

Oilfield Services, Central U.S. Land

Reservoir Development

PathFinder, a Schlumberger Company

9200 West Reno Avenue

Oklahoma City, Oklahoma 73127 USA

Phone: (405) 789-1515

Fax: (405) 789-1519



15 42160

October 15, 2014

Cimarex

600 N MARIENFELD STREET SUITE 600

MIDLAND, TX 79701

NM OIL CONSERVATION

ARTESIA DISTRICT

FEB 23 2015

RECEIVED

Re:

CLIENT: Cimarex Energy Co.

WELL: White City 8 Federal 3H

FIELD: Cottonwood Draw; B.S.

RIG: Cactus116

COUNTY: Eddy

API NO: 30-015-42160

JOB NO: 14MLD0502

Sec 8, T25S, R27E Eddy NM
N 32.13823 W 104.21435

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>
John Gilchrist MWD	White City 8 Federal 3H Original Hole	6653.00 Ft to 11731.00 Ft	July 27, 2014 to August 1, 2014	SlimPulse

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

Sincerely,

Joseph Hogan
Field Service Manager

Reservoir Development

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

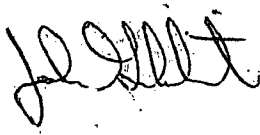
PATHFINDER
A Schlumberger Company

Well Reference:

Sec 8, T25S, R27E Eddy NM
N 32.13823 W 104.21435

I, John Gilchrist certify that; I am employed by PathFinder, a division of Schlumberger Technology Corporation; that I did on the day(s) of July 27, 2014 through August 01, 2014, conduct or supervise the taking of the SlimPulse surveys from a depth of 6653.00 feet to a depth of 11731.00 feet referenced to driller's depth; that the data is true, correct, complete and within the limitations of the tool as set forth by Drilling & Measurements, 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 White City 8 Federal 3H Well (Original Hole) API No. 30-015-42160 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.

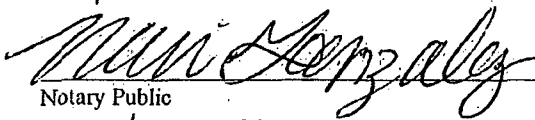
By
John Gilchrist
MWD

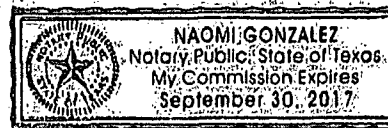


Subscribed and Sworn to before me this 2nd day of AUG (month) 2014 (yr)

My Commission expires:

Sept. 30. 2017

 Naomi Gonzalez (signature)
Notary Public
Ector TX
(County State)



SCHLUMBERGER
Survey Report

15-Oct-2014

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

Well..... White City 8 Federal #3H
API number..... 30-015-42160
Engineer..... John Gilchrist

Spud date..... 18-Jul-14
Last survey date..... 1-Aug-14
Total accepted surveys..... 62
MD of first survey..... 6653.00 ft
MD of last survey..... 11731.00 ft

County..... Eddy
State..... New Mexico
Rig..... Cactus 116

Latitude..... 32° 8' 17.622" N
Longitude..... 104° 12' 51.675" 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..... 3220.00
KB above permanent..... 3238.00
DF above permanent..... 3238.00

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

----- Grid Coordinates -----
NAD27 Texas State Plane, Central Zone, US Feet
X..... 414043.50 ft
Y..... 578164.20 ft

Azimuth from Vsect Origin to target: 359.15 degrees

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

-----Run1----- Calculation Date: 27-Jul-2014
Location G..... 998.94325 mgn Tolerance G..... 2.50 mgn
Location B..... 48139.22 nT Tolerance B..... 300.00 nT
Magnetic Dip: 59.9077 degrees Tolerance Dip: 0.45 degrees

-----Run2----- Calculation Date: 8-May-2011
Location G..... 998.63244 mgn Tolerance G..... 2.50 mgn
Location B..... 48286.4 nT Tolerance B..... 300.00 nT
Magnetic Dip: 59.61 degrees Tolerance Dip: 0.45 degrees

