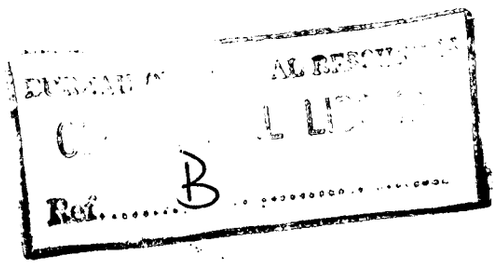
COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS



RECORD No. 1962/52

PICKANJINNIE No. 1 BORE SEISMIC VELOCITY SURVEY, QUEENSLAND 1960

by

K.B. Lodwick and E.R. Smith

RECORD No. 1962/52

PICKANJINNIE No. 1 BORE SEISMIC VELOCITY SURVEY, QUEENSLAND 1960

by

K.B. Lodwick and E.R. Smith

CONTENTS

ILLUSTRATIONS

SUMMARY

On 12th July 1960, a velocity survey of the A.A.O. Pickanjinnie No. 1 bore was made by the Bureau of Mineral Resources. The bore had been drilled to a depth of 5218 ft and was surveyed to the bottom.

Average velocities measured in the bore were:

Mesozoic	10,050 ft/sec
Permian	13,800 "
Timbury Hills Formation	17,400 "

The average velocities for the Mesozoic rocks and the Timbury Hills Formation are similar to those measured in the Timbury Hill No. 2 bore. However, it seems impossible to correlate individual units within the Mesozoic sequence according to their velocity.

1. INTRODUCTION

On 12th July 1960, a velocity survey of the Associated Australian Oilfields Pickanjinnie No. 1 bore was made by a Bureau of Mineral Resources seismic party. The bore is about 1 mile south of Pickanjinnie railway station (Plate 1) 20 miles east of Roma; it had been drilled to a depth of 5218 ft and was surveyed to the bottom. The formations drilled were Mesozoic to a depth of 4180 ft, Permian to 4835 ft, and the equivalent of the Timbury Hills Formation of unknown age to the bottom of the bore, the depths being measured from the rotary table. Associated Australian Oilfields N.L. (A.A.O.) provided the information on the stratigraphic boundaries, which are shown on Plate 3. The bore produced petroliferous gas at a rate of over 5 million cubic feet per day from three horizons near the base of the Mesozoic and within the Permian strata.

2. FIELD WORK

The Bureau provided the seismic equipment, including the well geophone, for the velocity survey and Schlumberger (contractor to A.A.O.) provided the cable truck and winch and the personnel for operating it. Mr S.S. Derrington (A.A.O. well geologist) was present during the survey and advised Bureau personnel of the nature of the strata of the bore and presented his interpretation of the stratigraphy. Necessary surveying was done by Mr W.L. Richards of the Department of the Interior.

Three shot-points were used during the survey; Shot-points 1 and 2, 600 and 1000 ft respectively north of the bore, and Shot-point 3, 600 ft south of the bore. The layout of the shot-points and the positions of geophones used for recording reflections are shown on Plate 2.

Six conductors were available in the Schlumberger cable. The function of each trace on the records presented in this report (Plates 5 to 12) is as follows:

Trace	Function	
1	Vertical component	high gain
2	" "	medium gain
3	" "	low gain
4	First horizontal component	high gain
5	" " "	medium gain
6	" " "	low gain
7	Second horizontal component	high gain
8	" " "	medium gain
9	" " "	low gain
10 to 21	Reflection geophones	
22	Time-break and 100-c/s bleeper	

The depths of the well geophone for which records were taken were chosen at stratigraphic boundaries (Plate 3) and so that the depth interval between measurements in the bore was not more than 300 ft.

3. RESULTS

Good-quality first breaks on the well geophone were recorded using charges of from 10 to 25 lb at shot depths between 60 and 86 ft (Plates 5 to 12).

The well-geophone times recorded, from Shot-point 1 only, were used for the computation of velocities; the data recorded from Shot-points 2 and 3 were used for confirmation of the results from Shot-point 1 and to aid the recognition of cable breaks.

The time of a reflection recorded from the first shot in a hole is used as a reference time, and well-geophone times for subsequent shots in this hole are corrected to this reference by the variations in the reflection time. This correction accounts for hole fatigue and variations in the depth of shot. The elevation correction is then constant for all shots from this hole, and is equal to the correction for the first hole.

The computation of velocities is presented in tabular form on Plates 2A and 2B. The corrected slant times and the vertical times are plotted against depth of the well geophone on Plate 3.

The velocities of the Mesozoic sediments of the Roma area are such that the time difference between cable break and true break is small, and it is sometimes hard to decide whether the true time has been picked on the record (Smith and Lodwick, 1962). Using a three-component well geophone it might be expected that energy travelling obliquely from the shot to the well geophone (producing a true break) would disturb either one or both horizontal components simultaneously with the vertical component; energy travelling vertically down the cable (producing a cable break) might disturb only the vertical component. This criterion has been used in recognizing cable breaks and also in comparing the times of arrival of energy from shot holes at different distances from the bore. Cable breaks have been plotted on the time-depth curve (Plate 3) and it has been possible to estimate a cable velocity from them (11,325 ft/sec).

The corrected slant time-depth curves are shown for the two different distances of shot holes from the bore on Plate 3. The vertical time-depth curve, using the results of Shot-point 1 only, is also shown. Interval and average velocities have been calculated from these vertical times and are also shown on Plate 3.

4. DISCUSSION

The average velocity of the Mesozoic rocks is 10,050 ft/sec. This compares closely with the value of 9800 ft/sec measured in the Timbury Hills No. 2 bore (Smith and Lodwick, 1962). However, there appears to be little correlation between the individual interval velocities measured in the two bores throughout the Mesozoic sequence, and the respective stratigraphic units. There is some similarity in the two interval velocity curves in the basal 1500 ft on the Mesozoic sequence, but to correlate this section of each bore requires that the boundaries of the Walloon Coal Measures, Bundamba Group, and Moolayember Shale be changed relatively by about 700 ft from those supplied.

No Permian sediments were encountered above the Timbury Hills Formation in the Timbury Hills No. 2 bore (Smith and Lodwick, op. cit.), but about 250 ft of them is thought to be present at Pickanjinnie (Plate 3). The interval velocities measured in the formations below the base of the Mesozoic may be erroneous because the short depth intervals at which shots were taken, combined with a high velocity, make the time differences too small for accurate velocity calculation. If the velocities are calculated over the full intervals of Permian strata and Timbury Hills Formation, then the interval velocities are 13,800 ft/sec for the Permian sequence and 17,400 ft/sec for the Timbury Hills Formation. These are more reasonable values; in particular, this value for the Timbury Hills Formation compares closely with that obtained in the Timbury Hills No. 2 bore, namely 17,980 ft/sec.

The reflection time to the top of each stratigraphic division has been calculated from the formula: reflection time to trace 10 (from Shot-point 1) = 2 x corrected slant time + elevation and weathering correction. Each of these reflection times is shown with its appropriate stratigraphic division on Plate 12, so that the positions of the reflections recorded may be ascertained.

5. CONCLUSIONS

The following conclusions may be drawn from the survey:

(a) It has been possible to distinguish cable breaks from true breaks, and the velocities calculated are considered reliable. There may, however, be some inaccuracy in the interval velocities of the rocks below the Mesozoic sequence, owing to the smallness of the time intervals measured.

(b) The average velocities of each of the main stratigraphic divisions are:

Mesozoic	10,050 ft/sec
Permian	13,800 "
Timbury Hills Formation	17,400 "

The values for the Mesozoic sequence and the Timbury Hills Formation are similar to those measured in the Timbury Hills No. 2 bore.

6. REFERENCES

SMITH, E.R. and LODWICK, K.B., 1962 — Timbury Hills No. 2 bore seismic velocity survey, Queensland 1960. Bur. Min. Resour. Aust. Rec. 1962/51.

PLATE 1

Oogarra
Noreeten
Mt Beagle
Kingull
Yingerbay
Nullawurt
Euthulla
Minka
Tineen
Ona Ona
Hodgson
Bungeworgorai
Roma
A.A.O
TIMBURY HILLS
No.2 BORE
Warooby
Blythdale
Pickanjinnie
Wallumbilla
A.A.O.
PICKANJINNIE
No.1 BORE
Armoo
Yuleba
Bendemere
Mt Combabula
"Wattle Park"
"Muggleton"
"Miawood"
Mt Bassett
"Roma Downs"
"Richmond Downs"
"Beaconsfield"
"Maffra"
"Yalebone"
"Wallabella"
1935
1946
1950
1954
1967
TRAVERSE N (REFRACTION)
RANGE
GRAFTON
Bungil Creek
Bungeworgorai Creek
Dargal Creek
Roma Creek
Blyth Creek
Wallumbilla Creek
Kangaroo Creek
Yuleba Creek
Armoo Creek
Pickanjinnie Creek
26°30'
149°00
149°25'

QUEENSLAND
Roma

LOCATION
Reference to Australian 4-Mile Military Map Series

LEGEND

- Bore
- Railway and Railway Station
- Metal or Gravel Road
- Track
- House

A.A.O PICKANJINNIE No.1 BORE VELOCITY SURVEY, QUEENSLAND, 1960

LOCALITY MAP

MILES
4 0 4 8 12

Geophysical Branch, Bureau of Mineral Resources, Geology and Geophysics G 38-83-1

To Accompany Record No. 1962/52

WELL VELOCITY SURVEY DATA SHEET (SHEET 1).

WELL NAME *PICKANJINNIE No.1.* OWNER *ASSOCIATED AUSTRALIAN OILFIELDS N.L.* WELL LOGGING CONTRACTOR *SCHLUMBERGER (AUST.) LTD*

LOCALITY *ROMA AREA, QLD* ADDRESS ADDRESS

COORDINATES *26°35'42"S., 149°07'18"E* DRILLING CONTRACTOR *MINES ADMINISTRATION PTY LTD* TYPE AND NUMBER OF LOGGING UNIT

DATE OF SURVEY *12TH JULY 1960.* ADDRESS LOGGING UNIT OPERATOR

ORGANIZATION SUPERVISING VELOCITY SURVEY — SEISMIC INSTRUMENTS — WELL GEOPHONE

B.M.R. G+G. MAKE *T.I.C.* MAKE *T.I.C.* B.M.R. REPRESENTATIVE

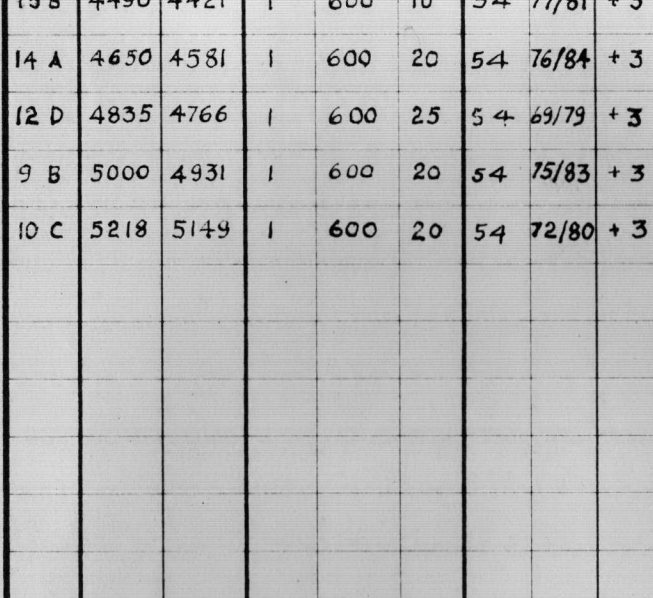
ADDRESS TYPE *MODEL 621* TYPE *3 COMPONENT* DATA CALCULATION *K.B. LODWICK.*

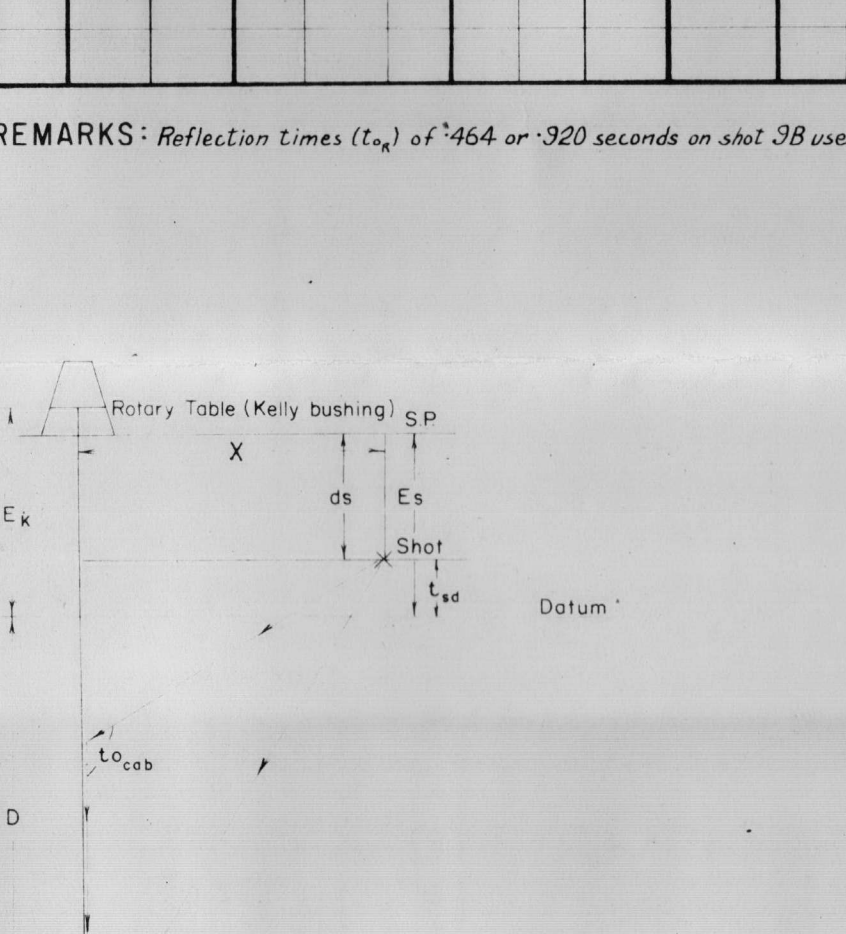
SURVEY SUPERVISOR *E.R. SMITH.* No

E_K = *69 ft* Vo = Ve = *8500 ft/sec* Do = *1000 ft.* ρm = B.H.T. or Tm = Vcab (Manufacturer) = (Test) = Cable Depth Accuracy = ±1ft

Shot No	E_K+D	D	S.P.	X	chge	Es	ds	t_{sd}	∝	tv_1. Gr.	tv_2. Gr.	tha_1. Gr.	tha_2. Gr	thb_1. Gr.	thb_2. Gr.	t_{RG} or to_R Gr.	Δt_{RG} or Δto_R	t_{cab}	to_{cab} Gr.	t_o or $t_o - \frac{t_{sd}}{\cos\alpha}$	Cos.∝	tc	Va	ΔD	Δtc	Vi
34Q	800	731	1	600	11	54	60/64	+3	39°23'	112 G						471 F	-7	107		108	.773	83.5	8750	350	40.5	8650
33P	1150	1081	1	600	11	54	64/68	+3	29°04'	143 G						468 F	-4	146		142	.874	124	8730	278	29	9590
31N	1428	1359	1	600	11	54	65/69	+3	23°56'	168 F						468 F	-4	172		167	.914	153	8890	272	29	9390
30M	1700	1631	1	600	11	54	65/69	+3	20°17'	194 G						467 F	-3	185		194	.938	182	8980	300	29	10340
29L	2000	1931	1	600	11	54	68/72	+3	17°15'	221 G						467 F	-3	211	213	221	.955	211	9160	300	29	10340
28K	2300	2231	1	600	11	54	68/72	+3	15°12'	250 F						468 F	-4	237		249	.965	240	9300	300	28.5	10510
26J	2600	2531	1	600	11	54	71/75	+3	13°20'	274 F						465 F	-1	262		276	.973	268.5	9420	298	30.5	9770
25I	2898	2829	1	600	11	54	74/78	+3	12°03'	304 G						921 F	-1	288	299	306	.978	299	9470	302	30	10100
24H	3200	3131	1	600	7½	54	78/81	+3	11°11'	332 F						464 F	0	314		335	.981	329	9520	250	19	13140
23G	3450	3381	1	600	10	54	78/82	+3	9°56'	351 F						465 F	-1	336		353	.985	348	9740	300	25	12000
21F	3750	3681	1	600	10	54	78/82	+3	9°15'	375 G						464 F	0	362		378	.987	373	9880	257	21.5	11950
19E	4007	3938	1	600	10	54	80/84	+3	8°53'	396 F						464 F	0	384	406	399	.988	394.5	9880	173	14.0	12340
16C	4180	4111	1	600	15	54	80/86	+3	8°30'		417 P					921 F	-1	400		413	.989	408.5	10050	310	31.5	9850
15B	4490	4421	1	600	10	54	77/81	+3	7°41'	442 F						465 F	-1	426		444	.991	440	10030	160	9	17780
14A	4650	4581	1	600	20	54	76/84	+3	7°15'		460 P					468 F	-4	440		453	.992	449	10210	185	16	11560
12D	4835	4766	1	600	25	54	69/79	+3	7°01'	469 G						923 F	-3	456		469	992	465	10240	165	12	13750
9B	5000	4931	1	600	20	54	75/83	+3	6°47'	477 F						920 464 F	0	471		480	.993	477	10330	218	10	21800
10C	5218	5149	1	600	20	54	72/80	+3	6°35'	490 G						467 F	-3	490		490	.993	487.	10570			

