310.82	11.55	-12.92	-24.14	27.38	241.84	13.51	SlimPulse	1
103	9344.00	11.90	160.98	32.00	9342.30	17.17	-18.47	-22.86	29.39	231.06	12.60	SlimPulse	1
104	9375.00	14.20	146.25	31.00	9372.50	23.52	-24.66	-19.71	31.57	218.63	12.99	SlimPulse	1
105	9407.00	17.36	137.61	32.00	9403.30	30.60	-31.45	-14.31	34.55	204.46	10.56	SlimPulse	1
106	9438.00	20.63	138.11	31.00	9432.61	38.45	-38.93	-7.54	39.66	190.96	12.28	SlimPulse	1
107	9470.00	24.16	137.21	32.00	9462.19	47.90	-47.94	0.68	47.94	179.19	11.08	SlimPulse	1
108	9501.00	27.39	134.03	31.00	9490.10	58.03	-57.55	10.11	58.44	170.03	11.33	SlimPulse	1
109	9533.00	30.74	130.77	32.00	9518.07	69.11	-68.01	21.60	71.36	162.38	11.58	SlimPulse	1
110	9564.00	33.27	130.53	31.00	9544.35	80.49	-78.71	34.07	85.77	156.60	8.17	SlimPulse	1
111	9596.00	36.10	129.52	32.00	9570.67	92.96	-90.42	48.02	102.38	152.03	9.02	SlimPulse	1
112	9627.00	39.09	128.56	31.00	9595.23	105.67	-102.33	62.71	120.01	148.50	9.83	SlimPulse	1
113	9658.00	43.05	128.68	31.00	9618.59	119.25	-115.04	78.62	139.33	145.65	12.78	SlimPulse	1
114	9721.10	50.36	134.69	63.10	9661.85	151.71	-145.64	112.76	184.19	142.25	13.49	SlimPulse	1
115	9753.10	53.75	137.39	32.00	9681.53	170.82	-163.81	130.27	209.29	141.51	12.51	SlimPulse	1
116	9847.10	61.02	150.37	94.00	9732.32	237.22	-227.72	176.45	288.09	142.23	13.95	SlimPulse	1
117	9941.10	70.84	162.11	94.00	9770.72	317.41	-306.13	210.60	371.58	145.47	15.45	SlimPulse	1
118	10036.00	79.60	173.82	94.90	9794.98	407.84	-395.65	229.49	457.39	149.88	15.07	SlimPulse	1
119	10067.00	81.49	178.20	31.00	9800.08	438.41	-426.14	231.62	485.02	151.48	15.21	SlimPulse	1
120	10130.00	81.80	178.70	63.00	9809.23	500.71	-488.45	233.30	541.31	154.47	0.33	SlimPulse	1
121	10225.00	87.29	180.56	95.00	9818.26	595.13	-582.98	233.91	628.15	158.14	6.10	SlimPulse	1
122	10251.00	87.97	181.01	26.00	9819.34	621.04	-608.96	233.55	652.21	159.02	3.14	SlimPulse	0
123	10346.00	90.07	180.31	95.00	9820.96	715.81	-703.93	232.46	741.32	161.73	2.43	SlimPulse	0
124	10440.00	91.34	180.06	94.00	9819.81	809.63	-797.92	232.16	831.01	163.78	1.38	SlimPulse	0
125	10535.00	90.41	180.08	95.00	9817.99	904.47	-892.91	232.04	922.56	165.43	0.86	SlimPulse	0
126	10629.00	90.03	180.88	94.00	9816.35	998.27	-986.90	231.25	1013.63	166.81	0.94	SlimPulse	0
127	10724.00	88.59	180.03	95.00	9819.13	1093.07	-1081.89	230.48	1106.17	167.97	1.76	SlimPulse	0
128	10812.00	89.72	180.22	94.00	1186.90	1186.90	-1175.88	230.28	1198.21	168.92	1.22	SlimPulse	0
129	10912.00	89.66	181.21	94.00	9821.02	1280.68	-1269.87	229.11	1290.37	169.77	1.06	SlimPulse	0
130	11006.00	89.17	182.81	94.00	9821.98	1374.28	-1363.80	225.82	1382.37	170.60	1.78	SlimPulse	0
131	11101.00	89.14	180.21	95.00	9823.38	1468.94	-1458.75	223.32	1475.74	171.30	2.74	SlimPulse	0
132	11195.00	89.59	178.92	94.00	9824.42	1562.82	-1552.74	224.03	1568.82	171.79	1.45	SlimPulse	0
133	11289.00	89.42	178.56	94.00	9825.24	1656.77	-1646.71	226.10	1662.16	172.18	0.43	SlimPulse	0
134	11384.00	89.55	178.28	95.00	9826.10	1751.72	-1741.67	228.72	1756.63	172.52	0.33	SlimPulse	0
