

Results of Directional Survey

30-025-35012

ARCH PETROLEUM INC
E C HILL A # 7
TEAGUE;SIMPSON

	MD	N/S	E/W
	9100	-40.04	67.81
TOP PERFS	9154	-41.17	67.87
BOT PERFS	9174	-40.46	67.83
	9200	-42.14	67.93

NEXT TO LAST	9300	-43.04	66.56
LAST READING	9357	-43.68	65.01
TD	9357	-43.68	65.01

Surface Location	540	FS	1850	FE
Projected BHL	496	FS	1915	FE
Location of				
Top Perfs	499	FS	1918	FE
Bottom Perfs	500	FS	1918	FE

SUMMARY of Subsurface Locations

Surface Location	O-27-23S-37E	540	FS	1850	FE
Top Perfs	O-27-23S-37E	499	FS	1918	FE
Bottom Perfs	O-27-23S-37E	500	FS	1918	FE
Projected TD	O-27-23S-37E	496	FS	1915	FE

Perforations are within the required stand-off for a 40 acre proration unit comprising unit letters O

A Gyrodata Directional Survey

for
Arch Petroleum Inc
~~PRODUCERS~~
Well: E.C. HILL NO. 7# 4-1/2" DRILLPIPE
Unit 8 22-23s -37e
Location: TMBR/SHARP #14, LEA COUNTY, NEW MEXICO

30-025- 35012
SWR: 540/s + 1850/E
BHL: 496/s + 1915/E

Job Number: MD0101GMW104

Run Date: 1/8/01

Surveyor: John Zugg Ruben Clemence

Calculation Method: MINIMUM CURVATURE

Survey Latitude: 32.266700 deg. N

Azimuth Correction:

Gyro: Bearings are Relative to True North

Vertical Section Calculated from Well Head Location

Closure Calculated from Well Head Location

Horizontal Coordinates Calculated from Well Head Location

A Gyrodata Directional Survey

POGO PRODUCERS

Well: E.C. HILL NO. 7A, 4-1/2" DRILLPIPE

Location: TMBR/SHARP #14, LEA COUNTY, NEW MEXICO

Job Number: MD0101GMW104

MEASURED DEPTH feet	I N C L deg.	A Z I M U T H deg.	B O R E H O L E B E A R I N G deg. min.	D O G L E G S E V E R I T Y deg./ 100 ft.	V E R T I C A L D E P T H feet	C L O S U R E D I S T. A Z I M U T H feet deg.	H O R I Z O N T A L C O O R D I N A T E S feet
0.0	0.00	0.00	N 0 0 E	0.00	0.0	0.0 0.0	0.00 N 0.00 E
0 - 9357 FT. RATE GYROSCOPIC MULTISHOT SURVEY RUN INSIDE 4-1/2" DRILLPIPE ALL MEASURED DEPTHS AND COORDINATES REFERENCED TO TMBR/SHARP #14 R.K.B.							
100.0	0.46	283.30	N 76 42 W	0.46	100.0	0.4 283.3	0.09 N 0.39 W
200.0	0.64	268.69	S 88 41 W	0.22	200.0	1.4 277.3	0.17 N 1.35 W
300.0	0.82	266.81	S 86 49 W	0.18	300.0	2.6 272.7	0.12 N 2.61 W
400.0	0.99	264.93	S 84 56 W	0.18	400.0	4.2 270.1	0.01 N 4.18 W
500.0	0.98	253.77	S 73 46 W	0.19	500.0	5.9 267.0	0.31 S 5.87 W
600.0	0.98	242.61	S 62 36 W	0.19	599.9	7.5 262.8	0.94 S 7.45 W
700.0	1.08	240.76	S 60 46 W	0.11	699.9	9.2 258.8	1.79 S 9.02 W
800.0	1.17	238.92	S 58 55 W	0.11	799.9	11.1 255.5	2.78 S 10.72 W
900.0	1.14	239.76	S 59 45 W	0.04	899.9	13.0 253.0	3.81 S 12.45 W
1000.0	1.10	240.59	S 60 36 W	0.04	999.9	14.9 251.3	4.78 S 14.14 W
1100.0	0.97	243.20	S 63 12 W	0.13	1099.9	16.7 250.3	5.63 S 15.73 W
1200.0	0.85	245.81	S 65 49 W	0.13	1199.8	18.3 249.8	6.32 S 17.17 W
1300.0	0.84	248.21	S 68 13 W	0.04	1299.8	19.8 249.6	6.90 S 18.54 W
1400.0	0.84	250.60	S 70 36 W	0.04	1399.8	21.2 249.6	7.41 S 19.91 W
1500.0	0.61	252.74	S 72 44 W	0.22	1499.8	22.5 249.7	7.81 S 21.11 W
1600.0	0.39	254.88	S 74 53 W	0.22	1599.8	23.4 249.8	8.06 S 21.95 W
1700.0	0.35	150.04	S 29 58 E	0.59	1699.8	23.7 249.2	8.42 S 22.12 W
1800.0	0.31	45.19	N 45 12 E	0.52	1799.8	23.4 248.7	8.49 S 21.78 W
1900.0	0.47	49.57	N 49 34 E	0.17	1899.8	22.7 249.3	8.03 S 21.27 W
2000.0	0.64	53.94	N 53 57 E	0.17	1999.8	21.8 250.1	7.44 S 20.51 W