REMARKS: *Reflection times (to_R) of ·464 or ·920 seconds on shot 9B used as reference for all other shots fired in shot-hole 1.*





LAYOUT OF WELL SHOT-POINTS AND GEOPHONE SPREAD

SCALE IN FEET

600 0 600 1200 1800

DEFINITIONS OF SYMBOLS AND COLUMN HEADINGS:

- E_K+D — Depth of well geophone below rotary table Kelly bushing
- Do — Elevation of Datum above sea level
- E_K — Elevation of rotary table Kelly bushing referred to datum plane
- D — Depth of well geophone below datum plane
- Δ D — Difference between depths of well geophone for two shots
- S.P. — Shot-point
- X — Distance of shot-point from centre of well
- chge — Pounds weight of explosive fired
- Es — Elevation of shot-point referred to datum plane
- ds — Depth of shot below surface
- Vo — Weathering velocity
- Ve — Subweathering velocity
- t_{sd} — Vertical time from shot to datum plane. Normally = $\frac{Es-ds}{Ve}$
- ∝ — Vertical angle subtended by straight line from shot to well geophone = $\tan^{-1}\frac{X}{D+Es-ds}$
- tv_1 — Vertical component first break time for well geophone
- tv_2 — Vertical component first trough time for well geophone
- tha_1 — Horizontal component A first break time for well geophone
- tha_2 — Horizontal component A first trough time for well geophone
- thb_1 — Horizontal component B first break time for well geophone
- thb_2 — Horizontal component B first trough time for well geophone
- RG — Reference geophone
- t_{RG} — Reference geophone time
- Δt_{RG} — Reference geophone correction time. In general practice $tv_1 - \Delta t_{RG}$ is best estimate of t_o
- to_R — Reference reflection time
- Δto_R — Reference reflection correction time. In general practice $tv_1 - \Delta to_R$ is best estimate of $t_o - \frac{t_{sd}}{\cos\alpha}$
- t_{cab} — Calculated cable break time
- to_{cab} — Observed vertical component cable break time
- Δto_{cab} — Difference between to_{cab} corresponding to well geophone depth difference ΔD
- t_o — Accepted time for straight line ray from shot to well geophone. In idealized case t_o would equal tv_1, tha_1 and thb_1
- tc — Vertical time from datum plane to well geophone = $t_o\cos\alpha - t_{sd}$
- Va — Average vertical velocity between datum plane and well geophone = $\frac{D}{tc}$
- Δtc — Difference between tc corresponding to well geophone depth difference ΔD
- Vi — Interval velocity over depth difference ΔD $\left(=\frac{\Delta D}{\Delta tc}\right)$
- Vcab — Logging cable velocity = $\frac{\Delta D}{to_{cab}}$
- T.D. — Total depth of well referred to rotary table Kelly bushing
- ρm — Density of mud in well
- Tm — Temperature of mud returns when circulating in hole.
- B.H.T. — Bottom hole temperature i.e. temperature at T.D.
- Gr. — Grading of certainty and accuracy of time:
  - 1st grade G means: Certain that true formation break selected
  - P " : Some doubt " " " " "
  - 2nd grade G " : Accuracy less than ±·001 seconds
  - F " : " " " ±·003 "
  - P " : " " " ±·005 "
  - ? grade means very doubtful certainty or time

FIELD INSTRUCTIONS:

1. Do not use outer sheath of cable or other neutral lead as geophone lead.
2. Before running geophone in well, shoot buried detonator under well geophone or do tap test to check all connexions and polarity.
3. While running geophone into well fasten small geophone and a clamp to cable and strike a vertical blow on the clamp to check manufacturer's figure for cable velocity.
4. As soon as cable and shallow formation velocities are sufficiently well known, and before survey proceeds, construct calculated cable break curves for all shot-point offsets.
5. Do complete calculation as survey progresses and watch for cable breaks.
6. Where possible obtain copies of C.V.L., electric and lithologic logs and fill in all information required on this sheet.

AFTER G 85 – 113

Geophysical Branch, Bureau of Mineral Resources, Geology and Geophysics. G38-102

To Accompany Record No. 1962/52

PLATE 2A

WELL VELOCITY SURVEY DATA SHEET (SHEET 2).

WELL NAME *PICKANJINNIE No.1* OWNER *ASSOCIATED AUSTRALIAN OILFIELDS N.L.* WELL LOGGING CONTRACTOR *SCHLUMBERGER (AUST.) LTD*

LOCALITY *ROMA AREA, QLD* ADDRESS ADDRESS

COORDINATES *26°35'42"S., 149°07'18"E* DRILLING CONTRACTOR *MINES ADMINISTRATION PTY LTD* TYPE AND NUMBER OF LOGGING UNIT

DATE OF SURVEY *12TH JULY 1960.* ADDRESS LOGGING UNIT OPERATOR

ORGANIZATION SUPERVISING VELOCITY SURVEY — SEISMIC INSTRUMENTS — WELL GEOPHONE

B.M.R. G.+G. MAKE *T.I.C.* MAKE *T.I.C.* B.M.R. REPRESENTATIVE

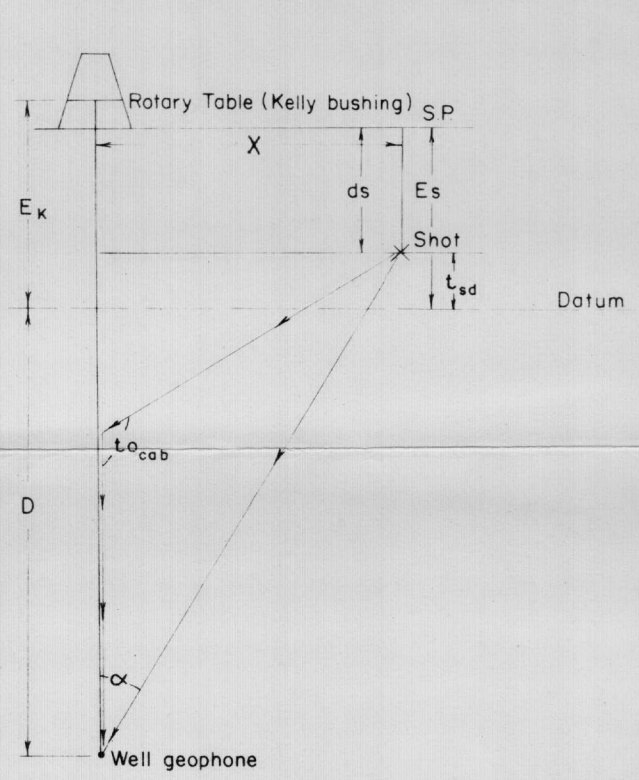
ADDRESS TYPE *MODEL 621* TYPE *3 COMPONENT* DATA CALCULATION *K.B. LODWICK*

SURVEY SUPERVISOR *E.R. SMITH* No

E_K = *69* ft Vo = Ve = *8500* ft/sec Do = *1000* ft ρm = B.H.T. or Tm = Vcab (Manufacturer) = (Test) = Cable Depth Accuracy = ± 1 ft

SN	E_K+D	D	S.P.	X	chge	Es	ds	t_{sd}	α	tv_1. Gr.	tv_2. Gr.	tha_1. Gr.	tha_2. Gr	thb_1. Gr.	thb_2. Gr.	t_{RG} or to_R Gr.	Δt_{RG} or Δto_R	t_{cab}	to_{cab} Gr.	t_o or $t_{sd}/\cos\alpha$	Cos.α	tc	Va	ΔD	Δtc	Vi
1A	800	731	3	1000	20	70	76/84	+2	39°23'	105						468	0	107		107	·773	83				
32G	1428	1359	2	600	5	58	82/84	+3	36°17'	189						982	0	201		192	·806	155				
2B	2000	1931	3	1000	5	70	83/85	+2	17°15'	221						469	-1	211		222	·955	212				
27F	2300	2231	2	600	5	58	82/84	+3	24°04'	261						982	0	266		264	·913	241				
3C	2898	2829	3	1000	10	70	80/84	+2	12°03'		313					470	-2	288	299	307	·978	300				
22E	3450	3381	2	600	5	58	83/85	+3	16°28'	361						982	0	365		364	·959	349				
4D	3450	3381	3	1000	10	70	79/83	+2	9°56'	352						470	-2	336		352	·985	347				
20D	3750	3681	2	600	10	58	80/84	+3	15°38'	385						982	0	391		388	·963	374				
17C	4180	4111	2	600	10	58	80/84	+3	13°35'		426					982	0	429		423	·972	411				
5E	4180	4111	3	1000	10	70	77/82	+2	8°30'	415						471	-3	400		414	·989	409				
13B	4835	4766	2	600	10	58	80/84	+3	11°45'	472						981	+1	485		476	·979	465				
6F	4835	4766	3	1000	10	70	77/81	+2	7°01'	471						471	-3	456	466	470	·992	466				
11A	5218	5149	2	600	20	58	76/84	+3	10°52		502					983	-1	519		498	·982	489				
7A	5218	5149	3	1000	20	70	74/82	+2	6°35'	491						472	-4	490		489	·993	486				

REMARKS: *Reflection times (to_R) of ·982 and ·468 seconds used as reference for all shots fired in shot-holes 2 and 3 respectively.*



LAYOUT OF WELL SHOT-POINTS AND GEOPHONE SPREAD

SCALE IN FEET

DEFINITIONS OF SYMBOLS AND COLUMN HEADINGS:

E_K+D	Depth of well geophone below rotary table Kelly bushing
Do	Elevation of Datum above sea level
E_K	Elevation of rotary table Kelly bushing referred to datum plane
D	Depth of well geophone below datum plane
ΔD	Difference between depths of well geophone for two shots
S.P.	Shot-point
X	Distance of shot-point from centre of well
chge	Pounds weight of explosive fired
Es	Elevation of shot-point referred to datum plane
ds	Depth of shot below surface
Vo	Weathering velocity
Ve	Subweathering velocity
t_{sd}	Vertical time from shot to datum plane. Normally = $\frac{Es-ds}{Ve}$
α	Vertical angle subtended by straight line from shot to well geophone = $\tan^{-1}\frac{X}{D+Es-ds}$
tv_1	Vertical component first break time for well geophone
tv_2	Vertical component first trough time for well geophone
tha_1	Horizontal component A first break time for well geophone
tha_2	Horizontal component A first trough time for well geophone
thb_1	Horizontal component B first break time for well geophone
thb_2	Horizontal component B first trough time for well geophone
RG	Reference geophone
t_{RG}	Reference geophone time
Δt_{RG}	Reference geophone correction time. In general practice $tv_1 - \Delta t_{RG}$ is best estimate of t_o
to_R	Reference reflection time
Δto_R	Reference reflection correction time. In general practice $tv_1 - \Delta to_R$ is best estimate of $t_o - \frac{t_{sd}}{\cos\alpha}$
t_{cab}	Calculated cable break time
to_{cab}	Observed vertical component cable break time
Δto_{cab}	Difference between to_{cab} corresponding to well geophone depth difference ΔD
t_o	Accepted time for straight line ray from shot to well geophone. In idealized case t_o would equal tv_1, tha_1 and thb_1
tc	Vertical time from datum plane to well geophone = $t_o\cos\alpha - t_{sd}$
Va	Average vertical velocity between datum plane and well geophone = $\frac{D}{tc}$
Δtc	Difference between tc corresponding to well geophone depth difference ΔD
Vi	Interval velocity over depth difference ΔD $\left(=\frac{\Delta D}{\Delta tc}\right)$
Vcab	Logging cable velocity = $\frac{\Delta D}{to_{cab}}$
T.D.	Total depth of well referred to rotary table Kelly bushing
ρm	Density of mud in well
Tm	Temperature of mud returns when circulating in hole
B.H.T.	Bottom hole temperature i.e. temperature at T.D.
Gr.	Grading of certainty and accuracy of time:
	1st grade G means: Certain that true formation break selected
	P " : Some doubt " " " " "
	2nd grade G " : Accuracy less than ± ·001 seconds
	F " : " " " ± ·003 "
	P " : " " " ± ·005 "
	? grade means very doubtful certainty or time

FIELD INSTRUCTIONS:

1. Do not use outer sheath of cable or other neutral lead as geophone lead.
2. Before running geophone in well, shoot buried detonator under well geophone or do tap test to check all connexions and polarity.
3. While running geophone into well fasten small geophone and a clamp to cable and strike a vertical blow on the clamp to check manufacturer's figure for cable velocity.
4. As soon as cable and shallow formation velocities are sufficiently well known, and before survey proceeds, construct calculated cable break curves for all shot-point offsets.
5. Do complete calculation as survey progresses and watch for cable breaks.
6. Where possible obtain copies of C.V.L., electric and lithologic logs and fill in all information required on this sheet.

Geophysical Branch, Bureau of Mineral Resources, Geology and Geophysics. G38-103

To Accompany Record No. 1962/53

PLATE 2B

PLATE 3

TIME IN MILLISECONDS

0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500

VELOCITY IN ft/sec

6000 7000 8000 9000 10000 11000 12000 13000 14000 15000 16000 17000 18000 19000 20000 21000 22000 23000

DEPTH IN FEET BELOW DATUM (1000 ft A.S.L.)

0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500

FORMATION BOUNDARIES

WALLOON COAL MEASURES

BUNDAMBA GROUP

MOOLAYEMBER SHALE

SHOWGROUND SS

HOSPITAL HILL SS

PERMIAN ?

PERMIAN

TIMBURY HILLS FORMATION EQUIV.?

VERTICAL TIMES

SLANT TIMES 600 ft FROM BORE (S.P. 1 and 3)

SLANT TIMES 1000 ft FROM BORE (S.P. 2)

FOR CABLE BREAKS 800 ft FROM BORE (VELOCITY OF CABLE ESTIMATED FROM BREAKS 11325 ft/sec)

CB

AVERAGE VELOCITY (V_A)

INTERVAL VELOCITY(V_I)

LEGEND

- △ S.P. 1 (600 ft NORTH OF BORE) SLANT TIME
- ● " " " " VERTICAL TIME
- × S.P. 2 (1000 ft NORTH OF BORE) SLANT TIME
- ⊗ " " " " VERTICAL TIME
- • S.P. 3 (600 ft SOUTH OF BORE) SLANT TIME
- ⊖ " " " " VERTICAL TIME

CB PROBABLE CABLE BREAKS

WELL GEOPHONE TIMES, AVERAGE AND INTERVAL VELOCITIES, AND FORMATION BOUNDARIES IN RELATION TO DEPTH

AAO PICKANJINNIE No 1

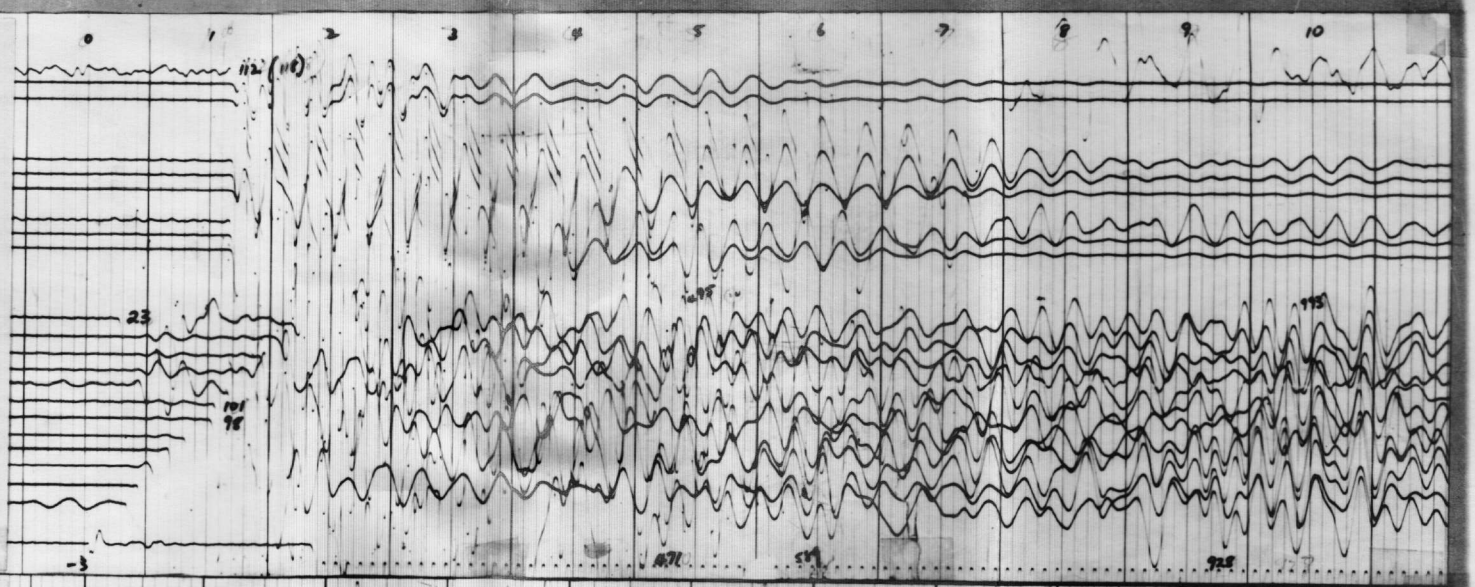
Geophysical Branch, Bureau of Mineral Resources, Geology and Geophysics G 38-82