-----Run3----- Calculation Date: 8-May-2011
Location G..... 998.63244 mgn Tolerance G..... 2.50 mgn
Location B..... 48286.4 nT Tolerance B..... 300.00 nT
Magnetic Dip: 59.61 degrees Tolerance Dip: 0.45 degrees

BGGM Model: 2014

-----Run1-----
Magnetic dec (+E/-)..... 7.6555 degrees
Grid Conv (+E/-)..... 0.0655 degrees
Total Azim Corr (+E/-)..... 7.59 degrees

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

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

===== Survey List =====													
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	89.00	0.31	38.82	89.00	89.00	0.19	0.19	0.15	0.24	38.82	0.35	Other	0
3	119.00	0.40	9.03	30.00	119.00	0.35	0.35	0.22	0.42	31.64	0.67	Other	0
4	179.00	0.40	7.71	60.00	179.00	0.76	0.77	0.28	0.82	19.96	0.02	Other	0
5	272.00	0.40	2.21	93.00	272.00	1.41	1.41	0.34	1.45	13.33	0.04	Other	0
6	328.00	0.48	6.21	56.00	327.99	1.84	1.84	0.37	1.88	11.30	0.15	Other	0
7	380.00	1.10	5.33	52.00	379.99	2.55	2.56	0.44	2.59	9.72	1.19	Other	0
8	402.00	1.10	358.70	22.00	401.98	2.97	2.98	0.45	3.01	8.65	0.58	Other	0
9	471.00	1.41	10.83	69.00	470.97	4.46	4.47	0.60	4.51	7.61	0.59	Other	0
10	523.00	1.41	0.11	52.00	522.95	5.73	5.74	0.72	5.79	7.14	0.51	Other	0

