

FINAL REPORT  
E.L.2200

Otter Exploration N.L.

C.J.Kojan, '81

NORTHERN TERRITORY  
GEOLOGICAL SURVEY

OPEN FILE

8 Petrography Slides housed  
at N.T.G.S. Yellowknife, N.T.

6/1861

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1979 EXPLORATION PROGRAM

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NORTHERN TERRITORY  
GEOLOGICAL SURVEY

EL 2200

INTRODUCTION

Exploration Licence 2200 was granted on January 17, 1980. The Licence is located in the East Rodinga Ranges area, on the southeast margin of the Camel Flat Syncline. The Syncline is located within the Upper Proterozoic - Palaeozoic Amadeus Basin, which is situated south of Alice Springs.

The Silurian-Carboniferous sandstones and siltstones, which outcrop on the Syncline's margin, were considered to have potential for roll-front uranium mineralisation. E.L. 2200 and the adjoining El 1702 occupy prospective sand covered areas in the eastern part of the Syncline.

Two surveys for radon gas, using the 'Track Etch' technique, were undertaken in 1979 with the object of locating subsurface uranium mineralisation beneath the sandcover. The best anomalies were obtained in E.L. 2200. A total of 6 percussion holes were drilled in May, 1980 with the object of testing these anomalies. An additional 3 holes were drilled on open ground to the west of the Licence.

No evidence of uranium mineralisation was obtained and the Licence was allowed to expire in January, 1981.

LOCATION (Ref. Fig. 1)

The Licence is located approximately 200km. by road, southeast of Alice Springs. The Licence is located on Allambi and Todd River stations.. Best access from Alice Springs is via Santa Teresa Mission and Allambi homestead.

GEOLOGY (Ref. Fig. 3)

The radon gas anomalies are situated within an area of gypsum deposits, occupying the southern part of the Camel Flat Syncline. These deposits are in part covered by up to 6 metres of wind-blown sand. Drilling indicates that the gypsum is underlain by calcrete. These deposits extend to a depth of approximately 14 metres. At this depth a thin clay horizon was intersected which most probably represents a regolith developed on bedrock. The bedrock consists of a monotonous section of pink and grey sandstone and shales.

In five holes, namely GB - 3, 4, 7, 8 and 9, the drill passed through the clay horizon into a loosely consolidated and poorly sorted deposit of yellow sand and gravel. This deposit produced a very high water flow which resulted in four holes being abandoned (GB 3, 4, 7 and 8) without penetrating bedrock. The deposit is thought to represent a Tertiary river channel.

The radon gas anomalies show a spatial relationship to this aquifer and most probably relate to radon contained in underground water, rather than a specific uranium source.

#### WORK COMPLETED AND RESULTS

6 rotary percussion drill holes,(GB 1, 3, 4, 5, 7 and 8)were drilled within the Licence area. 3 holes were drilled a short distance outside the western boundary of the licence. Average depth drilled was 37 m. The holes were logged using an SIE T450 gamma logging unit, and a chart was obtained for each hole (Refer Appendix). The data was used as a basis for sample selection for uranium analysis. Geology logs were prepared for each hole, based on field examination of each 2m. increment of drill cuttings. Water samples were taken for uranium analysis from all drillholes. 7 samples were submitted for petrography (refer Appendix).

No significant uranium results were obtained from the drill cuttings. The best result, 80ppm uranium, was obtained from a depth of 6 - 10 m in GB-9. The intersection is within the gypsum beds near the transition to the underlying calcrete. Bore water samples gave values ranging from less than 2 ppb - 53 ppb uranium.

CONCLUSIONS AND RECOMMENDATIONS

The strongest radon gas anomalies have been drill tested with discouraging results. No significant uranium values were obtained in either drill cuttings or bore water.

The distribution of the radon gas anomalies appears to be spatially related to a sinuous deposit of yellow sand and gravel which yields very high water flows. This deposit is located beneath a clay regolith and overlain by evaporitic deposits of calcrete, gypsum and granite.

No further work is recommended in the Licence area and the Licence has been allowed to expire.

EXPENDITURE DETAILS. EL. 2200. 1980-81

Salaries and Wages	\$2093
Field Travel	416
Field Supplies	325
Maps and Drafting	200
Licence Fees	117
Assays	515
Equipment Hire	2074
Drilling Contractor	<u>8000</u>
	13740
Head Office	<u>2500</u>
Total	<u>\$16240</u>

APPENDICES

GAMMA LOGS (CHARTS) AND GEOLOGY LOGS.

PERCUSSION HOLES 1 - 9 INCLUSIVE

## CYSPUM BORE-PROSPECT

1 of 2

HOLE NO : GB1

DEPTH.

50m.

GRID CO. ODDS. 00N.

200 W

STARTED 14/5/80

FINISHED 14/5/80.

GAMMA LOG DEPTH = 37.5m.

DRILLING CO. + HICKY DRILLERS.