To Accompany Record No 1962/52

BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 800'
VERTICAL COMPONENT: No 1 - HIGH, No 2 - MEDIUM, No 3 - LOW
HORIZONTAL COMPONENT No 1: No 4 - HIGH, No 5 - MEDIUM, No 6 - LOW
HORIZONTAL COMPONENT No 2: No 7 - HIGH, No 8 - MEDIUM, No 9 - LOW
FILTER: L2H3 A.G.C.: C
SP: 1B **SP POSITION:** 600' NORTH OF WELL
SHOT: 34Q CHARGE: 11 DEPTH: 60/64
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

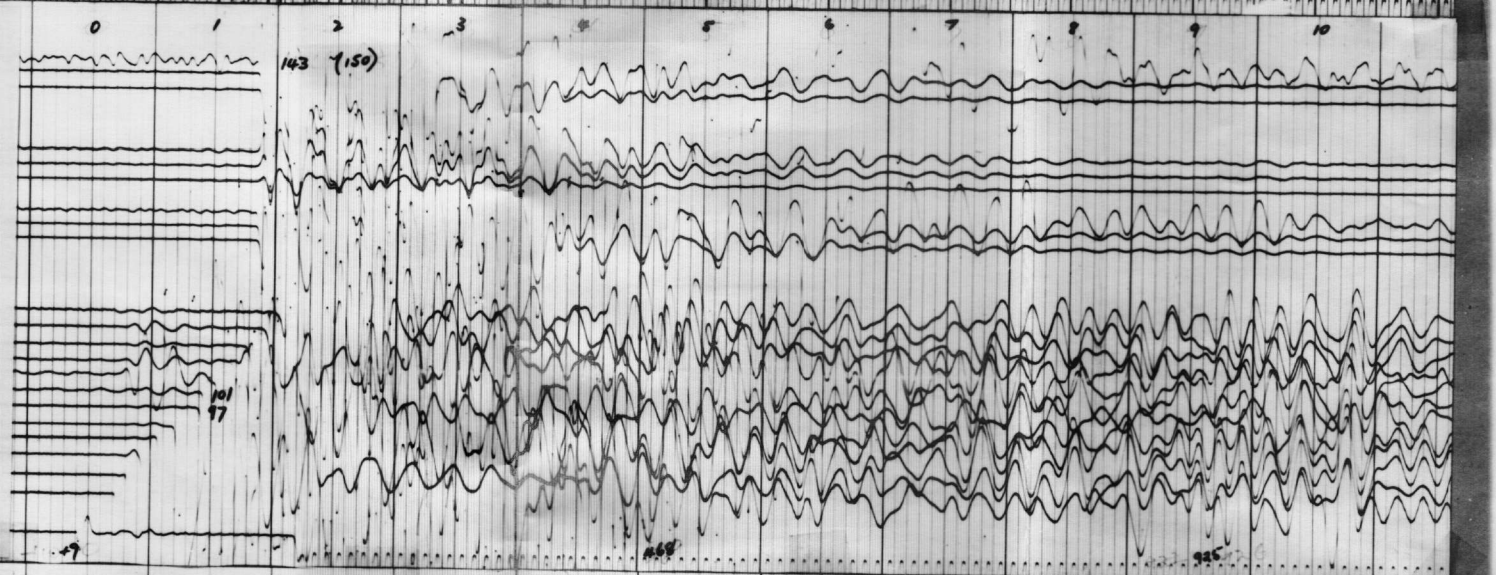
WELL VELOCITY SURVEY

WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 800'
VERTICAL COMPONENT: No 1 - HIGH, No 2 - MEDIUM, No 3 - LOW
HORIZONTAL COMPONENT No 1: No 4 - HIGH, No 5 - MEDIUM, No 6 - LOW
HORIZONTAL COMPONENT No 2: No 7 - HIGH, No 8 - MEDIUM, No 9 - LOW
FILTER: L2H4 A.G.C.: C
SP: 3A **SP POSITION:** 600' SOUTH OF WELL
SHOT: 1A CHARGE: 20 DEPTH: 76/84
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: 60% A.G.C.: C PRESUPP: 20%
REMARKS: NO T.B SUPP. TRIPPED EARLY.
TIMED FROM RECORD 2B ALLOWING 1mS. FOR HOLE FATIGUE

BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

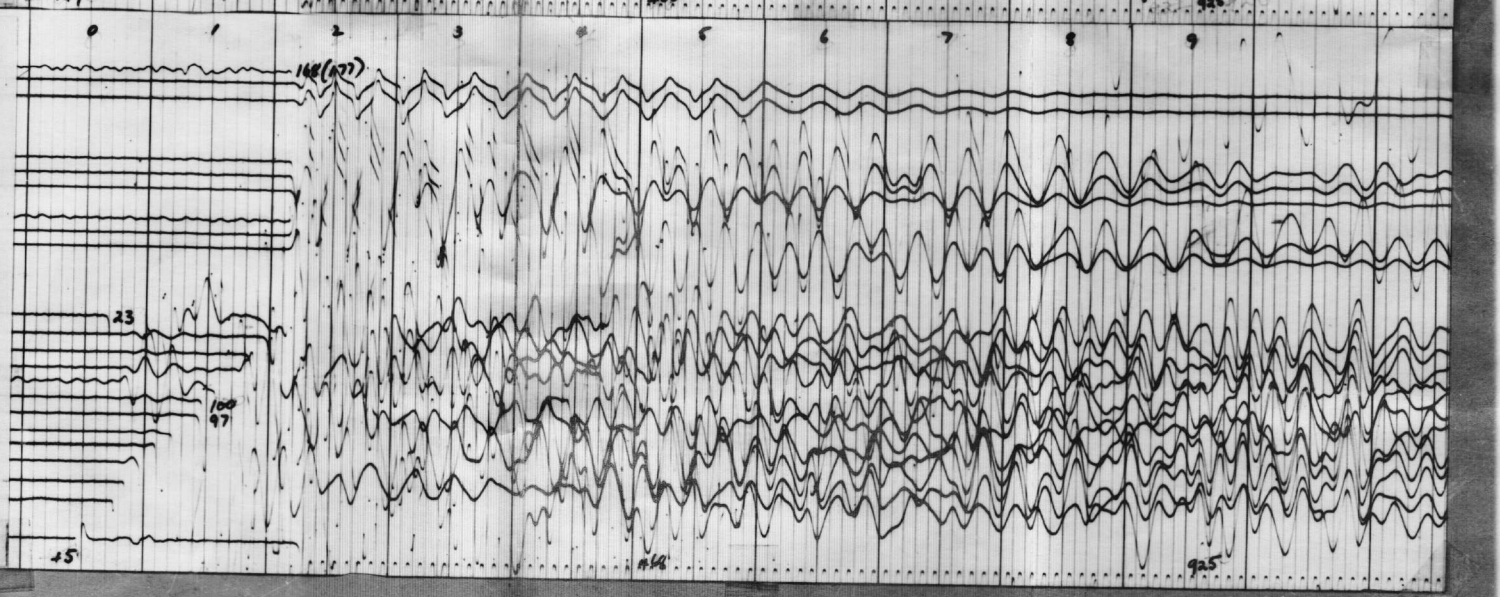
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 1150'
VERTICAL COMPONENT: No 1 - HIGH, No 2 - MEDIUM, No 3 - LOW
HORIZONTAL COMPONENT No 1: No 4 - HIGH, No 5 - MEDIUM, No 6 - LOW
HORIZONTAL COMPONENT No 2: No 7 - HIGH, No 8 - MEDIUM, No 9 - LOW
FILTER: L2H3 A.G.C.: C
SP: 1B **SP POSITION:** 600' NORTH OF WELL
SHOT: 33P CHARGE: 11 DEPTH: 64/68
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP: 20%
REMARKS: NO UPHOLE TIME



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

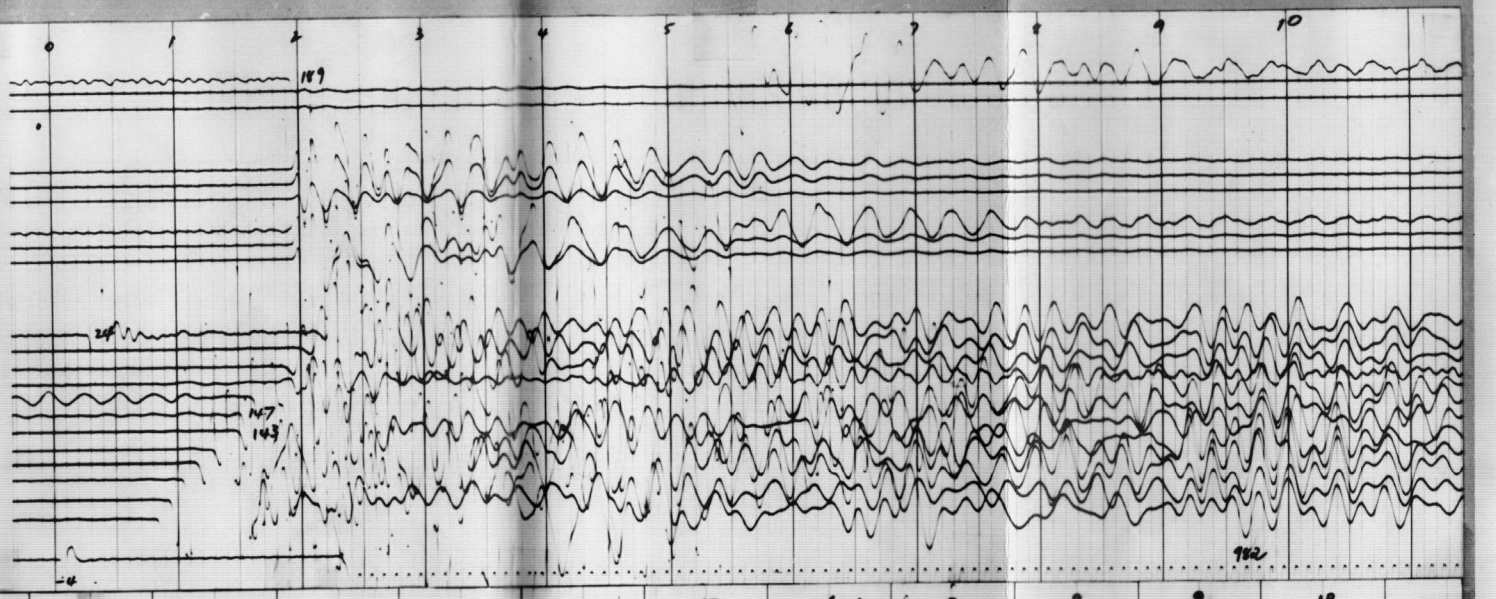
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 1428'
VERTICAL COMPONENT: No 1 - HIGH, No 2 - MEDIUM, No 3 - LOW
HORIZONTAL COMPONENT No 1: No 4 - HIGH, No 5 - MEDIUM, No 6 - LOW
HORIZONTAL COMPONENT No 2: No 7 - HIGH, No 8 - MEDIUM, No 9 - LOW
FILTER: L2H3 A.G.C.: C
SP: 1B **SP POSITION:** 600' NORTH OF WELL
SHOT: 31N CHARGE: 11 DEPTH: 65/69
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

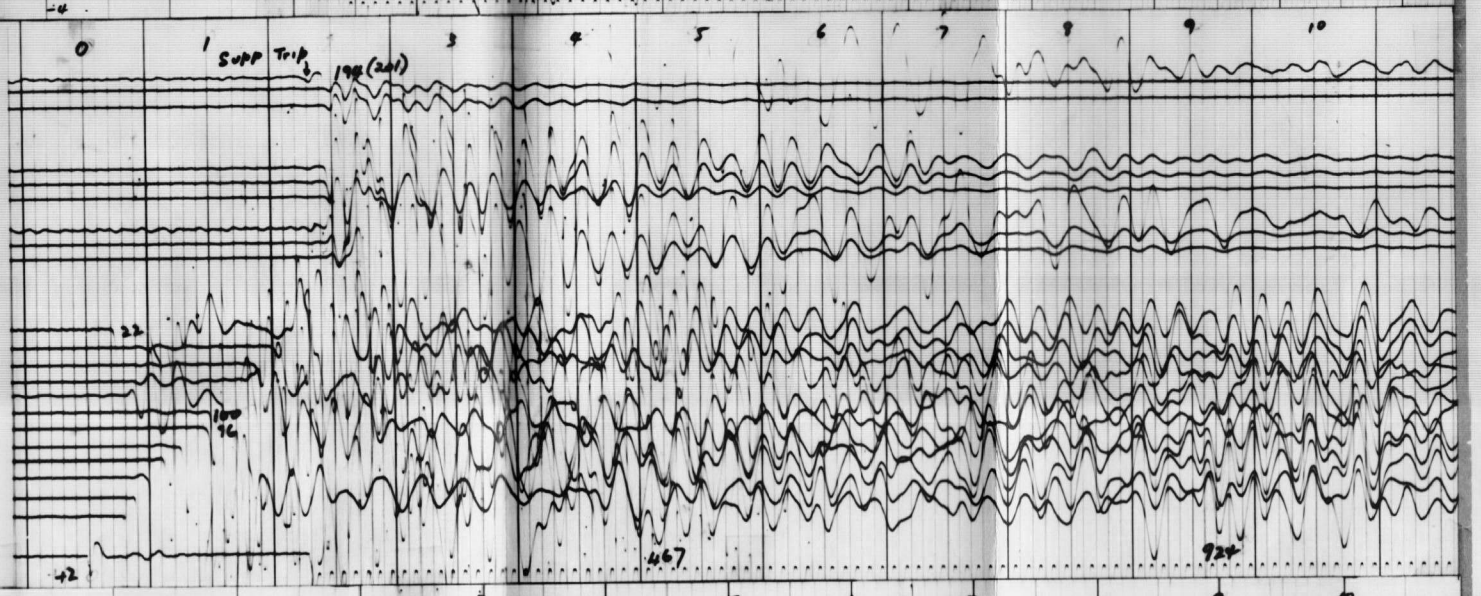
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 1428'
VERTICAL COMPONENT: No 1-HIGH, No 2-MEDIUM, No 3-LOW
HORIZONTAL COMPONENT No 1: No 4-HIGH, No 5-MEDIUM, No 6-LOW
HORIZONTAL COMPONENT No 2: No 7-HIGH, No 8-MEDIUM, No 9-LOW
FILTER: L2H3 A.G.C.: C
SP: 2A **SP POSITION:** 1000' NORTH OF WELL
SHOT: 32G CHARGE: 5 DEPTH: 82/84
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

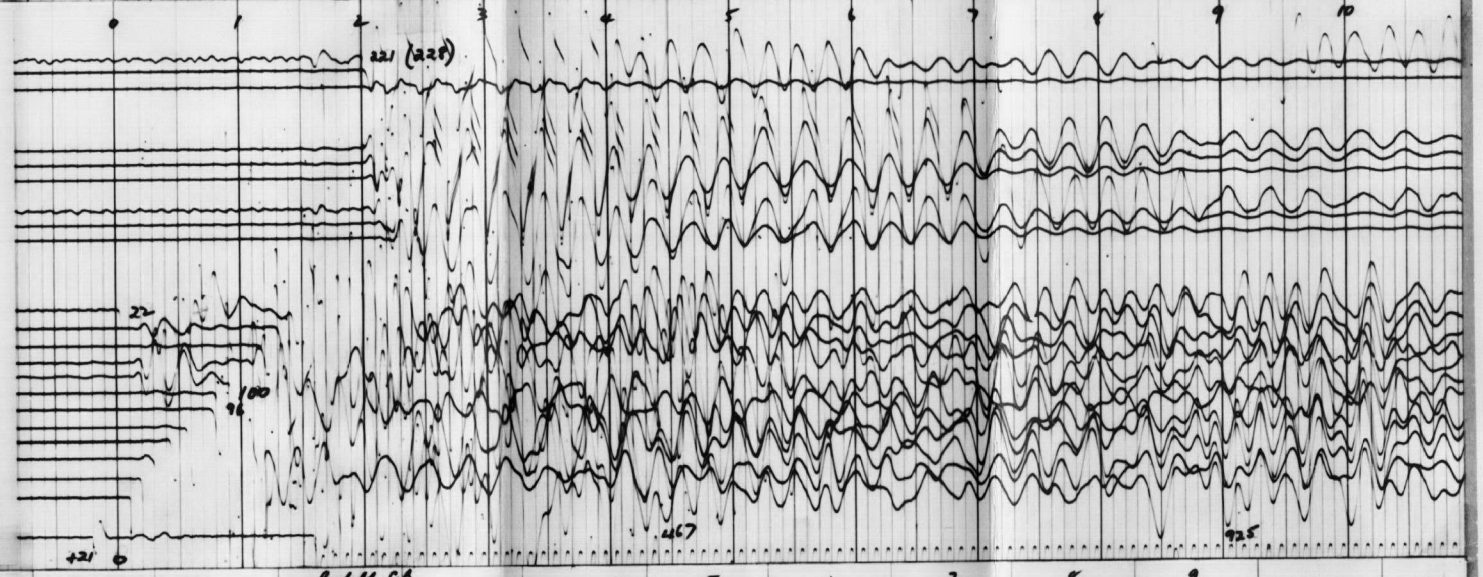
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 1700'
VERTICAL COMPONENT: No 1-HIGH, No 2-MEDIUM, No 3-LOW
HORIZONTAL COMPONENT No 1: No 4-HIGH, No 5-MEDIUM, No 6-LOW
HORIZONTAL COMPONENT No 2: No 7-HIGH, No 8-MEDIUM, No 9-LOW
FILTER: L2H3 A.G.C.: C
SP: 1B **SP POSITION:** 600' NORTH OF WELL
SHOT: 30M CHARGE: 11 DEPTH: 65/69
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