11	573.00	2.02	359.40	50.00	572.93	7.23	7.24	0.71	7.27	5.61	1.22	Other	0
12	649.00	1.32	0.81	76.00	648.90	9.44	9.45	0.71	9.48	4.29	0.92	Other	0
13	678.00	1.41	1.82	29.00	677.89	10.13	10.14	0.73	10.17	4.09	0.32	Other	0
14	738.00	1.49	10.43	60.00	737.87	11.63	11.65	0.89	11.68	4.37	0.39	Other	0
15	829.00	1.49	7.71	91.00	828.84	13.96	13.98	1.26	14.04	5.16	0.08	Other	0
16	921.00	1.58	11.31	92.00	920.81	16.39	16.41	1.67	16.5	5.82	0.14	Other	0
17	1015.00	1.89	8.63	94.00	1014.76	19.18	19.22	2.16	19.34	6.41	0.34	Other	0
18	1105.00	2.02	9.91	91.00	1105.71	22.24	22.28	2.66	22.44	6.81	0.15	Other	0
19	1195.00	1.01	22.21	89.00	1194.68	24.50	24.55	3.23	24.76	7.49	1.19	Other	0
20	1293.00	0.79	54.20	98.00	1292.67	25.68	25.75	4.10	26.07	9.05	0.55	Other	0
21	1390.00	1.32	60.84	87.00	1389.65	26.50	26.59	5.46	27.14	11.61	0.62	Other	0
22	1474.00	1.49	71.43	94.00	1473.62	27.39	27.50	7.57	28.52	15.38	0.33	Other	0
23	1568.00	1.80	70.20	94.00	1567.58	28.24	28.39	10.11	30.14	19.61	0.33	Other	0
24	1664.00	0.79	72.22	96.00	1663.56	28.92	29.10	12.16	31.54	22.68	1.05	Other	0
25	1759.00	1.10	93.23	95.00	1758.55	29.05	29.25	13.70	32.3	25.09	0.48	Other	0
26	1853.00	1.41	89.53	94.00	1852.52	28.98	29.21	15.75	33.19	28.34	0.34	Other	0
27	1944.00	1.32	97.62	91.00	1943.50	28.81	29.08	17.91	34.16	31.63	0.23	Other	0
28	1986.00	1.19	93.53	42.00	1985.49	28.71	28.99	18.83	34.57	33.00	0.38	Other	0
29	2132.00	0.79	91.03	146.00	2131.46	28.56	28.88	21.35	35.91	36.47	0.28	Other	0
30	2228.00	0.70	94.41	96.00	2227.46	28.48	28.82	23.76	37.36	39.50	0.12	Other	0
31	2324.00	0.70	84.83	96.00	2323.45	28.48	28.83	26.52	39.38	47.54	1.57	Other	0
32	2418.00	0.79	85.40	94.00	2417.44	28.56	28.93	24.98	38.23	40.80	0.10	Other	0
33	2513.00	0.88	78.24	95.00	2512.43	28.74	29.14	26.35	39.28	42.12	0.14	Other	0
34	2607.00	0.62	238.33	94.00	2606.43	28.62	29.02	26.62	39.38	47.54	1.57	Other	0
35	2703.00	0.88	240.53	96.00	2702.42	28.00	28.38	25.54	38.18	41.98	0.27	Other	0
36	2797.00	1.01	239.74	94.00	2796.41	27.25	27.61	24.19	36.71	41.23	0.14	Other	0
37	2891.00	0.88	236.31	94.00	2890.39	26.45	26.79	22.88	35.23	40.49	0.15	Other	0
38	2985.00	0.79	238.90	94.00	2984.38	25.73	26.05	21.72	33.92	39.82	0.10	Other	0
39	3081.00	0.88	231.83	96.00	3080.37	24.95	25.26	20.57	32.58	39.17	0.14	Other	0