A Gyrodata Directional Survey

POGO PRODUCERS

Well: E.C. HILL NO. 7A, 4-1/2" DRILLPIPE

Location: TMBR/SHARP #14, LEA COUNTY, NEW MEXICO

Job Number: MD0101GMW104

MEASURED DEPTH feet	I N C L deg.	A Z I M U T H deg.	B O R E H O L E B E A R I N G deg. min.	D O G L E G S E V E R I T Y deg./ 100 ft.	V E R T I C A L D E P T H feet	C L O S U R E D I S T. A Z I M U T H feet deg.	H O R I Z O N T A L C O O R D I N A T E S feet
2100.0	0.77	52.25	N 52 15 E	0.14	2099.8	20.6 251.1	6.70 S 19.53 W
2200.0	0.91	50.56	N 50 34 E	0.14	2199.8	19.3 252.5	5.78 S 18.39 W
2300.0	0.98	52.60	N 52 36 E	0.08	2299.8	17.7 254.4	4.76 S 17.10 W
2400.0	1.05	54.65	N 54 39 E	0.08	2399.8	16.1 256.7	3.71 S 15.67 W
2500.0	0.84	64.62	N 64 37 E	0.27	2499.7	14.5 258.6	2.87 S 14.26 W
2600.0	0.63	74.59	N 74 36 E	0.24	2599.7	13.3 259.6	2.40 S 13.06 W
2700.0	0.44	85.81	N 85 48 E	0.21	2699.7	12.3 259.6	2.23 S 12.14 W
2800.0	0.26	97.02	S 82 59 E	0.20	2799.7	11.7 259.1	2.23 S 11.53 W
2900.0	0.29	81.97	N 81 58 E	0.08	2899.7	11.3 258.6	2.22 S 11.06 W
3000.0	0.33	66.92	N 66 55 E	0.09	2999.7	10.7 258.9	2.07 S 10.54 W
3100.0	0.30	54.78	N 54 47 E	0.07	3099.7	10.2 259.8	1.81 S 10.06 W
3200.0	0.28	42.64	N 42 39 E	0.07	3199.7	9.8 261.3	1.48 S 9.68 W
3300.0	0.28	29.05	N 29 3 E	0.07	3299.7	9.5 263.4	1.08 S 9.40 W
3400.0	0.27	15.46	N 15 28 E	0.06	3399.7	9.2 266.0	0.65 S 9.22 W
3500.0	0.30	3.51	N 3 31 E	0.07	3499.7	9.1 269.0	0.15 S 9.14 W
3600.0	0.33	351.57	N 8 26 W	0.07	3599.7	9.2 272.5	0.40 N 9.16 W
3700.0	0.42	347.07	N 12 56 W	0.09	3699.7	9.3 276.4	1.04 N 9.29 W
3800.0	0.50	342.57	N 17 26 W	0.09	3799.7	9.7 280.8	1.81 N 9.50 W
3900.0	0.60	333.23	N 26 46 W	0.14	3899.7	10.2 285.3	2.70 N 9.87 W
4000.0	0.70	323.90	N 36 6 W	0.15	3999.7	11.1 289.3	3.67 N 10.47 W
4100.0	0.73	318.39	N 41 37 W	0.07	4099.7	12.2 292.4	4.64 N 11.26 W
4200.0	0.76	312.88	N 47 7 W	0.08	4199.7	13.4 294.6	5.57 N 12.17 W
4300.0	0.86	302.40	N 57 36 W	0.18	4299.7	14.8 295.8	6.42 N 13.28 W
4400.0	0.95	291.91	N 68 5 W	0.19	4399.7	16.3 295.9	7.13 N 14.69 W