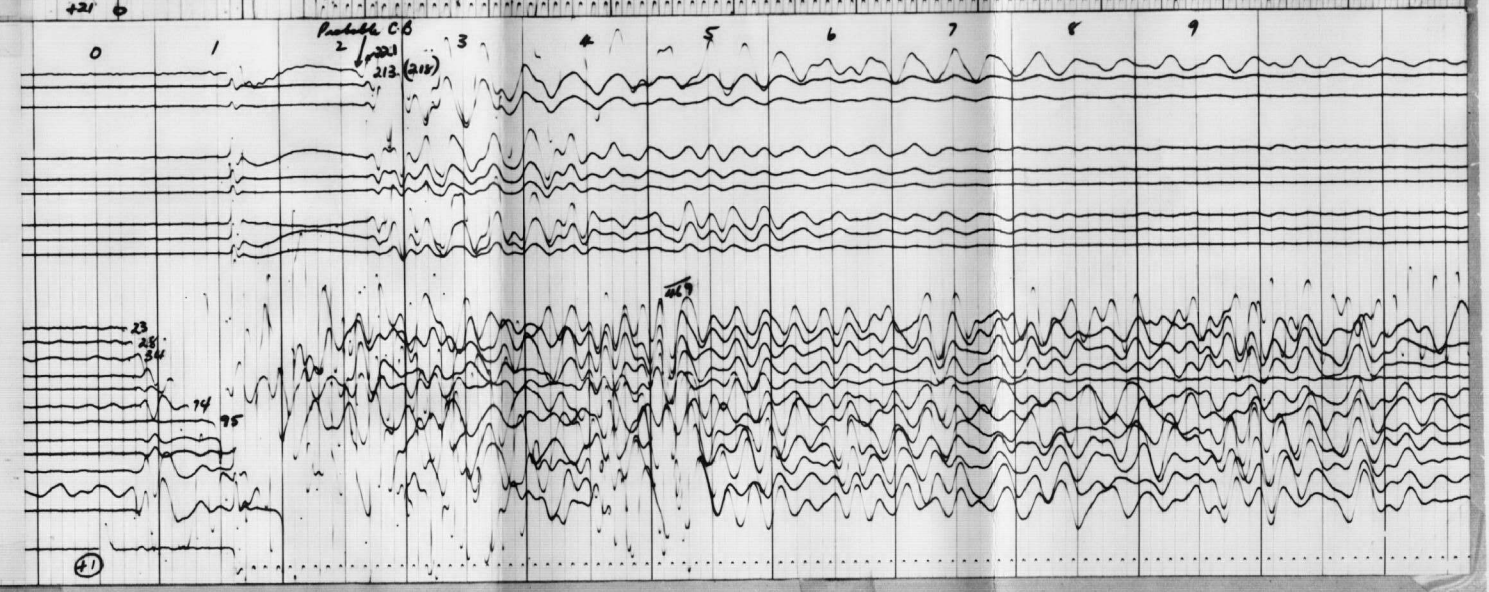
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 2000'
VERTICAL COMPONENT: No 1-HIGH, No 2-MEDIUM, No 3-LOW
HORIZONTAL COMPONENT No 1: No 4-HIGH, No 5-MEDIUM, No 6-LOW
HORIZONTAL COMPONENT No 2: No 7-HIGH, No 8-MEDIUM, No 9-LOW
FILTER: L2H3 A.G.C.: C
SP: 1B **SP POSITION:** 600' NORTH OF WELL
SHOT: 29L CHARGE: 11 DEPTH: 68/72
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

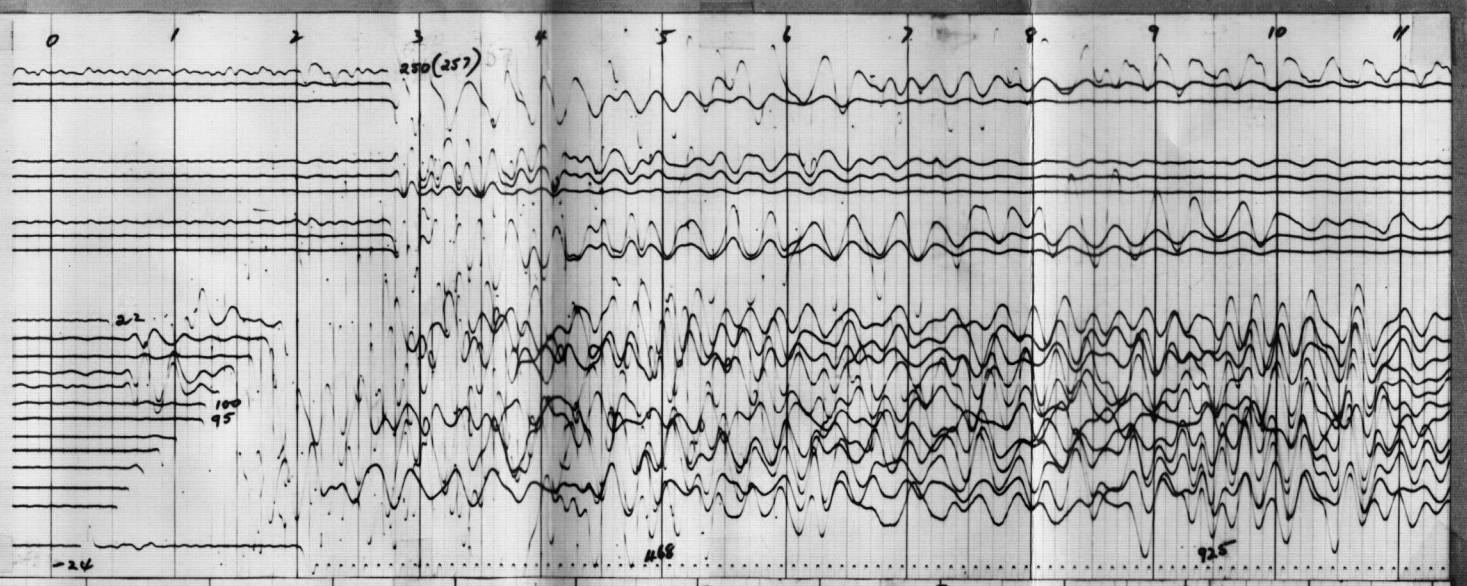
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 2000'
VERTICAL COMPONENT: No 1-HIGH, No 2-MEDIUM, No 3-LOW
HORIZONTAL COMPONENT No 1: No 4-HIGH, No 5-MEDIUM, No 6-LOW
HORIZONTAL COMPONENT No 2: No 7-HIGH, No 8-MEDIUM, No 9-LOW
FILTER: L2H4 A.G.C.: C
SP: 3A **SP POSITION:** 600' SOUTH OF SP
SHOT: 2B CHARGE: 5 DEPTH: 83/85
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: 60% A.G.C.: C PRESUPP: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

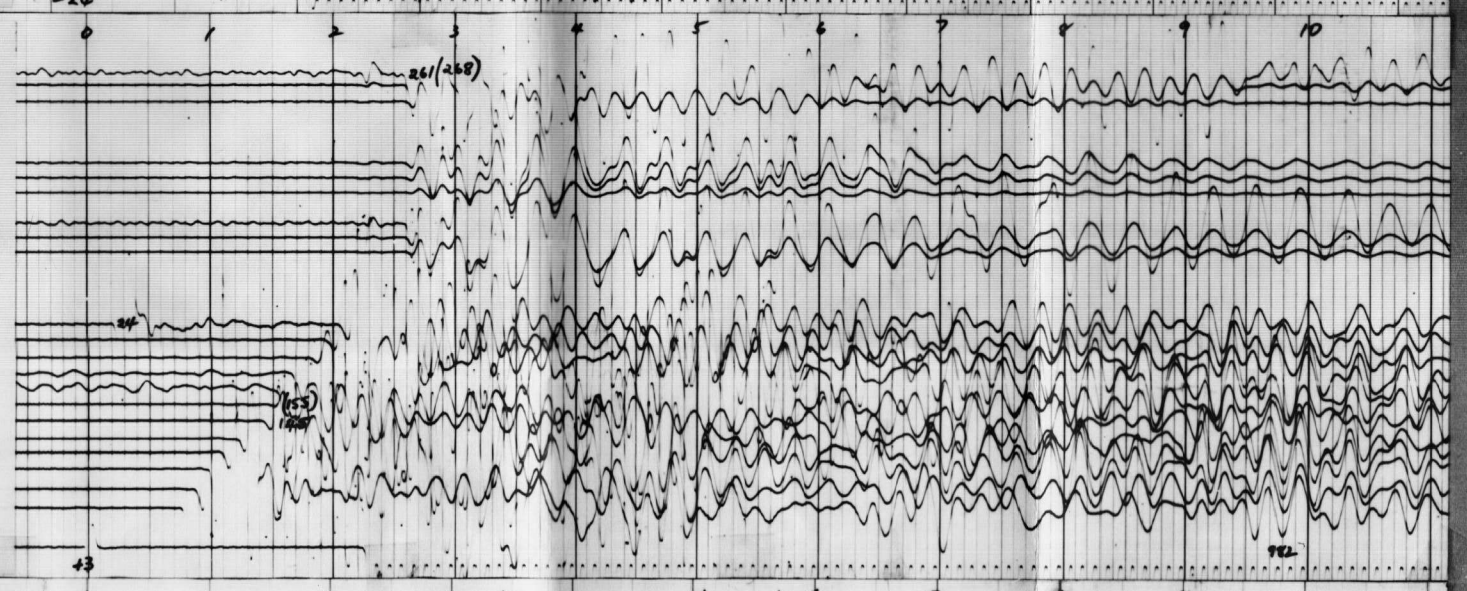
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 2300'
VERTICAL COMPONENT: No 1-HIGH, No 2-MEDIUM, No 3-LOW
HORIZONTAL COMPONENT No 1: No 4-HIGH, No 5-MEDIUM, No 6-LOW
HORIZONTAL COMPONENT No 2: No 7-HIGH, No 8-MEDIUM, No 9-LOW
FILTER: L2H3 A.G.C.: C
SP: 1B **SP POSITION:** 600' NORTH OF WELL
SHOT: 28K CHARGE: 11 DEPTH: 68/72
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

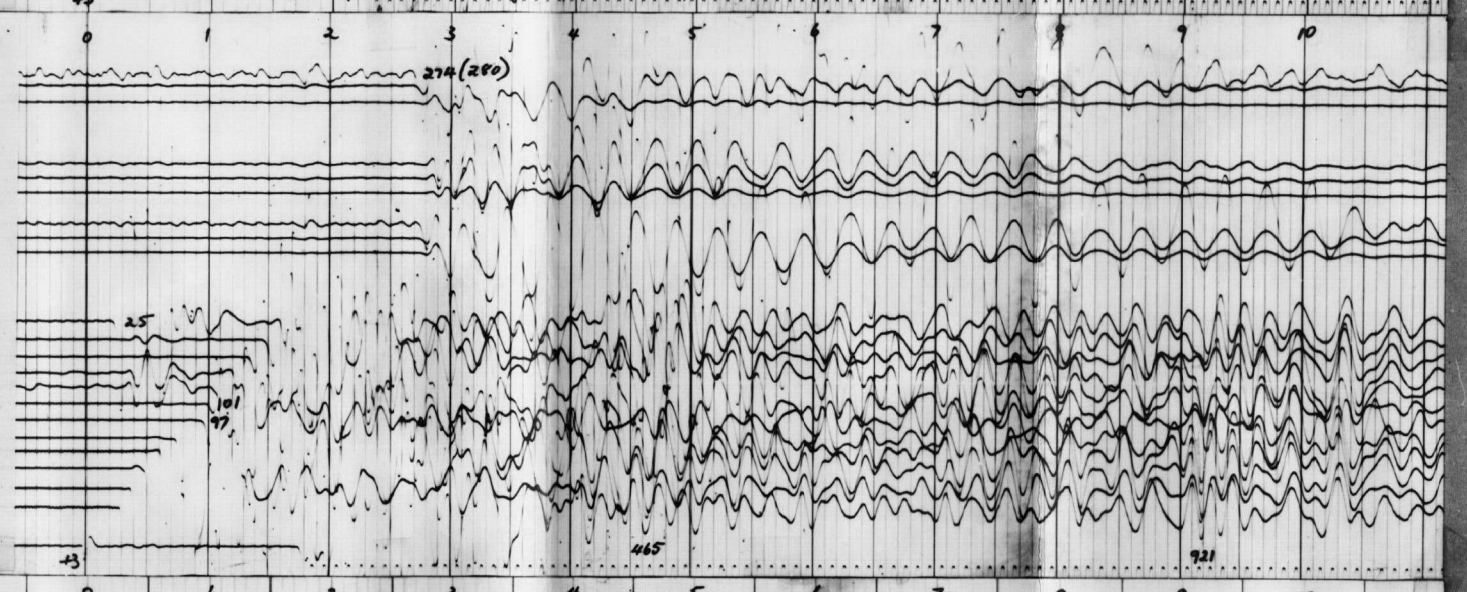
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 2300'
VERTICAL COMPONENT: No 1-HIGH, No 2-MEDIUM, No 3-LOW
HORIZONTAL COMPONENT No 1: No 4-HIGH, No 5-MEDIUM, No 6-LOW
HORIZONTAL COMPONENT No 2: No 7-HIGH, No 8-MEDIUM, No 9-LOW
FILTER: L2H3 A.G.C.: C
SP: 2A **SP POSITION:** 1000' NORTH OF WELL
SHOT: 27F CHARGE: 5 DEPTH: 82/84
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C • PRESUPP: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

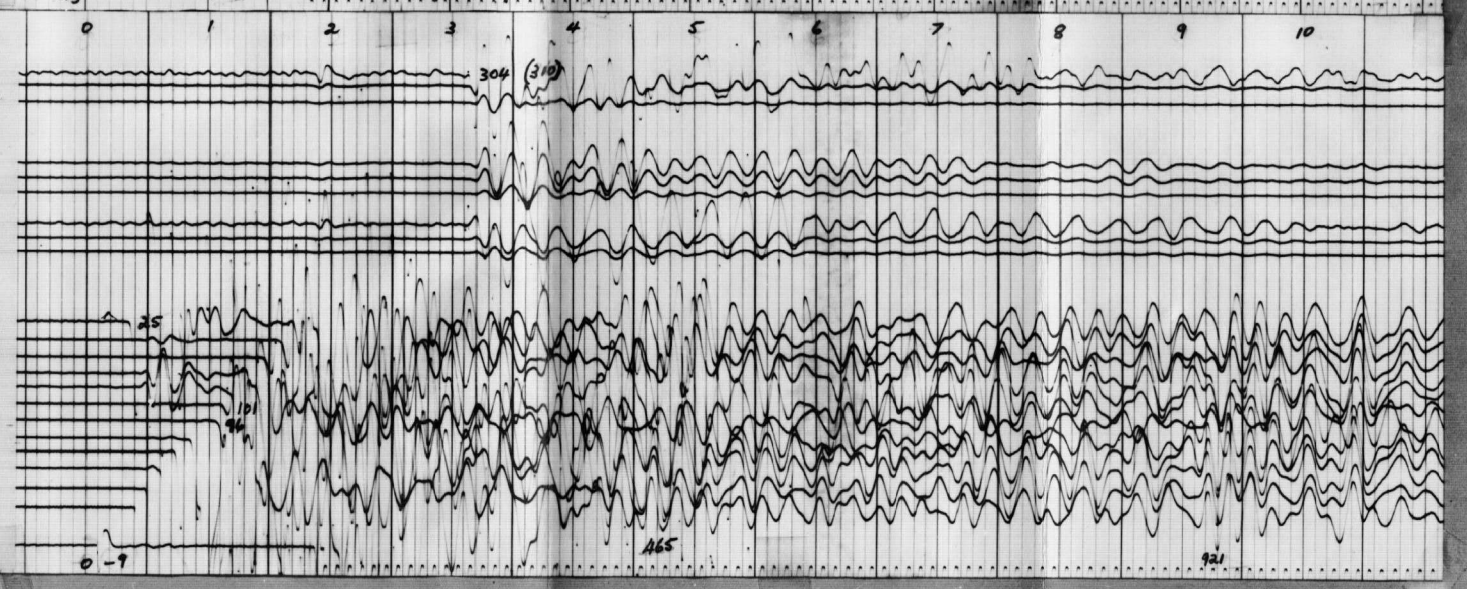
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 2600'
VERTICAL COMPONENT: No 1-HIGH, No 2-MEDIUM, No 3-LOW
HORIZONTAL COMPONENT No 1: No 4-HIGH, No 5-MEDIUM, No 6-LOW
HORIZONTAL COMPONENT No 2: No 7-HIGH, No 8-MEDIUM, No 9-LOW
FILTER: L2H3 A.G.C.: C
SP: 1B **SP POSITION:** 600' NORTH OF WELL
SHOT: 26J CHARGE: 11 DEPTH: 71/75
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 2898'
VERTICAL COMPONENT: No 1-HIGH, No 2-MEDIUM, No 3-LOW
HORIZONTAL COMPONENT No 1: No 4-HIGH, No 5-MEDIUM, No 6-LOW
HORIZONTAL COMPONENT No 2: No 7-HIGH, No 8-MEDIUM, No 9-LOW
FILTER: L2H3 A.G.C.: C
SP: 1B **SP POSITION:** 600' NORTH OF WELL
SHOT: 25L CHARGE: 11 DEPTH: 74/78
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP: 20%
REMARKS:

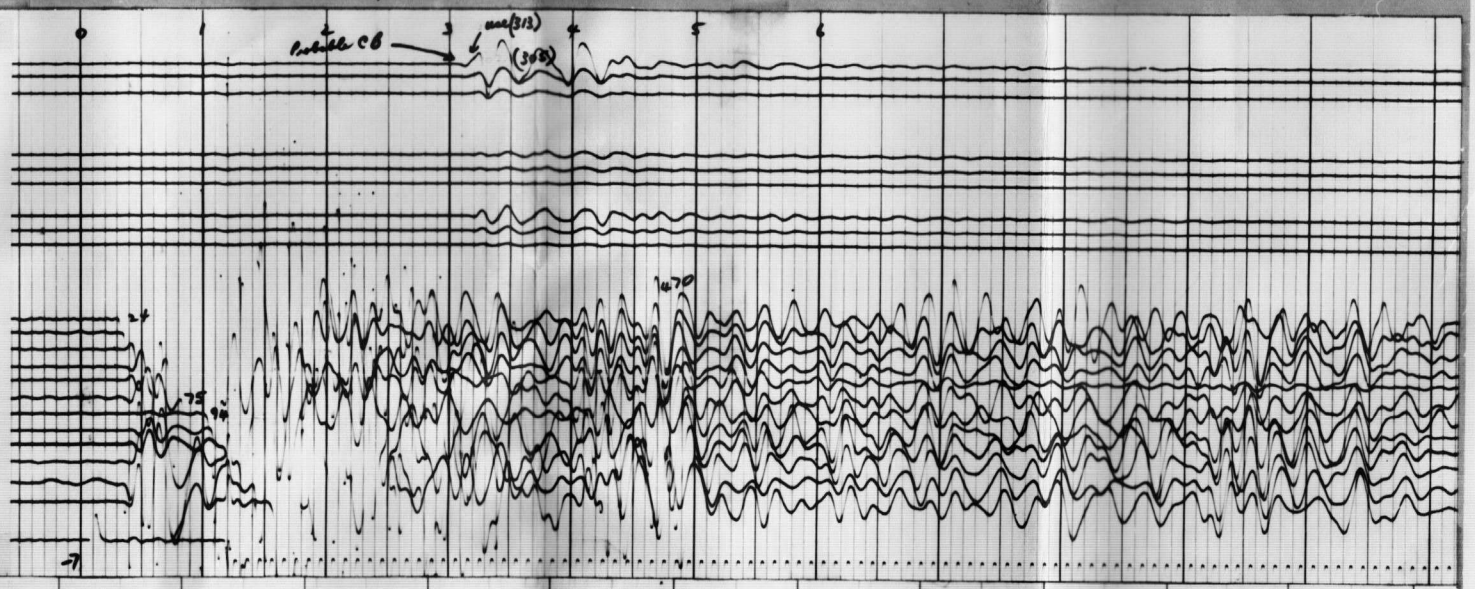


Geophysical Branch, Bureau of Mineral Resources, Geology and Geophysics. G38-89

BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

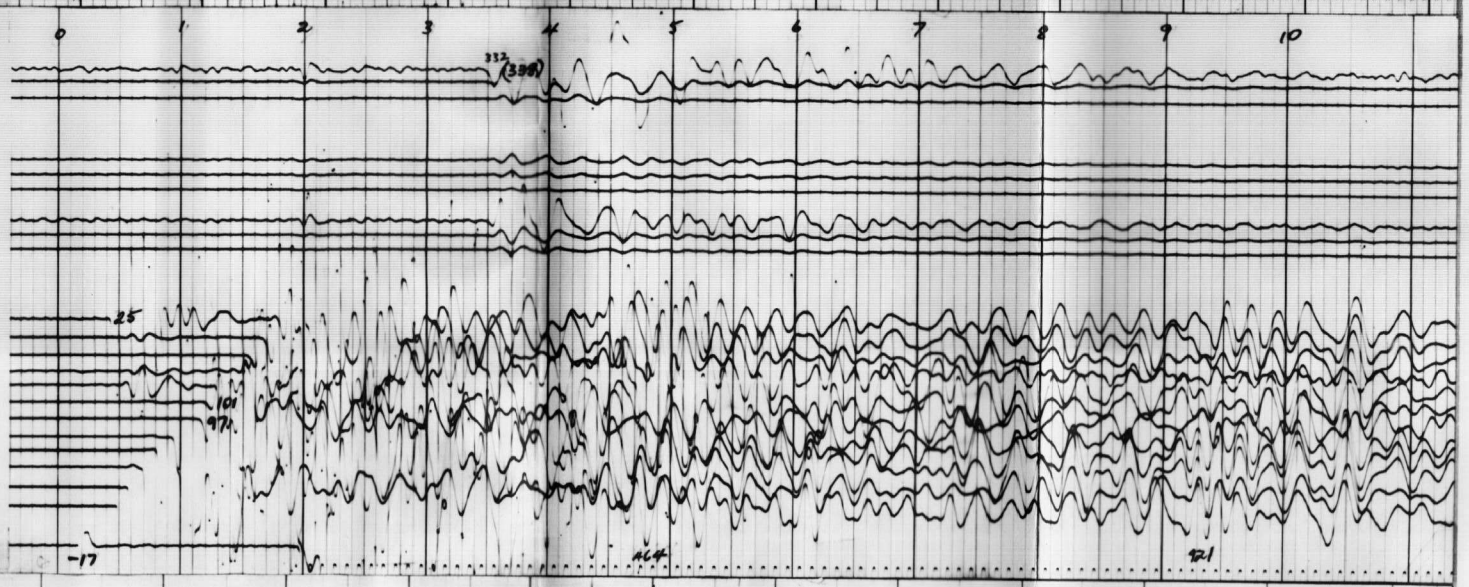
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 2898'
VERTICAL COMPONENT: No 1-HIGH, No 2-MEDIUM, No 3-LOW
HORIZONTAL COMPONENT No 1: No 4-HIGH, No 5-MEDIUM, No 6-LOW
HORIZONTAL COMPONENT No 2: No 7-HIGH, No 8-MEDIUM, No 9-LOW
FILTER: L2H4 A.G.C.: C,
SP: 3A **SP POSITION:** 600' SOUTH OF WELL
SHOT: 3C CHARGE: 10 DEPTH: 80/84
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: 60% A.G.C.: C PRESUPP: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

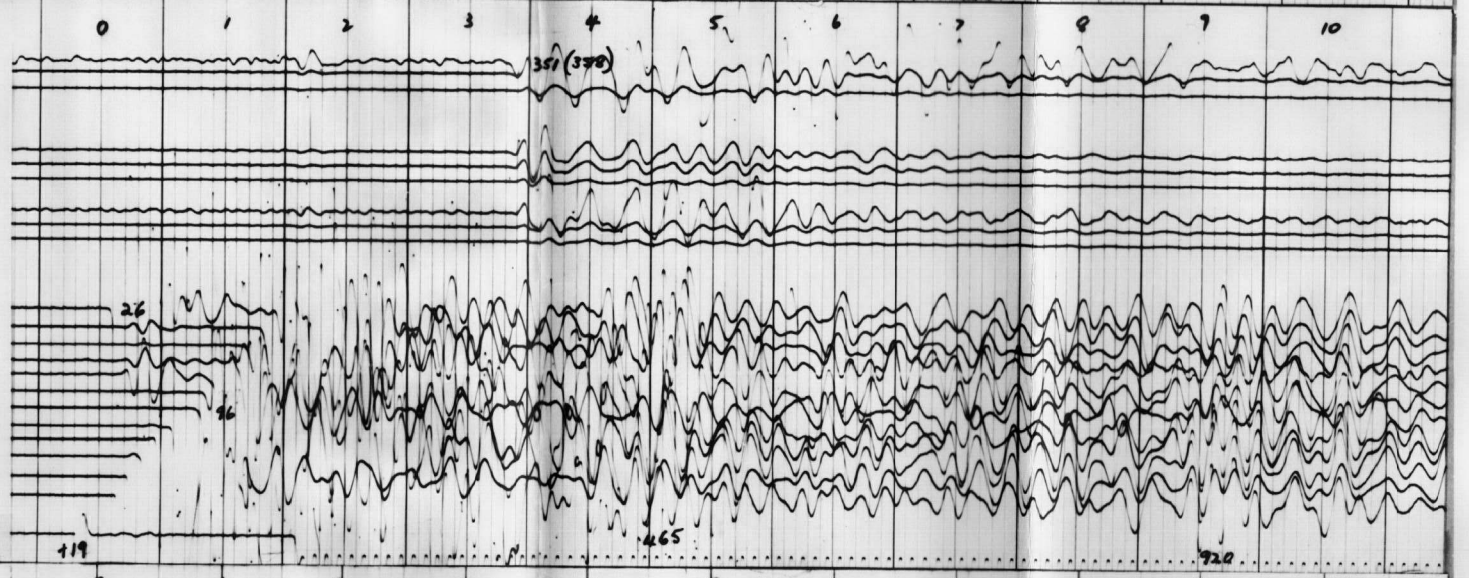
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 3200'
VERTICAL COMPONENT: No 1-HIGH, No 2-MEDIUM, No 3-LOW
HORIZONTAL COMPONENT No 1: No 4-HIGH, No 5-MEDIUM, No 6-LOW
HORIZONTAL COMPONENT No 2: No 7-HIGH, No 8-MEDIUM, No 9-LOW
FILTER: L2H3 A.G.C.: C
SP: 1B **SP POSITION:** 600' NORTH OF WELL
SHOT: 24H CHARGE: 7½ DEPTH: 78/81
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

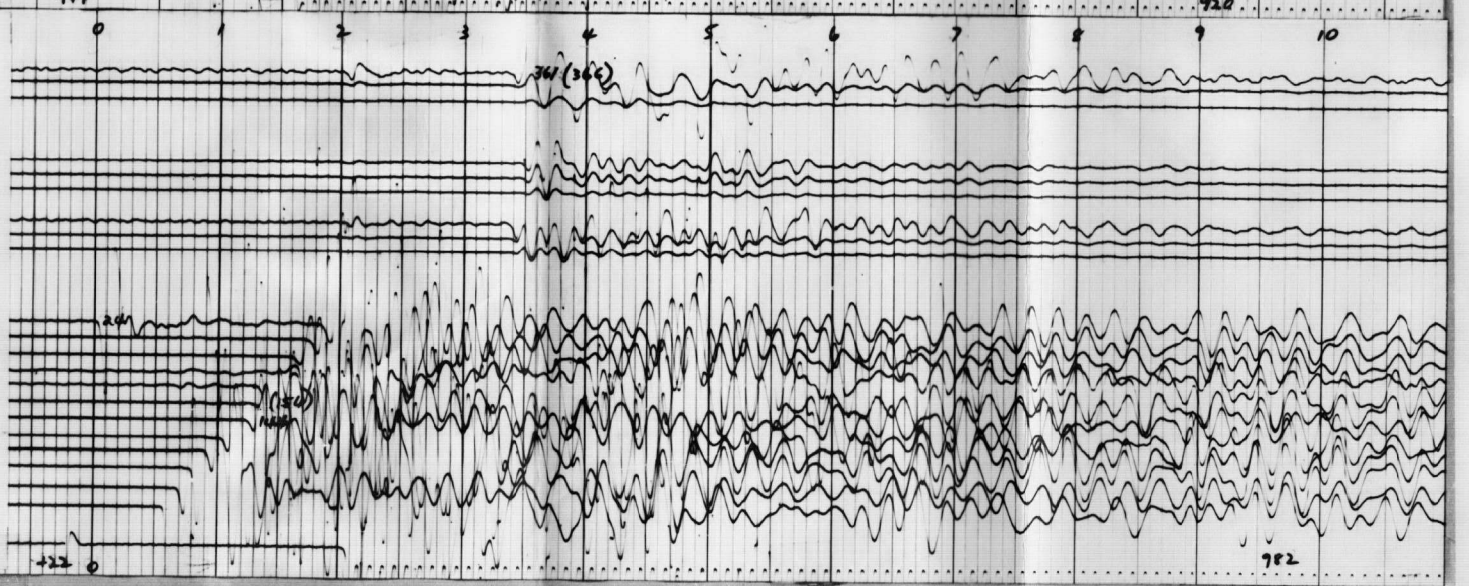
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 3450'
VERTICAL COMPONENT: No 1-HIGH, No 2-MEDIUM, No 3-LOW
HORIZONTAL COMPONENT No 1: No 4-HIGH, No 5-MEDIUM, No 6-LOW
HORIZONTAL COMPONENT No 2: No 7-HIGH, No 8-MEDIUM, No 9-LOW
FILTER: L2H3 A.G.C.: C
SP: 1B **SP POSITION:** 600' NORTH OF WELL
SHOT: 23G CHARGE: 10 DEPTH: 78/82
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

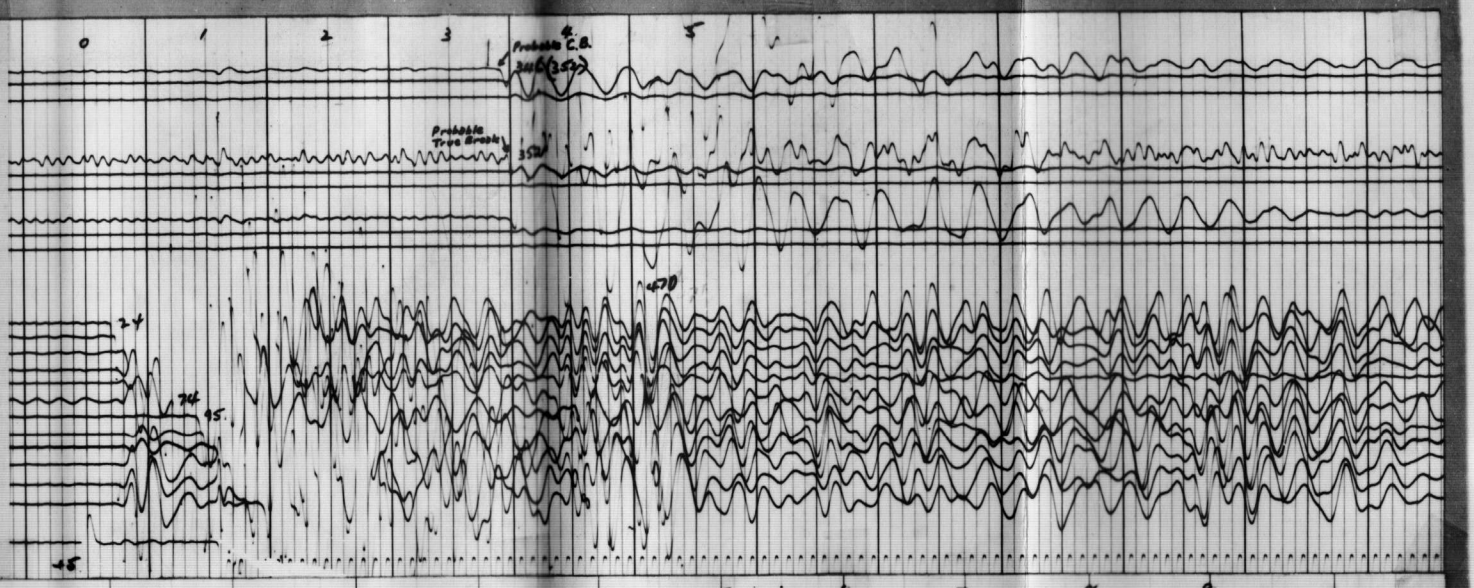
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 3450'
VERTICAL COMPONENT: No 1-HIGH, No 2-MEDIUM, No 3-LOW
HORIZONTAL COMPONENT No 1: No 4-HIGH, No 5-MEDIUM, No 6-LOW
HORIZONTAL COMPONENT No 2: No 7-HIGH, No 8-MEDIUM, No 9-LOW
FILTER: L2H3 A.G.C.: C
SP: 2A **SP POSITION:** 1000' NORTH OF WELL
SHOT: 22E CHARGE: 5 DEPTH: 83/85
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