40	3176.00	0.88	232.53	95.00	3175.36	24.07	24.36	19.42	31.16	38.56	0.01	Other	0
41	3270.00	0.88	239.21	94.00	3269.35	23.28	23.55	18.23	29.78	37.74	0.11	Other	0
42	3366.00	0.79	237.23	96.00	3365.34	22.56	22.82	17.04	28.48	36.75	0.10	Other	0
43	3461.00	0.62	224.14	95.00	3460.33	21.85	22.10	16.13	27.36	36.13	0.25	Other	0
44	3555.00	0.62	216.54	94.00	3554.33	21.09	21.32	15.47	26.34	35.97	0.09	Other	0
45	3650.00	0.62	201.51	95.00	3649.32	20.21	20.43	14.98	25.33	36.25	0.17	Other	0
46	3744.00	0.62	213.81	94.00	3743.32	19.32	19.53	14.51	24.33	36.60	0.14	Other	0
47	3838.00	0.62	206.03	94.00	3837.31	18.45	18.66	14.00	23.33	36.89	0.09	Other	0
48	3935.00	0.70	200.94	97.00	3934.31	17.43	17.63	13.56	22.24	37.57	0.10	Other	0
49	4030.00	0.79	194.21	95.00	4029.30	16.26	16.45	13.19	21.09	38.73	0.13	Other	0
50	4124.00	0.70	200.41	94.00	4123.29	15.10	15.29	12.83	19.96	40.02	0.13	Other	0
51	4219.00	0.70	205.73	95.00	4218.28	14.04	14.22	12.38	18.85	41.04	0.07	Other	0
52	4313.00	0.62	210.12	94.00	4312.28	13.09	13.26	11.88	17.8	41.84	0.10	Other	0
53	4407.00	0.62	207.83	94.00	4406.27	12.20	12.37	11.38	16.81	42.61	0.03	Other	0
54	4501.00	0.48	210.74	94.00	4500.27	11.42	11.59	10.94	15.94	43.37	0.15	Other	0
55	4596.00	0.62	195.62	95.00	4595.26	10.59	10.75	10.60	15.1	44.61	0.21	Other	0
56	4690.00	0.79	200.54	94.00	4689.26	9.50	9.65	10.24	14.07	46.69	0.19	Other	0
57	4782.00	0.88	190.83	92.00	4781.25	8.22	8.36	9.88	12.95	49.76	0.18	Other	0
58	4880.00	1.01	195.93	98.00	4879.23	5.01	5.15	9.10	11.68	54.44	0.16	Other	0
59	4976.00	1.01	189.20	96.00	4975.22	5.01	5.15	9.54	10.49	60.61	0.12	Other	0
60	5071.00	1.19	195.22	95.00	5070.20	3.24	3.37	8.74	9.37	68.94	0.22	Other	0
61	5165.00	1.32	199.70	94.00	5164.18	1.29	1.41	8.12	8.24	80.18	0.17	Other	0
62	5260.00	1.41	198.83	95.00	5259.15	-0.84	-0.73	7.38	7.41	95.66	0.10	Other	0
63	5355.00	1.58	194.52	95.00	5354.12	-3.20	-3.10	6.67	7.36	114.96	0.21	Other	0
64	5450.00	1.49	194.61	95.00	5449.08	-5.66	-5.57	6.03	8.21	132.71	0.09	Other	0
65	5543.00	1.41	195.93	93.00	5542.05	-7.92	-7.84	5.41	9.53	145.38	0.09	Other	0
66	5639.00	1.01	190.30	96.00	5638.03	-9.88	-9.81	4.94	10.98	153.28	0.43	Other	0
67	5734.00	1.19	199.00	95.00	5733.02	-11.63	-11.56	4.47	12.4	158.88	0.26	Other	0