LOGGED BY CP

SAMPLE NO	DEPTH. metres	SANDY INTERVAL	ROCK	LITHOLOGY	CONTENTS
29001	0.0 - 2.0	2m	br	ss50, gy40, cc10.	sand
	2 - 2.0 - 4.0	2m	pbbr	gy60, cl70	
3.	4 - 6	2m	pbbr	ss50, gy30	
4	6 - 8	2m	bg	ss50, gy30, cl90.	
5	8 - 10	2m	bg	cc80, gy20.	
6	10 - 12	2m	wh	gy60, cc40.	
	12 - 14	2m	rnbr	cc60, gy40	
8	14 - 16	2m	br	cl80, gy20.	
9	16 - 18	2m	br	cl80, gy10.	
29010	18 - 20	2m	rdbr	cl40, ss40, gy20.	ss50
1	20 - 22	2m	rdbr	ss70, sh10 & gy	shales
2	22 - 24	2m	gypk	ss90, sh10 & gy.	
3	24 - 26	2m	pkgy	ss60, sh10.	
4	26 - 28	2m	gypk	ss80, sh20	
5	28 - 30	2m	gypk	ss90, sh10	
6	30 - 32	2m	pkpk	ss90, sh10	
7*	32 - 34	2m	pkgy	ss60, sh10	
8	34 - 36	2m	pk	ss80, sh20	
9	36 - 38	2m	gybr	ss90, sh10	
29020	38 - 40	2m	gypk	ss70, sh30	

2f2

GB1 cont.

SAMPLE NO.	DEPTH (meters)	SAMPLE NUMBER	TYPE	LITHOLOGY	CONTINUATION
2902.1	40-42	2m	pkbr	ss100.	55h
2	42-44	2m	br.	ss90, sh10	ashin.
3	44-46	2m	gypk.	ss90, sh10, gyp.	↓
4	46-48	2m	pkbr	ss100 dash	↓
2902.5	48-50	2m	pkbr	ss100 dash	↓

END AT 50.0m

ss is fine grained unsorted dolomitic.