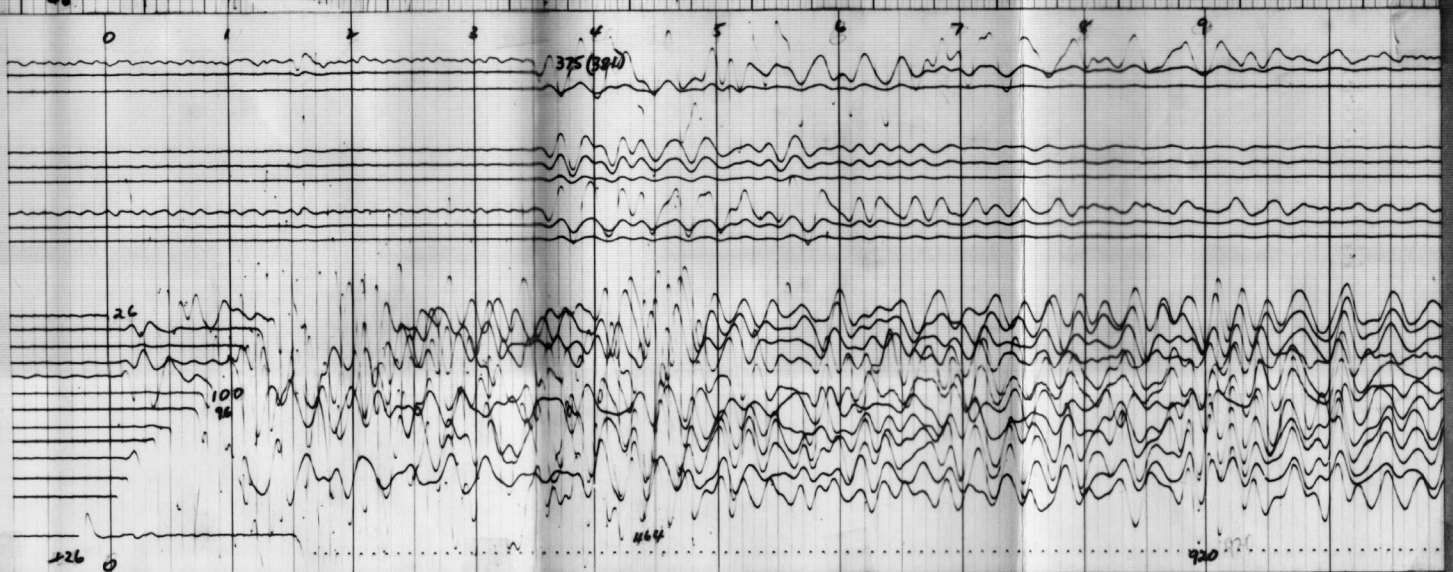
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 3450'
VERTICAL COMPONENT: No 1-HIGH, No 2-MEDIUM, No 3-LOW
HORIZONTAL COMPONENT No 1: No 4-HIGH, No 5-MEDIUM, No 6-LOW
HORIZONTAL COMPONENT No 2: No 7-HIGH, No 8-MEDIUM, No 9-LOW
FILTER: L2H4 A.G.C.: C
SP: 3A **SP POSITION:** 600' SOUTH OF WELL
SHOT: 4D CHARGE: 10 DEPTH: 79/83
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP.: 20%
REMARKS: NO SUPP. ON WELL PHONE



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

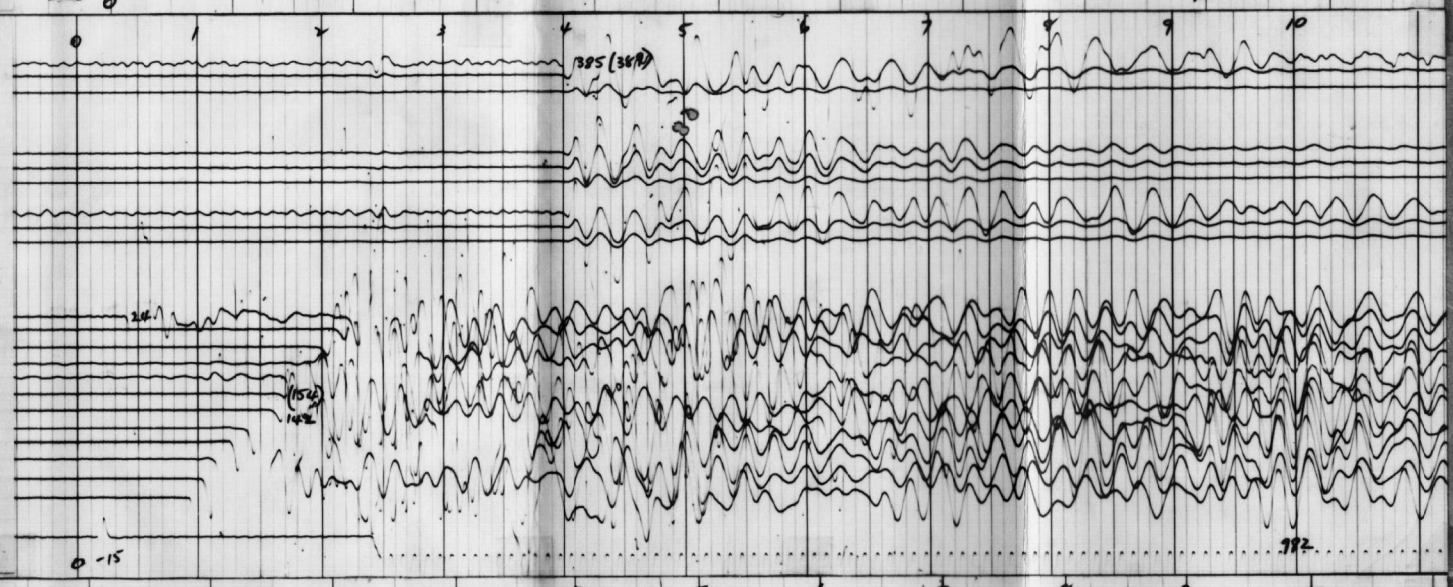
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 3750'
VERTICAL COMPONENT: No 1-HIGH, No 2-MEDIUM, No 3-LOW
HORIZONTAL COMPONENT No 1: No 4-HIGH, No 5-MEDIUM, No 6-LOW
HORIZONTAL COMPONENT No 2: No 7-HIGH, No 8-MEDIUM, No 9-LOW
FILTER: L2H3 A.G.C.: C
SP: 1B **SP POSITION:** 600' NORTH OF WELL
SHOT: 21F CHARGE: 10 DEPTH: 78/82
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP.: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

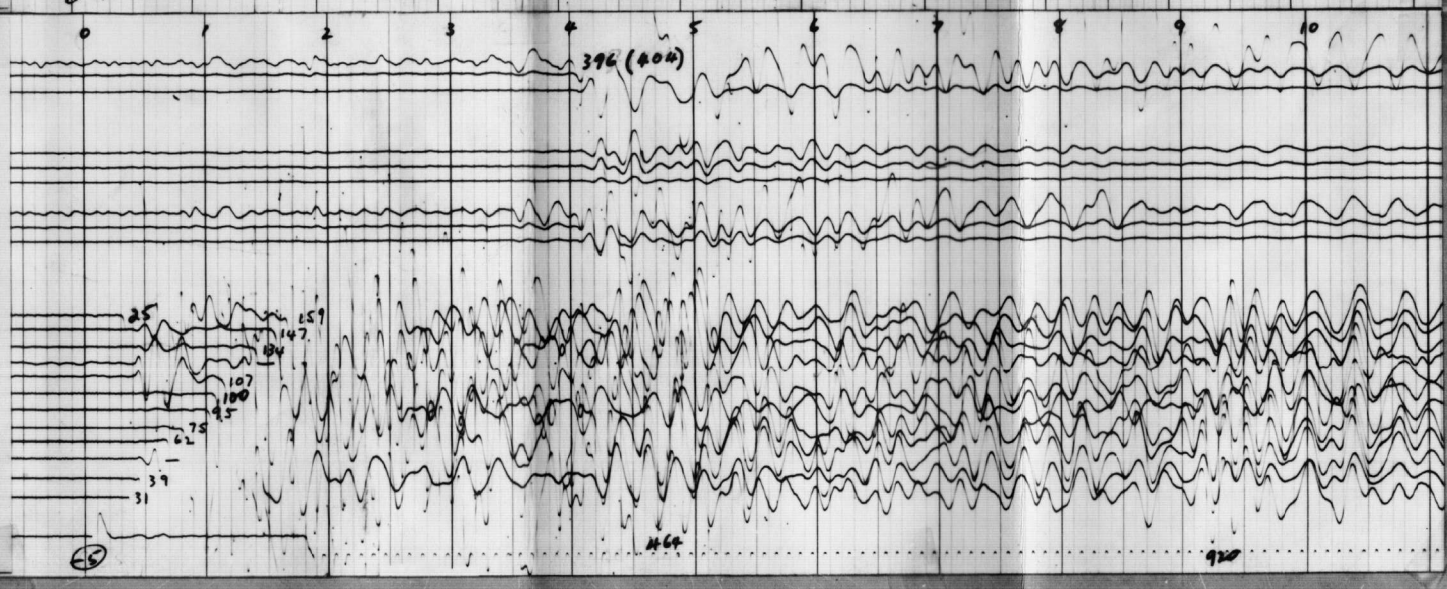
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 3750'
VERTICAL COMPONENT: No 1-HIGH, No 2-MEDIUM, No 3-LOW
HORIZONTAL COMPONENT No 1: No 4-HIGH, No 5-MEDIUM, No 6-LOW
HORIZONTAL COMPONENT No 2: No 7-HIGH, No 8-MEDIUM, No 9-LOW
FILTER: L2H3 A.G.C.: C
SP: 2A **SP POSITION:** 1000' NORTH OF WELL
SHOT: 20D CHARGE: 10 DEPTH: 80/84
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP.: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

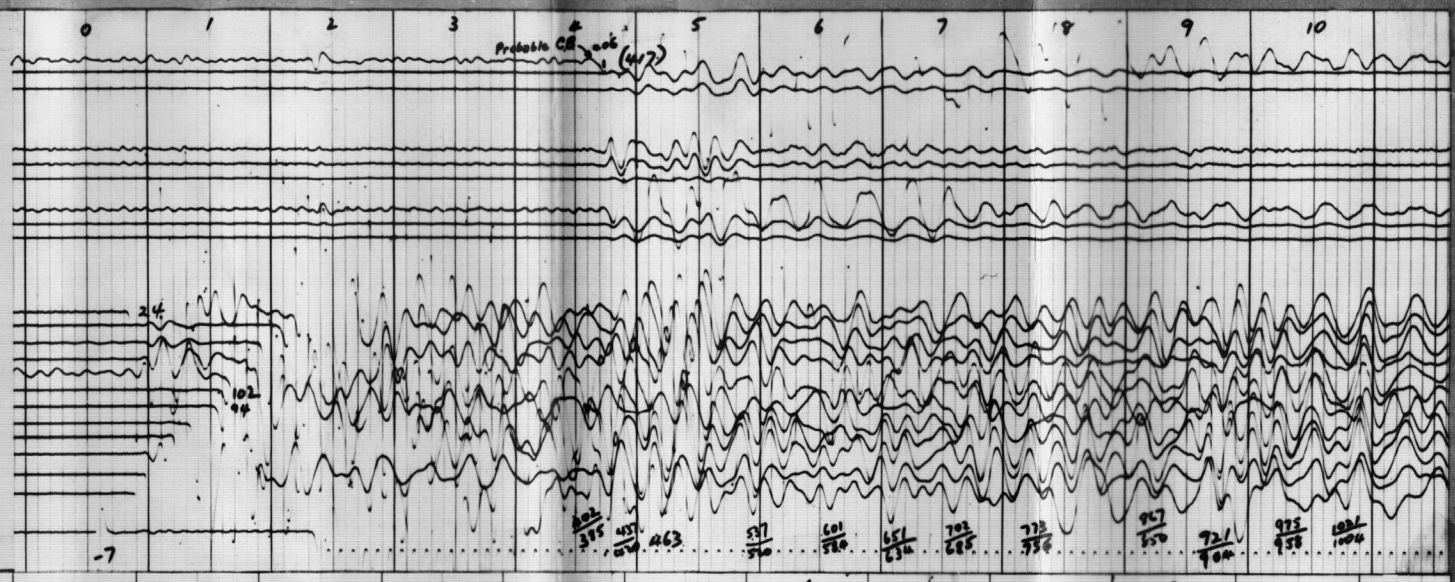
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 4007'
VERTICAL COMPONENT: No 1-HIGH, No 2-MEDIUM, No 3-LOW
HORIZONTAL COMPONENT No 1: No 4-HIGH, No 5-MEDIUM, No 6-LOW
HORIZONTAL COMPONENT No 2: No 7-HIGH, No 8-MEDIUM, No 9-LOW
FILTER: L2H3 A.G.C.: C
SP: 1B **SP POSITION:** 600' NORTH OF WELL
SHOT: 19E CHARGE: 10 DEPTH: 80/84
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP.: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

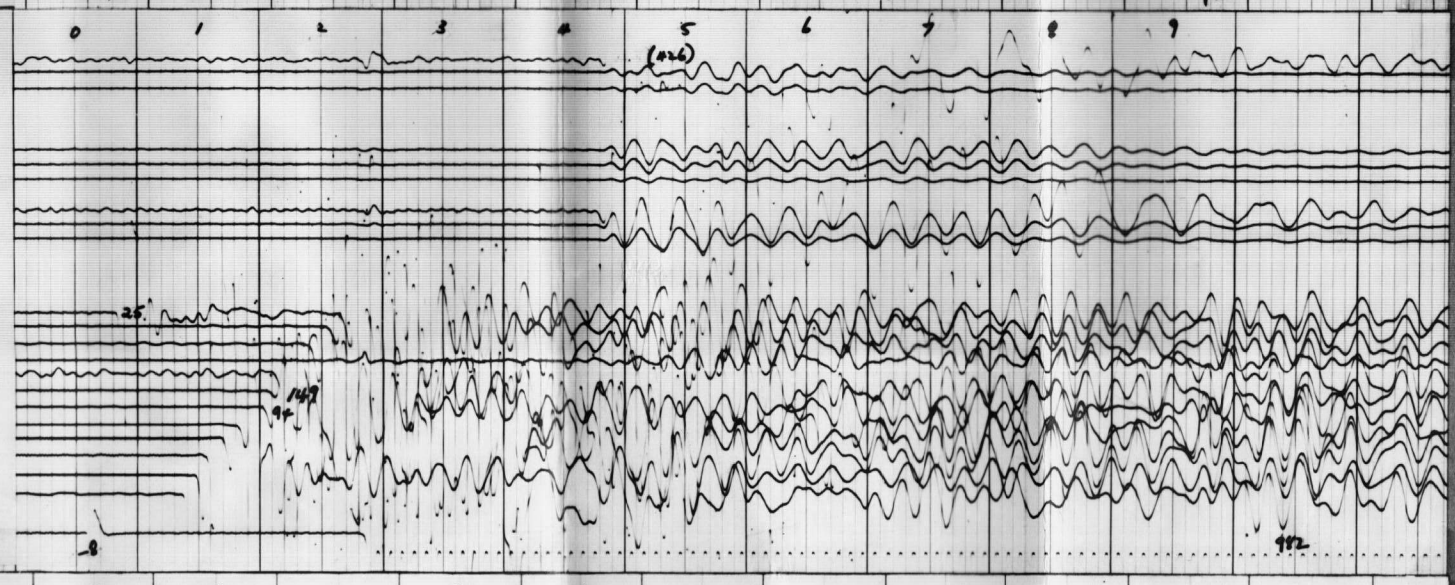
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 4180'
VERTICAL COMPONENT: No 1 - HIGH, No 2 - MEDIUM, No 3 - LOW
HORIZONTAL COMPONENT No 1: No 4 - HIGH, No 5 - MEDIUM, No 6 - LOW
HORIZONTAL COMPONENT No 2: No 7 - HIGH, No 8 - MEDIUM, No 9 - LOW
FILTER: L2H3 A.G.C.: C
SP: 1B **SP POSITION:** 600' NORTH OF WELL
SHOT: 16C CHARGE: 15 DEPTH: 80/86
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP.: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

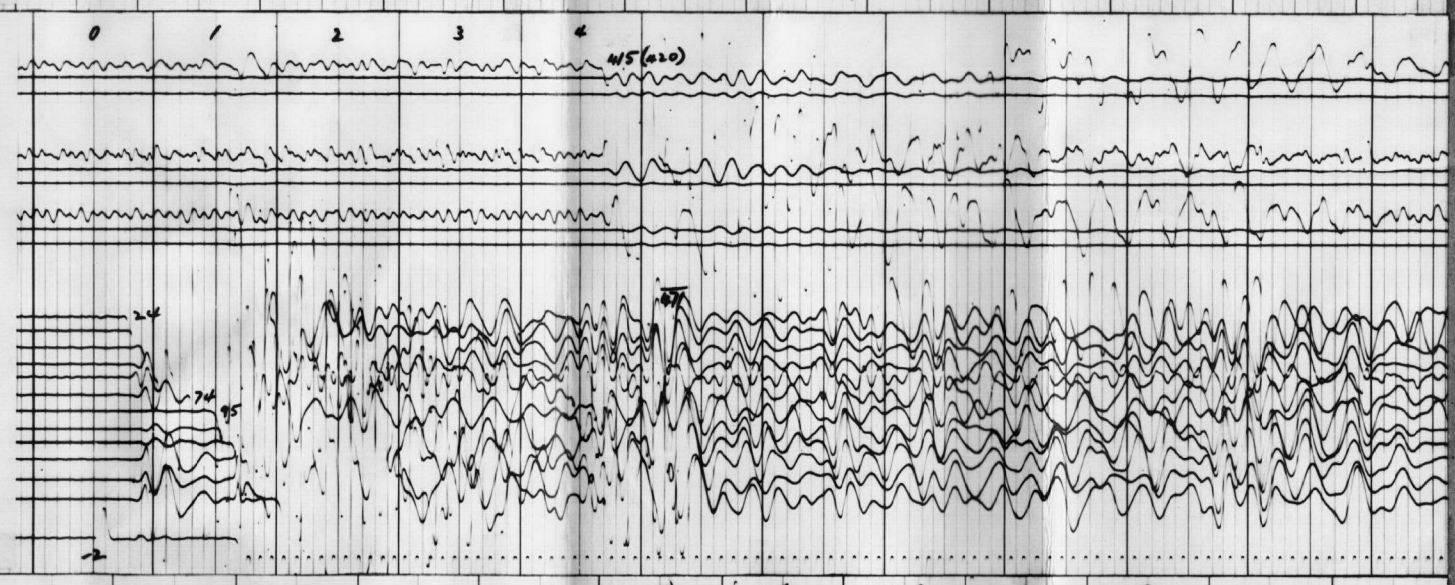
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 4180'
VERTICAL COMPONENT: No 1 - HIGH, No 2 - MEDIUM, No 3 - LOW
HORIZONTAL COMPONENT No 1: No 4 - HIGH, No 5 - MEDIUM, No 6 - LOW
HORIZONTAL COMPONENT No 2: No 7 - HIGH, No 8 - MEDIUM, No 9 - LOW
FILTER: L2H3 A.G.C.: C
SP: 2A **SP POSITION:** 1000' NORTH OF WELL
SHOT: 17C CHARGE: 10 DEPTH: 80/84
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP.: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