68	5827.00	1.01	204.54	93.00	5826.00	-13.28	-13.22	3.81	13.76	163.92	0.22	Other	0
69	5921.00	1.10	182.13	95.00	5920.98	-14.94	-14.89	3.43	15.28	167.03	0.44	Other	0
70	6016.00	0.22	319.50	94.00	6014.98	-15.71	-15.66	3.28	16	168.17	1.35	Other	0
71	6109.00	0.62	38.03	93.00	6107.98	-15.18	-15.13	3.47	15.52	167.07	0.66	Other	0
72	6205.00	0.22	183.84	96.00	6203.97	-14.96	-14.90	3.78	15.37	165.77	0.85	Other	0
73	6298.00	0.40	264.52	96.00	6296.97	-15.16	-15.11	3.45	15.5	167.16	0.46	Other	0
74	6394.00	0.70	231.04	95.00	6392.97	-15.55	-15.51	2.66	15.74	170.29	0.45	Other	0
75	6488.00	0.79	238.51	94.00	6486.96	-16.23	-16.21	1.66	16.3	174.17	0.14	Other	0
76	6583.00	1.01	235.04	95.00	6581.95	-17.04	-17.03	0.41	17.04	178.62	0.24	Other	0
77	6619.00	1.19	234.64	96.00	6617.94	-17.43	-17.43	-0.15	17.43	180.50	0.50	Other	0
78	6653.00	1.28	243.36	94.00	6651.93	-17.79	-17.81	-0.78	17.82	182.51	0.62	SlimPulse	0
79	6747.00	0.57	327.59	94.00	6745.92	-17.85	-17.88	-1.98	17.99	186.30	1.44	SlimPulse	0
80	6780.00	3.51	15.39	33.00	6778.90	-16.74	-16.77	-1.80	16.86	186.11	9.56	SlimPulse	0
81	6841.00	9.37	13.81	61.00	6839.49	-10.14	-10.14	-0.11	10.14	180.64	9.60	SlimPulse	0
82	6936.00	14.25	0.44	95.00	6932.47	9.04	9.07	1.82	9.25	11.36	5.86	SlimPulse	0
83	6969.00	17.03	356.70	93.00	6964.24	17.93	17.96	1.57	18.02	5.01	8.96	SlimPulse	0
84	7000.00	19.06	353.77	31.00	6993.72	27.51	27.52	0.76	27.53	1.59	7.18	SlimPulse	0
85	7031.00	21.88	352.20	32.00	7023.70	38.63	38.63	-0.61	38.63	359.09	8.97	SlimPulse	0
86	7063.00	25.66	351.41	31.00	7052.06	51.02	50.99	-2.40	51.05	357.31	12.22	SlimPulse	0
87	7095.00	28.74	351.52	32.00	7080.52	65.51	65.45	-4.57	65.61	356.01	9.62	SlimPulse	0
88	7126.00	31.77	351.80	31.00	7107.29	81.00	80.90	-6.83	81.19	355.17	9.79	SlimPulse	0
89	7160.00	35.51	351.92	34.00	7135.60	99.68	99.55	-9.50	100	354.55	11.02	SlimPulse	0
90	7189.00	38.70	351.99	29.00	7158.72	117.03	116.87	-11.95	117.48	354.16	11.00	SlimPulse	0
91	7220.00	41.72	350.71	31.00	7182.39	136.86	136.65	-14.96	137.47	353.75	10.08	SlimPulse	0
92	7315.00	50.85	353.87	95.00	7247.98	204.96	204.62	-24.02	206.03	353.30	9.91	SlimPulse	0
93	7409.00	59.14	0.24	94.00	7301.89	281.78	281.40	-27.75	282.76	354.37	10.42	SlimPulse	0