135	11478.00	88.11	177.75	94.00	9828.02	1845.68	-1835.59	231.98	1850.19	172.80	1.64	SlimPulse	0
136	11573.00	88.14	177.64	95.00	9831.12	1940.62	-1930.47	235.80	1944.81	173.04	0.12	SlimPulse	0
137	11667.00	87.42	177.67	94.00	9834.77	2034.54	-2024.32	239.65	2038.45	173.25	0.77	SlimPulse	0
138	11762.00	87.52	177.72	95.00	9838.96	2129.43	-2119.15	243.46	2133.09	173.45	0.12	SlimPulse	0
139	11856.00	87.35	178.07	94.00	9843.17	2223.32	-2212.99	246.91	2226.72	173.63	0.41	SlimPulse	0
140	11951.00	87.01	177.98	95.00	9847.84	2318.18	-2307.82	250.18	2321.34	173.81	0.37	SlimPulse	0
141	12045.00	87.38	178.27	94.00	9852.44	2412.05	-2401.65	253.25	2414.97	173.98	0.50	SlimPulse	0
142	12140.00	86.91	177.04	95.00	9857.18	2506.92	-2496.45	257.13	2509.66	174.12	1.39	SlimPulse	0
143	12234.00	89.72	176.50	94.00	9859.94	2600.87	-2590.25	262.43	2603.51	174.21	3.05	SlimPulse	0
144	12232.00	89.59	175.70	95.00	9860.51	2695.86	-2685.03	268.89	2698.46	174.28	0.55	SlimPulse	0
145	12423.00	89.90	175.63	94.00	9860.93	2789.84	-2778.76	275.99	2792.43	174.33	0.34	SlimPulse	0
146	12517.00	90.34	175.40	94.00	9860.74	2883.81	-2872.47	283.34	2886.41	174.37	0.53	SlimPulse	0
147	12612.00	91.72	176.41	95.00	9869.02	2978.78	-2967.21	290.13	2981.36	174.42	1.79	SlimPulse	0
148	12707.00	90.65	179.06	95.00	9857.06	3073.74	-3062.11	293.89	3076.18	174.52	3.01	SlimPulse	0
149	12801.00	91.48	180.43	94.00	9855.31	3167.60	-3156.09	294.31	3169.78	174.67	1.70	SlimPulse	0
150	12896.00	91.86	181.78	95.00	9852.54	3262.28	-3251.03	292.48	3264.16	174.86	1.48	SlimPulse	0
151	12990.00	91.27	181.65	94.00	9849.97	3355.90	-3344.95	289.67	3357.47	175.05	0.64	SlimPulse	0
152	13085.00	91.14	182.30	95.00	9846.98	3450.49	-3439.87	286.39	3451.77	175.24	0.70	SlimPulse	0
153	13179.00	90.45	182.45	94.00	9846.68	3544.04	-3533.78	282.50	3545.06	175.43	0.75	SlimPulse	0
154	13373.00	91.13	182.55	94.00	9845.38	3637.57	-3627.68	278.39	3638.35	175.61	0.74	SlimPulse	0
155	13368.00	91.34	184.36	95.00	9843.33	3731.90	-3722.48	272.66	3732.46	175.81	1.92	SlimPulse	0
156	13463.00	91.96	184.55	95.00	9840.59	3826.01	-3817.16	265.28	3826.36	176.02	0.68	SlimPulse	0
157	13557.00	92.78	184.06	94.00	9836.70	3919.13	-3910.81	258.23	3919.33	176.22	1.02	SlimPulse	0
158	13652.00	93.41	183.47	95.00	9831.57	4013.29	-4005.47	252.01	4013.39	176.40	0.90	SlimPulse	0
159	13746.00	93.61	183.84	94.00	9825.82	4106.44	-4099.10	246.02	4106.47	176.57	0.45	SlimPulse	0
160	13841.00	93.82	183.62	95.00	9819.66	4200.55	-4199.70	239.86	4200.55	176.73	0.32	SlimPulse	0
161	13936.00	95.10	183.13	95.00	9812.27	4294.64	-4288.24	234.29	4294.64	176.87	1.44	SlimPulse	0
162	14032.00	95.30	182.29	96.00	9803.57	4389.73	-4383.78	229.77	4389.76	177.00	0.89	SlimPulse	0
163	14127.00	96.20	182.31	95.00	9794.05	4483.82	-4478.18	225.97	4483.88	177.11	0.94	SlimPulse	0
164	14192.00	96.37	182.04	65.00	9786.93	4548.14	-4542.75	223.52	4548.24	177.18	0.49	SlimPulse	0
165	14264.00	96.37	182.04	72.00	9778.94	4619.40	-4614.26	220.97	4619.55	177.26	0.01	Prof. to Bit	7