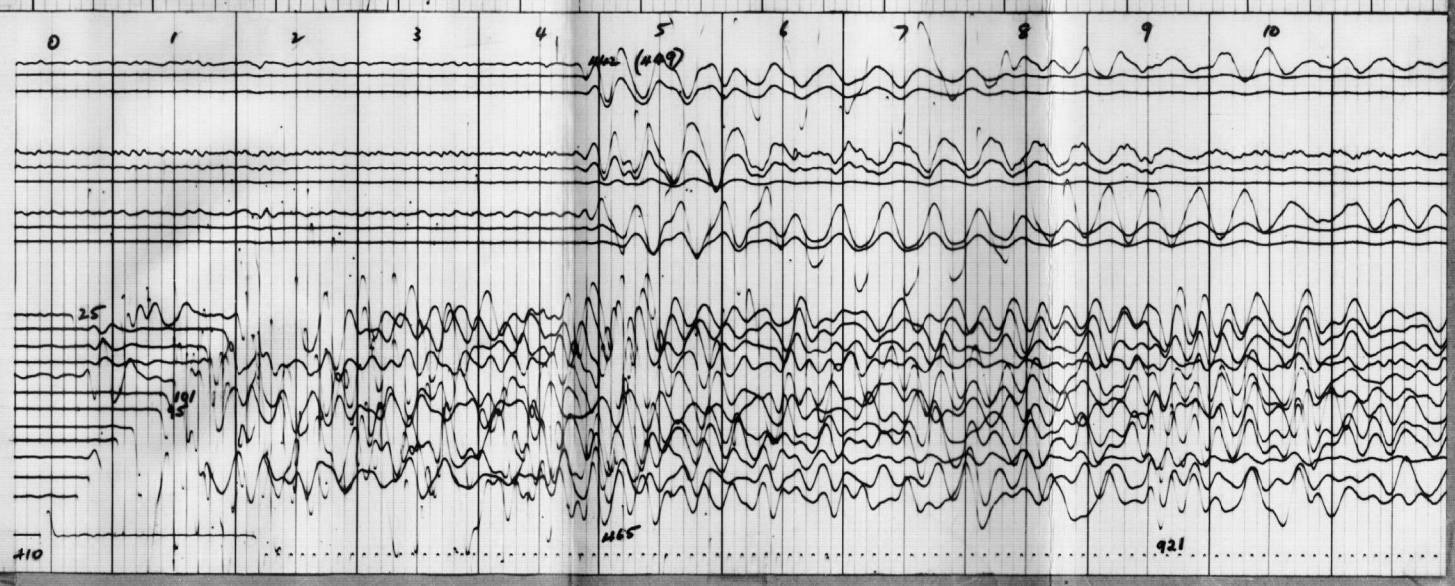
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 4180'
VERTICAL COMPONENT: No 1 - HIGH, No 2 - MEDIUM, No 3 - LOW
HORIZONTAL COMPONENT No 1: No 4 - HIGH, No 5 - MEDIUM, No 6 - LOW
HORIZONTAL COMPONENT No 2: No 7 - HIGH, No 8 - MEDIUM, No 9 - LOW
FILTER: L2H3 A.G.C.: C
SP: 3A **SP POSITION:** 600' SOUTH OF WELL
SHOT: 5E CHARGE: 10 DEPTH: 77/82
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP.: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

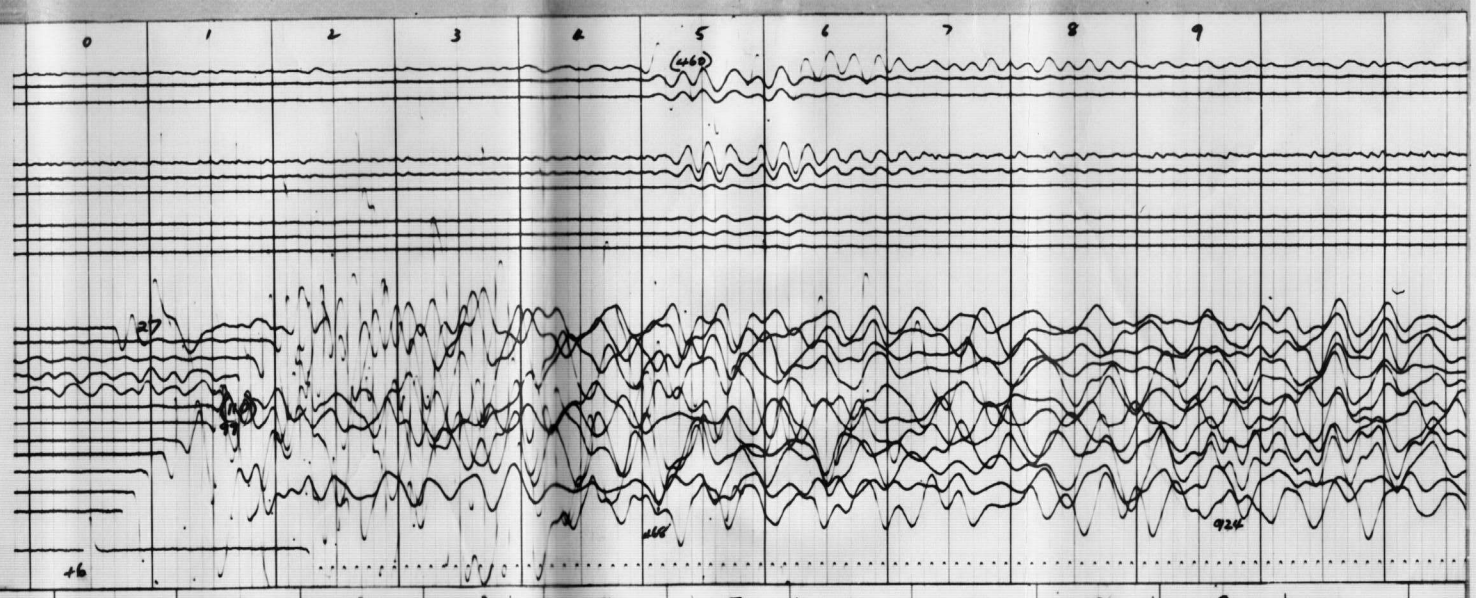
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 4490'
VERTICAL COMPONENT: No 1 - HIGH, No 2 - MEDIUM, No 3 - LOW
HORIZONTAL COMPONENT No 1: No 4 - HIGH, No 5 - MEDIUM, No 6 - LOW
HORIZONTAL COMPONENT No 2: No 7 - HIGH, No 8 - MEDIUM, No 9 - LOW
FILTER: L2H3 A.G.C.: C
SP: 1B **SP POSITION:** 600' NORTH OF WELL
SHOT: 15B CHARGE: 10 DEPTH: 77/81
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP.: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

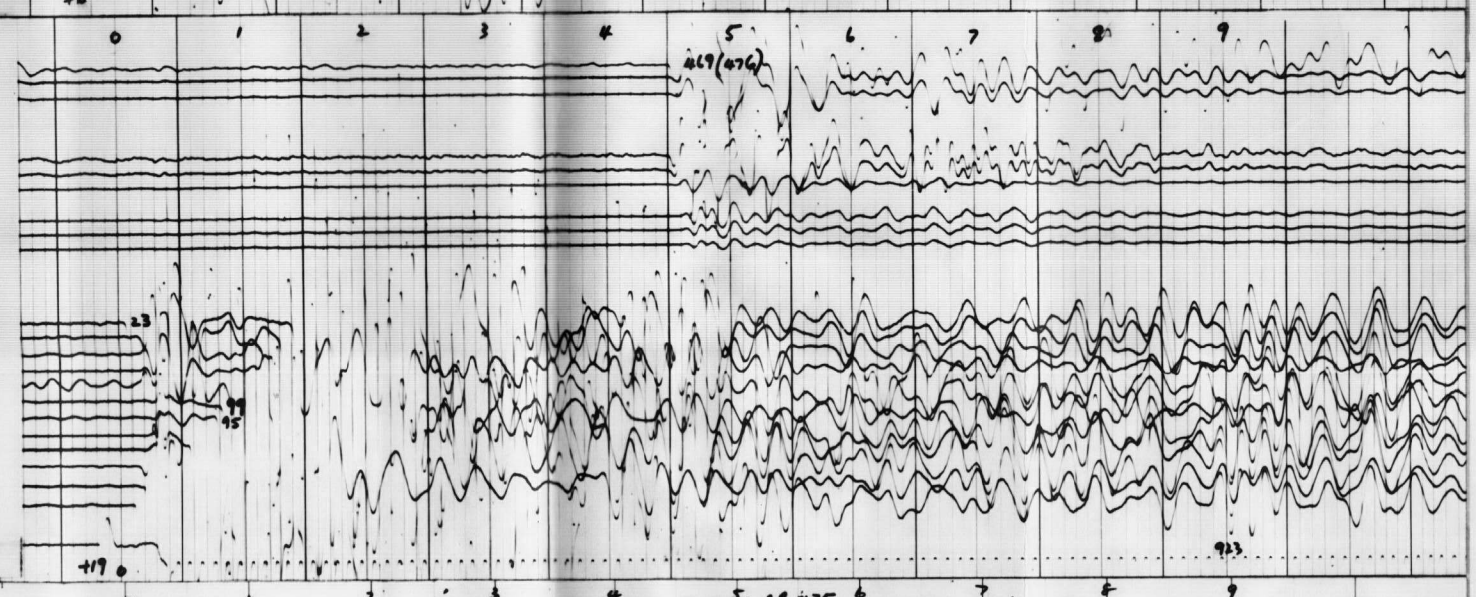
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 4650'
VERTICAL COMPONENT: No 1 - HIGH, No 2 - MEDIUM, No 3 - LOW
HORIZONTAL COMPONENT No 1: No 4 - HIGH, No 5 - MEDIUM, No 6 - LOW
HORIZONTAL COMPONENT No 2: No 7 - HIGH, No 8 - MEDIUM, No 9 - LOW
FILTER: L2H3 A.G.C.: C
SP: 1B **SP POSITION:** 600' NORTH OF WELL
SHOT: 14A CHARGE: 20 DEPTH: 76/84
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP.: 20%
REMARKS: CHARGE STANDING IN HOLE FOR OVER A WEEK. DID NOT COMPLETELY EXPLODE ?



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

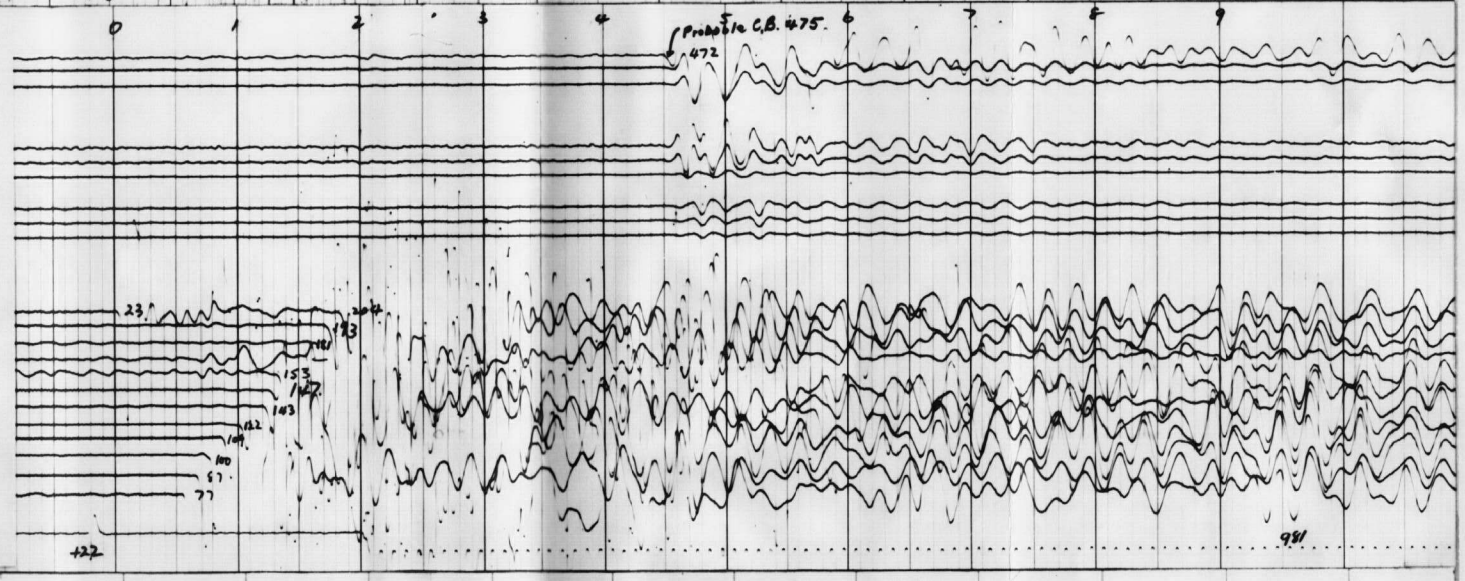
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 4835'
VERTICAL COMPONENT: No 1 - HIGH, No 2 - MEDIUM, No 3 - LOW
HORIZONTAL COMPONENT No 1: No 4 - HIGH, No 5 - MEDIUM, No 6 - LOW
HORIZONTAL COMPONENT No 2: No 7 - HIGH, No 8 - MEDIUM, No 9 - LOW
FILTER: L2H3 A.G.C.: C
SP: 1A **SP POSITION:** 600' NORTH OF WELL
SHOT: 12D CHARGE: 25 DEPTH: 69/79
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP.: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

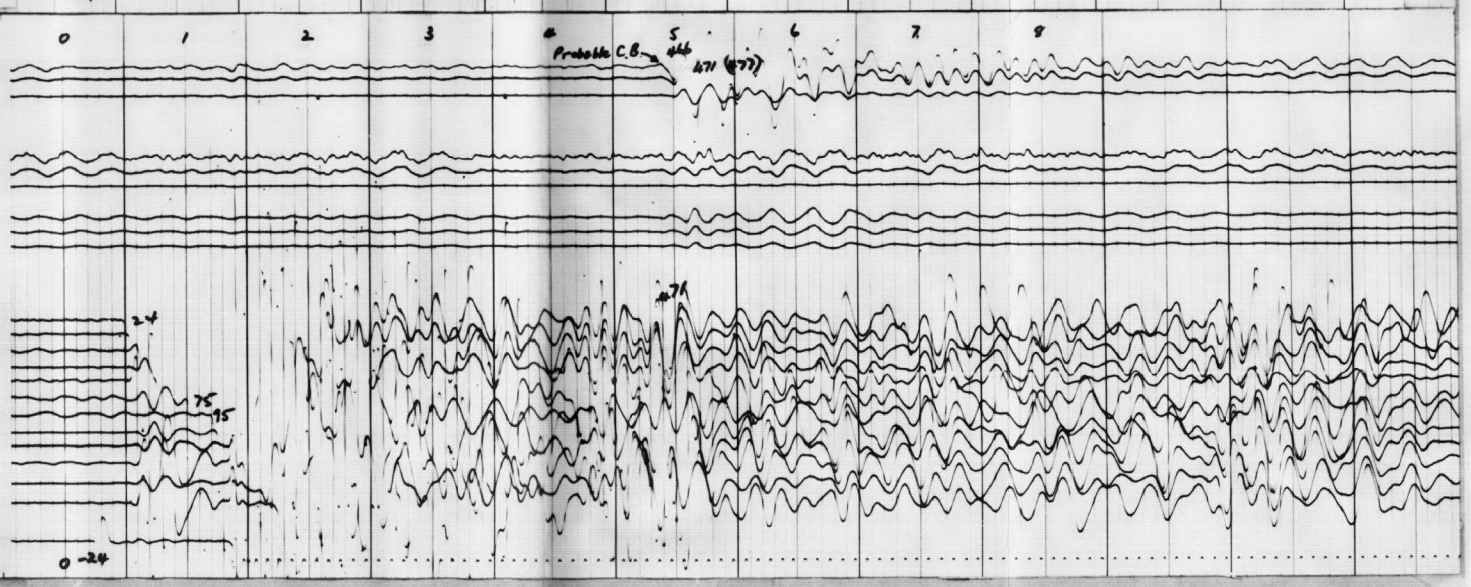
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 4835'
VERTICAL COMPONENT: No 1 - HIGH, No 2 - MEDIUM, No 3 - LOW
HORIZONTAL COMPONENT No 1: No 4 - HIGH, No 5 - MEDIUM, No 6 - LOW
HORIZONTAL COMPONENT No 2: No 7 - HIGH, No 8 - MEDIUM, No 9 - LOW
FILTER: L2H3 A.G.C.: C
SP: 2A **SP POSITION:** 1000' NORTH OF WELL
SHOT: 13B CHARGE: 10 DEPTH: 80/84
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP.: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