94	7503.00	68.14	4.92	94.00	7343.60	365.73	365.41	-23.83	366.19	356.27	10.56	SlimPulse	0
95	7597.00	78.11	6.79	94.00	7370.85	454.94	454.78	-14.63	455.01	358.16	10.77	SlimPulse	0
96	7692.00	87.21	5.93	95.00	7382.98	548.32	548.32	-4.20	548.34	359.56	9.62	SlimPulse	0
97	7786.00	88.93	0.70	94.00	7386.14	641.98	642.07	1.22	642.07	0.11	5.86	SlimPulse	0
98	7881.00	89.21	358.15	95.00	7387.68	736.96	737.05	0.27	737.05	0.02	2.70	SlimPulse	0
99	7975.00	89.62	356.96	94.00	7388.64	830.92	830.96	-3.74	830.96	359.74	1.33	SlimPulse	0
100	8069.00	89.38	356.05	94.00	7389.46	924.82	924.78	-9.47	924.83	359.41	1.00	SlimPulse	0
101	8163.00	89.17	356.14	94.00	7390.64	1018.67	1018.55	-15.87	1018.67	359.11	0.24	SlimPulse	0
102	8257.00	89.45	358.68	94.00	7391.77	1112.62	1112.44	-20.12	1112.62	358.96	2.72	SlimPulse	0
103	8352.00	90.28	359.52	95.00	7392.00	1207.61	1207.43	-21.61	1207.62	358.97	1.24	SlimPulse	0
104	8446.00	90.17	358.42	94.00	7391.63	1301.61	1301.41	-23.30	1301.62	358.97	1.17	SlimPulse	0
105	8540.00	89.66	0.85	94.00	7391.77	1395.60	1395.40	-23.90	1395.6	359.02	2.64	SlimPulse	0
106	8635.00	88.76	358.32	95.00	7393.08	1490.38	1490.38	-24.59	1490.58	359.05	2.83	SlimPulse	0
107	8729.00	87.73	358.90	94.00	7395.96	1584.53	1584.31	-26.87	1584.53	359.03	1.26	SlimPulse	0
108	8823.00	87.76	357.29	94.00	7399.66	1678.44	1678.18	-30.00	1678.45	358.98	1.71	SlimPulse	0
109	8918.00	86.94	359.37	95.00	7404.06	1773.32	1773.03	-32.76	1773.33	358.94	2.36	SlimPulse	0
110	9013.00	88.73	359.05	95.00	7407.65	1868.25	1867.95	-34.07	1868.26	358.96	1.92	SlimPulse	0
111	9108.00	89.59	0.73	95.00	7409.05	1963.23	1962.93	-34.25	1963.23	359.00	1.99	SlimPulse	0
112	9203.00	89.79	359.47	95.00	7409.56	2058.21	2057.93	-34.08	2058.21	359.05	1.35	SlimPulse	0
113	9297.00	90.17	358.40	94.00	7409.59	2152.21	2151.91	-35.83	2152.21	359.05	1.20	SlimPulse	0
114	9392.00	89.34	2.66	95.00	7410.16	2247.16	2246.88	-34.94	2247.16	359.11	4.61	SlimPulse	0
115	9486.00	90.93	358.24	94.00	7410.10	2341.10	2340.85	-34.20	2341.1	359.16	5.07	SlimPulse	0
116	9581.00	88.76	0.08	95.00	7410.36	2436.09	2435.83	-35.59	2436.09	359.16	2.99	SlimPulse	0
117	9674.00	89.93	1.35	93.00	7411.42	2529.05	2528.82	-34.42	2529.05	359.22	1.85	SlimPulse	0
118	9769.00	89.97	359.97	95.00	7411.50	2624.03	2623.81	-34.16	2624.03	359.25	2.51	SlimPulse	0
119	9863.00	90.65	2.64	94.00	7411.00	2717.97	2717.78	-32.85	2717.98	359.31	3.98	SlimPulse	0
120	9958.00	90.86	0.79	95.00	7409.74	2812.86	2812.73	-30.00	2812.89	359.39	1.96	SlimPulse	0
121	10053.00	89.31	359.45	95.00	7409.60	2907.84	2907.72	-29.81	2907.87	359.41	2.16	SlimPulse	0
122	10148.00	90.38	357.89	95.00	7409.86	3002.84	3002.69	-32.02	3002.86	359.39	1.99	SlimPulse	0
123	10242.00	89.69	358.18	94.00	7409.80	3096.82	3096.64	-35.24	3096.84	359.35	0.80	SlimPulse	0
124	10337.00	90.28	358.81	95.00	7409.83	3191.81	3191.60	-37.73	3191.83	359.32	0.90	SlimPulse	0
125	10432.00	90.41	356.44	95.00	7409.26	3286.77	3286.51	-41.67	3286.78	359.27	2.50	SlimPulse	0
126	10526.00	89.52	359.04	94.00	7409.31	3380.73	3380.43	-45.37	3380.73	359.23	2.93	SlimPulse	0
127	10620.00	90.34	355.93	94.00	7409.43	3474.68	3474.33	-49.49	3474.68	359.18	3.42	SlimPulse	0
128	10715.00	88.80	0.77	95.00	7410.14	3569.64	3569.25	-52.22	3569.64	359.16	5.34	SlimPulse	0
129	10809.00	90.41	359.18	94.00	7410.79	3663.62	3663.25	-52.27	3663.62	359.18	2.41	SlimPulse	0
130	10904.00	89.35	0.85	95.00	7410.99	3758.60	3758.24	-52.17	3758.6	359.20	2.18	SlimPulse	0
131	10999.00	90.45	358.62	95.00	7411.16	3853.59	3853.23	-52.53	3853.59	359.22	2.71	SlimPulse	0
132	11093.00	88.59	1.70	94.00	7411.95	3947.55	3947.21	-52.27	3947.56	359.24	3.82	SlimPulse	0
133	11188.00	91.20	359.12	95.00	7412.12	4042.51	4042.19	-51.60	4042.52	359.27	3.86	SlimPulse	0
134	11282.00	88.35	0.63	94.00	7412.49	4136.49	4136.18	-51.80	4136.5	359.28	3.44	SlimPulse	0
135	11377.00	89.90	0.28	95.00	7413.94	4231.45	4231.16	-51.05	4231.47	359.31	1.67	SlimPulse	0
136	11472.00	88.63	1.40	95.00	7415.17	4326.40	4326.14	-49.65	4326.43	359.34	1.79	SlimPulse	0
137	11566.00	91.07	359.49	94.00	7415.42	4420.37	4420.13	-48.92	4420.4	359.37	3.30	SlimPulse	0
138	11661.00	89.38	358.20	95.00	7415.05	4515.36	4515.10	-50.83	4515.39	359.35	2.23	SlimPulse	0
139	11731.00	87.63	359.10	70.00	7416.88	4585.33	4585.05	-52.48	4585.36	359.34	2.82	SlimPulse	0
140	11776.00	87.63	359.10	45.00	7418.74	4630.29	4630.01	-53.18	4630.32	359.34	0.01	Proj to Bit	7