A Gyrodata Directional Survey

POGO PRODUCERS

Well: E.C. HILL NO. 7A, 4-1/2" DRILLPIPE

Location: TMBR/SHARP #14, LEA COUNTY, NEW MEXICO

Job Number: MD0101GMW104

MEASURED DEPTH feet	I N C L deg.	AZIMUTH deg.	BORE HOLE BEARING deg. min.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. AZIMUTH feet deg.	HORIZONTAL COORDINATES feet
4500.0	0.91	286.53	N 73 28 W	0.10	4499.6	17.9 295.3	7.67 N 16.22 W
4600.0	0.88	281.14	N 78 51 W	0.09	4599.6	19.5 294.4	8.05 N 17.74 W
4700.0	0.82	274.87	N 85 8 W	0.11	4699.6	20.9 293.3	8.25 N 19.20 W
4800.0	0.76	268.61	S 88 36 W	0.10	4799.6	22.2 292.0	8.30 N 20.58 W
4900.0	0.73	274.40	N 85 36 W	0.08	4899.6	23.4 290.8	8.33 N 21.89 W
5000.0	0.70	280.20	N 79 48 W	0.08	4999.6	24.6 290.2	8.49 N 23.13 W
5100.0	0.57	273.91	N 86 6 W	0.15	5099.6	25.7 289.6	8.63 N 24.23 W
5200.0	0.44	267.61	S 87 37 W	0.14	5199.6	26.6 289.0	8.65 N 25.11 W
5300.0	0.39	265.04	S 85 2 W	0.05	5299.6	27.2 288.4	8.60 N 25.84 W
5400.0	0.35	262.46	S 82 28 W	0.05	5399.6	27.8 287.9	8.54 N 26.48 W
5500.0	0.32	287.26	N 72 45 W	0.15	5499.6	28.4 287.6	8.58 N 27.05 W
5600.0	0.30	312.05	N 47 57 W	0.14	5599.6	28.9 287.8	8.84 N 27.52 W
5700.0	0.28	340.22	N 19 47 W	0.14	5699.6	29.3 288.4	9.24 N 27.79 W
5800.0	0.27	8.38	N 8 23 E	0.13	5799.6	29.5 289.2	9.71 N 27.84 W
5900.0	0.23	20.79	N 20 47 E	0.07	5899.6	29.5 290.0	10.12 N 27.74 W
6000.0	0.19	33.20	N 33 12 E	0.06	5999.6	29.5 290.7	10.44 N 27.58 W
6100.0	0.26	77.78	N 77 47 E	0.18	6099.6	29.3 291.3	10.63 N 27.27 W
6200.0	0.34	122.35	S 57 39 E	0.24	6199.6	28.8 291.4	10.52 N 26.79 W
6300.0	0.33	126.14	S 53 52 E	0.02	6299.6	28.2 291.2	10.19 N 26.31 W
6400.0	0.33	129.93	S 50 4 E	0.02	6399.6	27.7 290.8	9.84 N 25.86 W
6500.0	0.50	147.18	S 32 49 E	0.21	6499.6	27.1 290.1	9.29 N 25.41 W
6600.0	0.68	164.42	S 15 35 E	0.25	6599.6	26.4 288.5	8.35 N 25.01 W
6700.0	0.76	168.61	S 11 23 E	0.10	6699.6	25.7 286.1	7.13 N 24.72 W
6800.0	0.85	172.80	S 7 12 E	0.10	6799.5	25.2 283.2	5.75 N 24.50 W