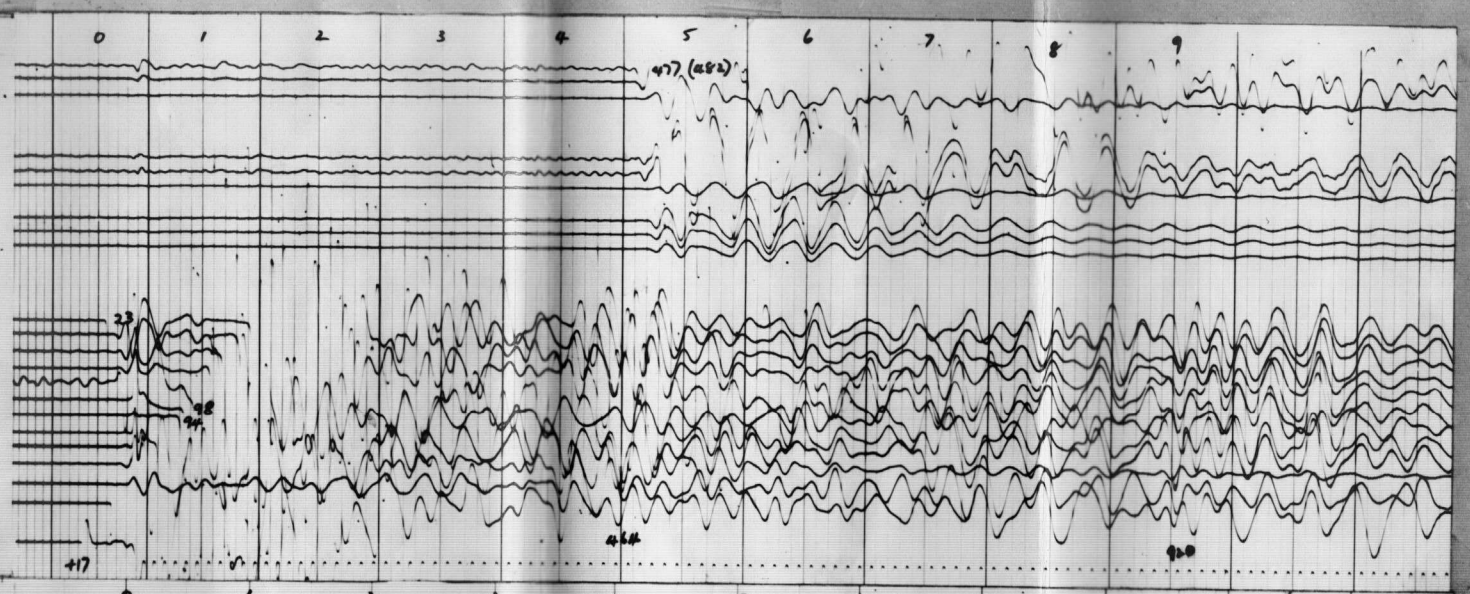
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 4835'
VERTICAL COMPONENT: No 1 - HIGH, No 2 - MEDIUM, No 3 - LOW
HORIZONTAL COMPONENT No 1: No 4 - HIGH, No 5 - MEDIUM, No 6 - LOW
HORIZONTAL COMPONENT No 2: No 7 - HIGH, No 8 - MEDIUM, No 9 - LOW
FILTER: L2H3 A.G.C.: C
SP: 3A **SP POSITION:** 600' SOUTH OF WELL
SHOT: 6F CHARGE: 10 DEPTH: 77/81
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP.: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

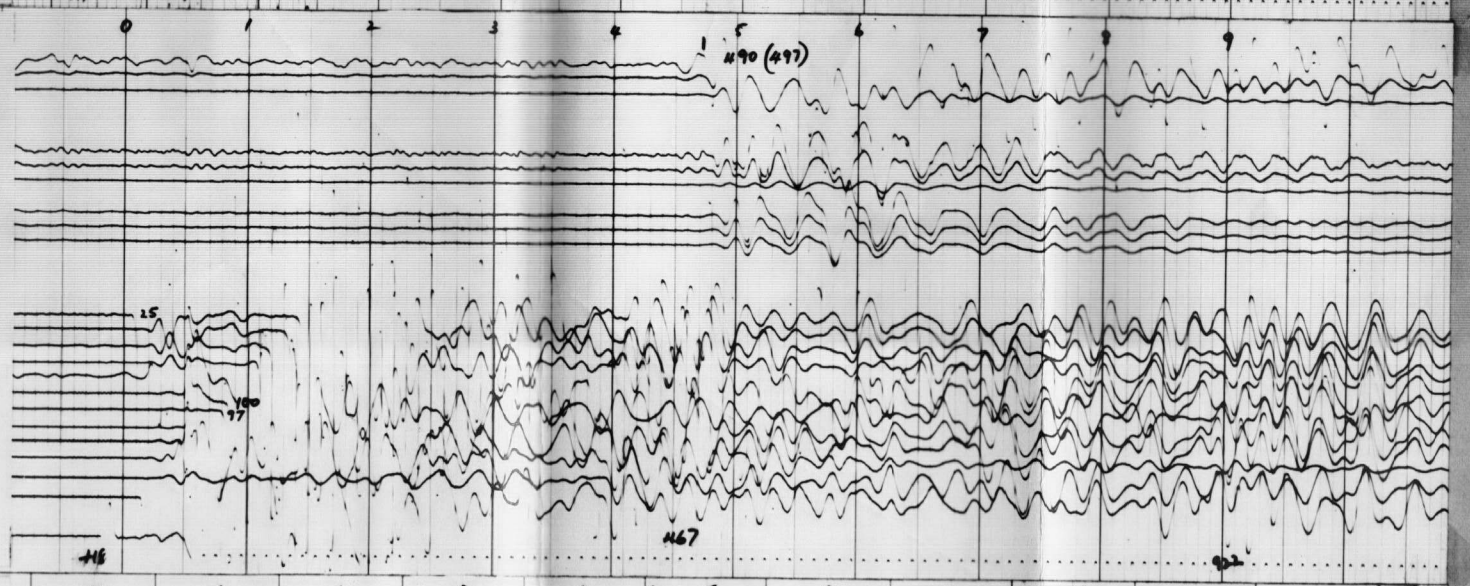
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 5000'
VERTICAL COMPONENT: No 1 - HIGH, No 2 - MEDIUM, No 3 - LOW
HORIZONTAL COMPONENT No 1: No 4 - HIGH, No 5 - MEDIUM, No 6 - LOW
HORIZONTAL COMPONENT No 2: No 7 - HIGH, No 8 - MEDIUM, No 9 - LOW
FILTER: L2H3 A.G.C.: C
SP: 1A **SP POSITION:** 600' NORTH OF WELL
SHOT: 9B CHARGE: 20 DEPTH: 75/83
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

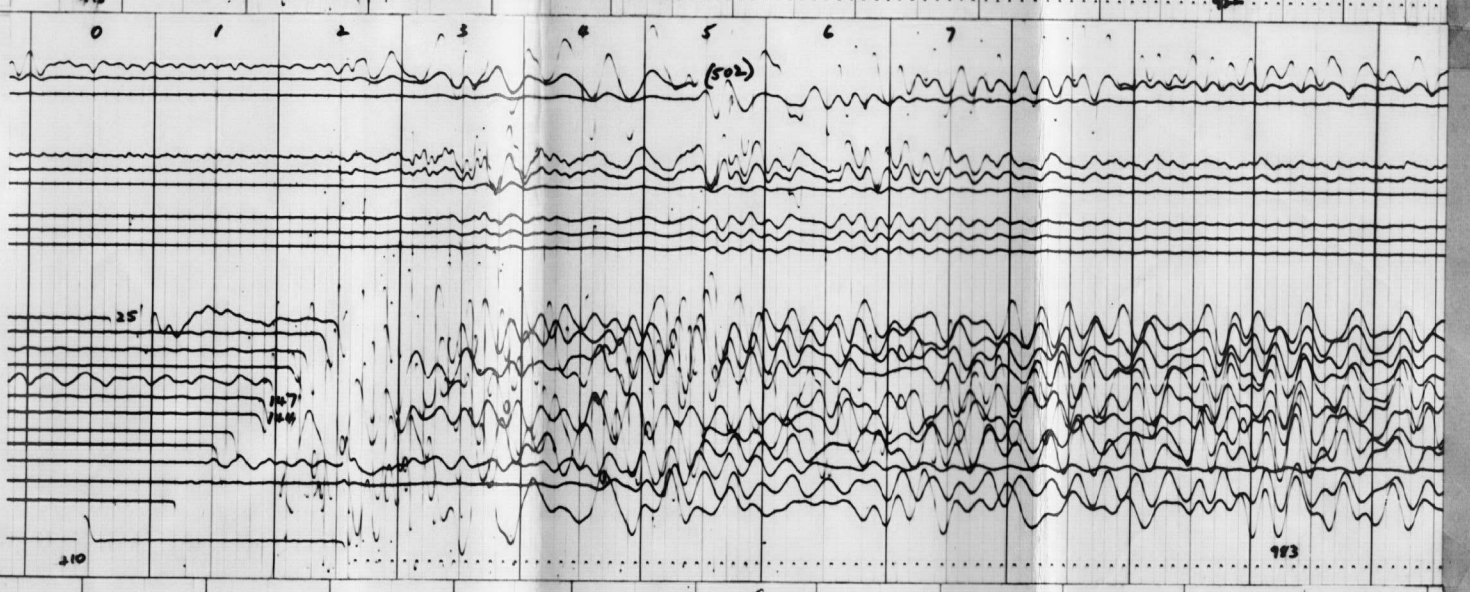
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 5218'
VERTICAL COMPONENT: No 1 - HIGH, No 2 - MEDIUM, No 3 - LOW
HORIZONTAL COMPONENT No 1: No 4 - HIGH, No 5 - MEDIUM, No 6 - LOW
HORIZONTAL COMPONENT No 2: No 7 - HIGH, No 8 - MEDIUM, No 9 - LOW
FILTER: L2H3 A.G.C.: C
SP: 1A **SP POSITION:** 600' NORTH OF WELL
SHOT: 10C CHARGE: 20 DEPTH: 72/80
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C • PRESUPP: 20%
REMARKS:



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

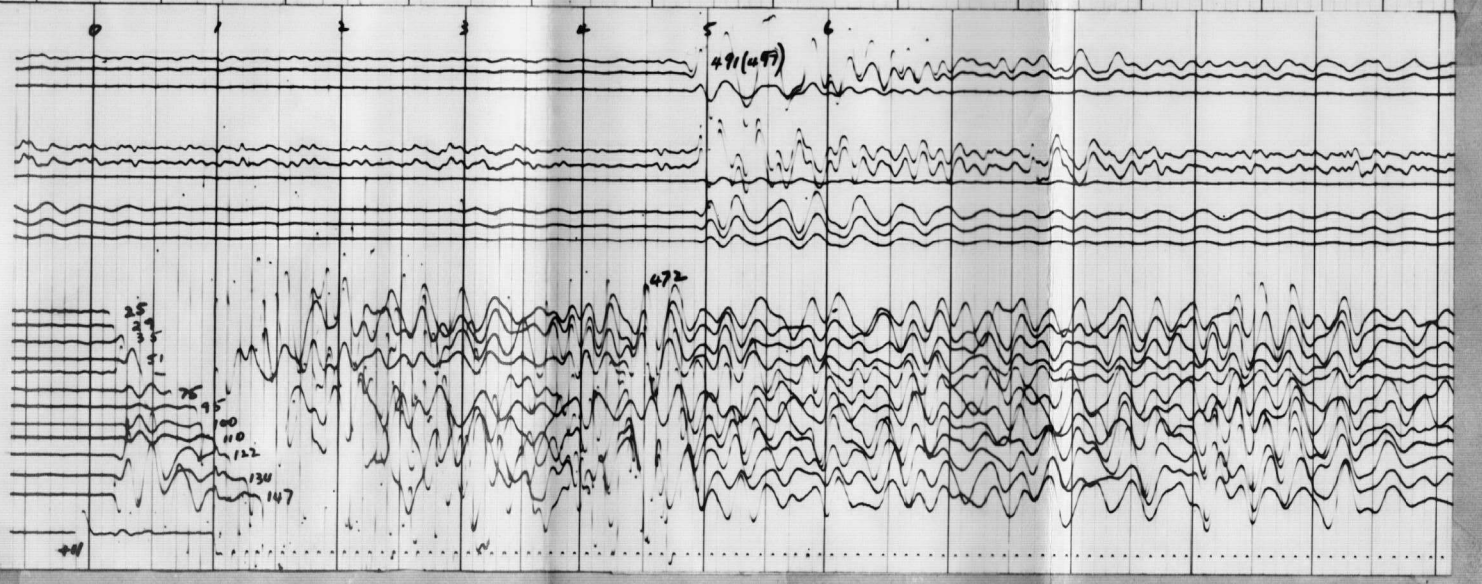
WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 5218'
VERTICAL COMPONENT: No 1 - HIGH, No 2 - MEDIUM, No 3 - LOW
HORIZONTAL COMPONENT No 1: No 4 - HIGH, No 5 - MEDIUM, No 6 - LOW
HORIZONTAL COMPONENT No 2: No 7 - HIGH, No 8 - MEDIUM, No 9 - LOW
FILTER: L2H3 A.G.C.: C
SP: 2A **SP POSITION:** 1000' NORTH OF WELL
SHOT: 11A CHARGE: 20 DEPTH: 76/84
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP: 20%
REMARKS: HOSE BEING PLAYED ON CABLE



BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT **DEPTH:** 5218'
VERTICAL COMPONENT: No 1 - HIGH, No 2 - MEDIUM, No 3 - LOW
HORIZONTAL COMPONENT No 1: No 4 - HIGH, No 5 - MEDIUM, No 6 - LOW
HORIZONTAL COMPONENT No 2: No 7 - HIGH, No 8 - MEDIUM, No 9 - LOW
FILTER: L2H3 A.G.C.: C
SP: 3B **SP POSITION:** 600' SOUTH OF WELL
SHOT: 7A CHARGE: 20 DEPTH: 74/82
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 6×20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP: 20%
REMARKS:

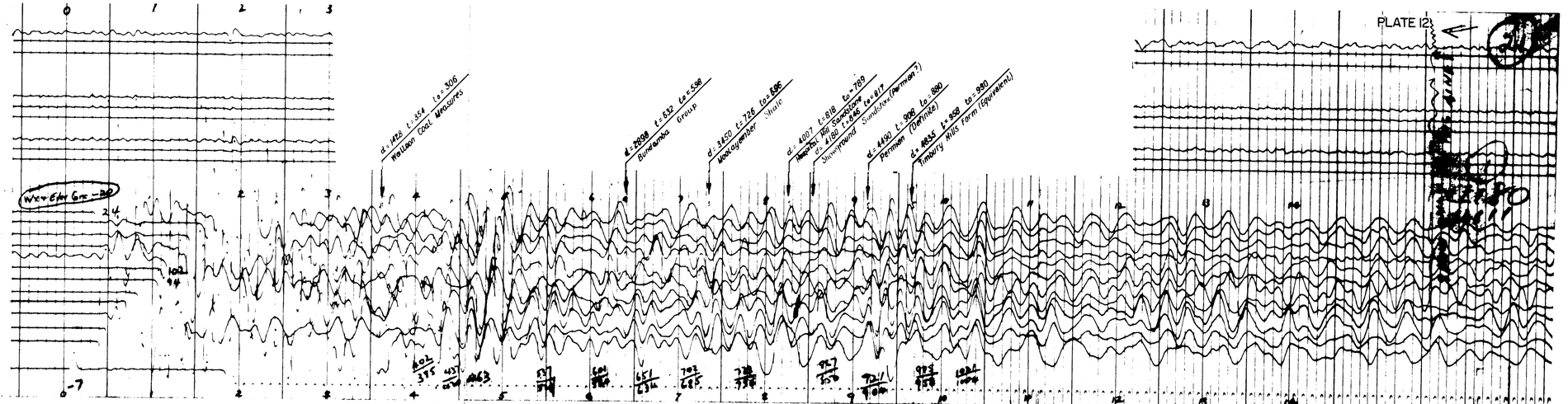


BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

WELL VELOCITY SURVEY

WELL: A.A.O PICKANJINNIE No 1 DATE: 12·7·60
WELL GEOPHONE: T.I.C. 3 COMPONENT DEPTH: 4180'
VERTICAL COMPONENT: No 1-HIGH, No 2-MEDIUM, No 3-LOW
HORIZONTAL COMPONENT No 1: No 4-HIGH, No 5-MEDIUM, No 6-LOW
HORIZONTAL COMPONENT No 2: No 7-HIGH, No 8-MEDIUM, No 9-LOW
FILTER: L2H3 A.G.C.: C
SP: 1B SP POSITION: 600' NORTH OF WELL
SHOT: 16C CHARGE: 15 DEPTH: 80/86
SPREAD: No 10 AT SP 3, No 16 AT WELL, No 21 100' SOUTH OF SP 1
GEOPHONES: T.I.C. 5-20 CYC. AMPLIFIER: T.I.C. 621 CAMERA: T.I.C. 10"
FILTER: L2H4 GAINS: MAX. A.G.C.: C PRESUPP: 20%
REMARKS:

PLATE 12



LEGEND
d = depth of formation in bore
t = uncorrected reflection time on record (1200 ft. from shot point)
to = reflection time corrected to datum (1000 ft. a.s.l.)
to = t - (weathering and elevation correction) - (spread correction)

POSITION OF STRATIGRAPHIC BOUNDARIES
IN RELATION TO REFLECTIONS

GEOPHYSICAL BRANCH, BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS G38-98
To Accompany Record No 1962/52