A Gyrodata Directional Survey

POGO PRODUCERS

Well: E.C. HILL NO. 7A, 4-1/2" DRILLPIPE

Location: TMBR/SHARP #14, LEA COUNTY, NEW MEXICO

Job Number: MD0101GMW104

MEASURED DEPTH feet	I N C L deg.	AZIMUTH deg.	BORE HOLE BEARING deg. min.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. AZIMUTH feet deg.	HORIZONTAL COORDINATES feet
6900.0	0.97	182.68	S 2 41 W	0.20	6899.5	24.8 279.7	4.17 N
7000.0	1.09	192.57	S 12 34 W	0.22	6999.5	24.8 275.5	2.39 N
7100.0	1.08	227.38	S 47 23 W	0.65	7099.5	25.6 271.8	0.82 N
7200.0	1.08	262.20	S 82 12 W	0.65	7199.5	27.2 270.1	0.06 N
7300.0	1.36	199.34	S 19 20 W	1.29	7299.5	28.6 267.6	1.19 S
7400.0	1.63	136.47	S 43 32 E	1.58	7399.4	28.2 263.2	3.34 S
7500.0	2.43	124.00	S 56 0 E	0.90	7499.4	25.8 257.6	5.56 S
7600.0	3.22	111.52	S 68 29 E	1.00	7599.2	22.2 249.6	7.77 S
7700.0	3.37	112.80	S 67 12 E	0.17	7699.1	18.4 237.4	9.94 S
7800.0	3.52	114.08	S 65 55 E	0.17	7798.9	15.9 219.1	12.33 S
7900.0	3.57	112.85	S 67 9 E	0.09	7898.7	15.4 196.3	14.80 S
8000.0	3.62	111.61	S 68 23 E	0.09	7998.5	17.2 175.1	17.17 S
8100.0	3.61	111.02	S 68 59 E	0.04	8098.3	20.8 159.4	19.46 S
8200.0	3.61	110.42	S 69 35 E	0.04	8198.1	25.4 148.6	21.69 S
8300.0	3.68	109.20	S 70 48 E	0.10	8297.9	30.6 141.2	23.84 S
8400.0	3.74	107.99	S 72 1 E	0.10	8397.7	36.2 135.6	25.90 S
8500.0	3.86	104.96	S 75 2 E	0.23	8497.5	42.1 131.2	27.78 S
8600.0	3.97	101.94	S 78 4 E	0.24	8597.3	48.3 127.5	29.36 S
8700.0	3.96	104.41	S 75 36 E	0.17	8697.0	54.6 124.5	30.93 S
8800.0	3.95	106.88	S 73 7 E	0.17	8796.8	61.2 122.4	32.79 S
8900.0	3.84	108.82	S 71 11 E	0.17	8896.5	67.8 121.0	34.87 S
9000.0	3.73	110.75	S 69 15 E	0.17	8996.3	74.3 120.0	37.10 S
9100.0	2.11	166.89	S 13 7 E	3.10	9096.2	78.7 120.6	40.04 S
9200.0	0.48	223.02	S 43 1 W	1.88	9196.2	79.9 121.8	42.14 S

A Gyrodata Directional Survey

POGO PRODUCERS

Well: E.C. HILL NO. 7A, 4-1/2" DRILLPIPE

Location: TMBR/SHARP #14, LEA COUNTY, NEW MEXICO

Job Number: MD0101GMW104

MEASURED DEPTH feet	I N C L deg.	A Z I M U T H deg.	B O R E H O L E B E A R I N G deg. min.	D O G L E G S E V E R I T Y deg./ 100 ft.	V E R T I C A L D E P T H feet	C L O S U R E D I S T. A Z I M U T H feet deg.	H O R I Z O N T A L C O O R D I N A T E S feet
9300.0	1.42	241.53	S 61 32 W	0.97	9296.2	79.3 122.9	43.04 S 66.56 E
9357.0	1.95	252.08	S 72 5 W	1.08	9353.1	78.3 123.9	43.68 S 65.01 E

Final Station Closure: Distance: 78.32 ft Az: 123.90 deg.