GPACK

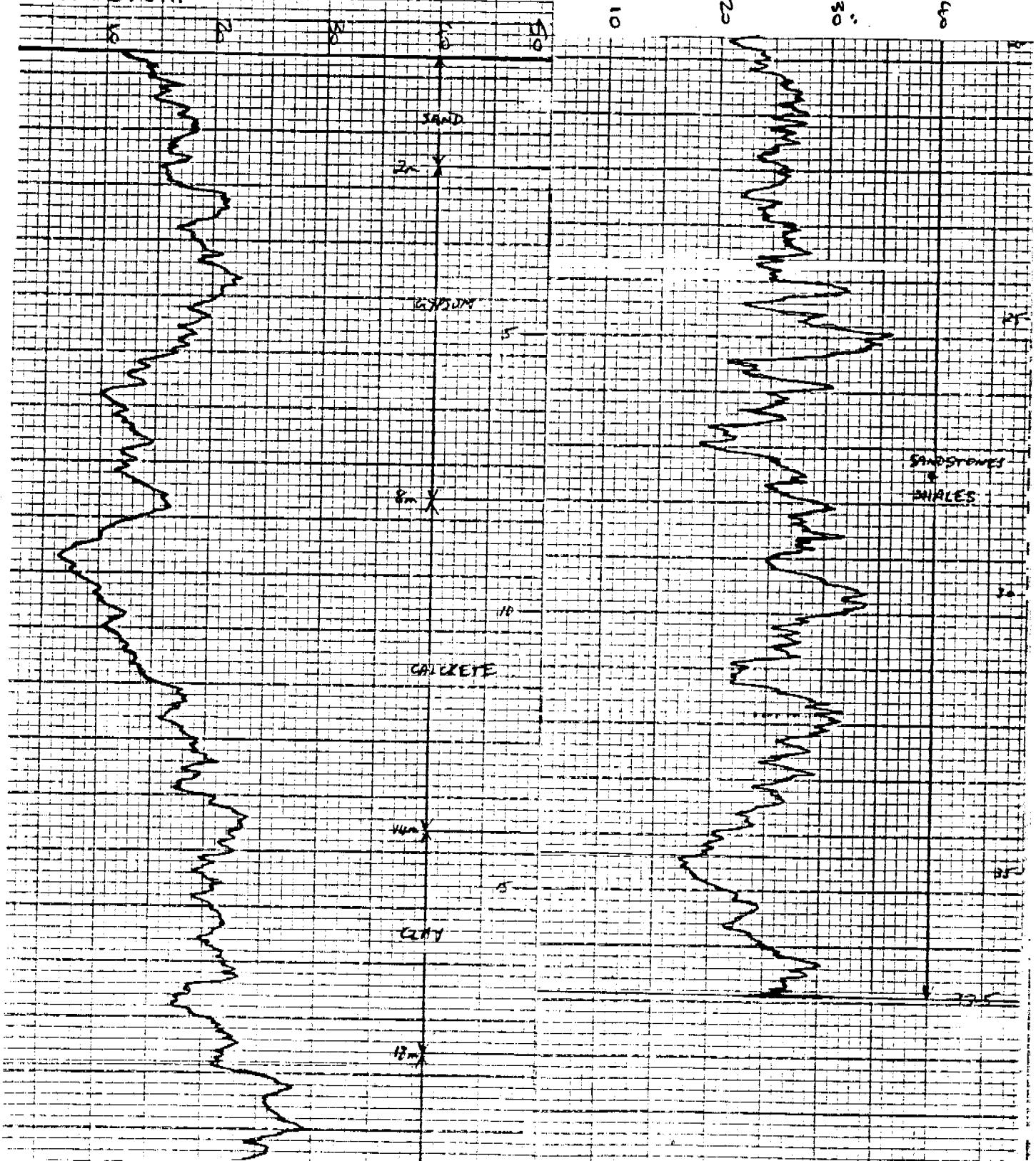
GBJ

16/5/80

50 CPS

2 TC

DEPTH 3715 m



142.

Hole No : GB 2.

DEPTH 50 m

G'DN CO-OPERS. Core 400mW

STARTED 14/5/80 FINISHED 14/5/80

C. APPROX. LENGTH DEPTH = 31.4 m.

1' THICKNESS CO. THICKNESS DRILL HIPS.

LITHOLOGY: GP.

Sample No	DEPTH meters	Sample number	Section depth m	LITHOLOGY	Comments
27026	0 - 2	2m	bg	gg90, sandee	
7	2 - 4	2m	pabrg	gg60, s60	77
8	4 - 6	2m	pabg	gg50, s40	
9	6 - 8	2m	wh	s60, cc80, gg90	
27020	8 - 10	2m	pbbr	ss0, gg40, cl10	sand
1	10 - 12	2m	wh	gy40, cc80, s20	
2	12 - 14	2m	whbr	cc60, gy60	calcareous
3	14 - 16	2m	br	cl80, gy20	
4	16 - 18	2m	br	cl60, gg10	clay
5	18 - 20	2m	br	cl50, ss30	
6	20 - 22	2m	pkbr	ss80, sh20	
7	22 - 24	2m	pkbr	ss50, sh30	WET S.S.
8	24 - 26	2m	pkbr	ss80, sh10	S.S.
9	26 - 28	2m	pkbr	ss70, sh30	shg
27010	28 - 30	2m	pkbr	ss90, sh10	
1	30 - 32	2m	pkbr	ss90, sh10	
2	32 - 34	2m	pkbr	ss90, sh10	
3	34 - 36	2m	pkbr	ss90, sh10	
4	36 - 38	2m	pkbr	ss80, sh20, gy	
27015	38 - 40	2m	pkbr	ss100, sh100, sh	

## GB2 cont.

Sample no.	DEPTH (metres)	Coring INTERVAL	Core No.	LITHOLOGY	COMMENTS
2304.1	40 - 42	2m	pkbr	ss100 tsh.	1
7	47 - 49	2m	pkbr	ss100 tsh.	SS's
8	44 - 46	2m	pkbr	ss90, sh10	+ sh's
7	46 - 48	2m	pkbr	ss90, sh10	
2305D	48 - 50	2m	pkbr	ss80, sh20	

EON AT 50.0 m.

ss = fine grained, unsorted dolomite

GB-2 Clik May 16 '60

chart speed 100

CPS 50

TC 12

depth 31.4 max ~30cps

6

2

W

E

S

GND.

GND

SAND

10m

10

CALCITE

60'

10

20

30

40

SANDST.

SNAILS

20

GB-2 31.4 m

7-1

HOLE No. GB3

DEPTH 20 m

GRID no. 2005 200W.

STARTED 15/5/80 FINISHED 15/5/80.

GEOGRAPHIC LOG DEPTH = 15.0 m.

DRILLING CO: HICKORY DRILLERS.

FLAGGED BY: GP.

Sample No.	DEPTH	sample interval	lithology	Comments
29051	0 - 2	2m	lb. sgg, silc 10.	SAND
	2 - 4	2m	lb. sgg, ccs, silc 20.	
3	4 - 6	2m	br. clayey s, 70, ccs, silc 10.	
4	6 - 8	2m	wh. ccs, gy 10, clayey sil 10.	
5	8 - 10	2m	wh. cc 100, tg gy.	
6	10 - 12	2m	wh. gg 100.	CALCAREOUS
7	12 - 14	2m	wh. cc 100.	
F	14 - 16	2m	pinkish, sgg, ccs 10.	CLAY
9	16 - 18	2m	y w. silo.	RIVER SAND
29060	18 - 20	2m	y w. silo.	

END at 20m in sand.  
NO SIMPLE RETURNRIVER SAND is 80% modal. sub rounded to rounded  
gtz grains.

CHART No. SIE B054A

HOLE GB3

MAY 16 1980

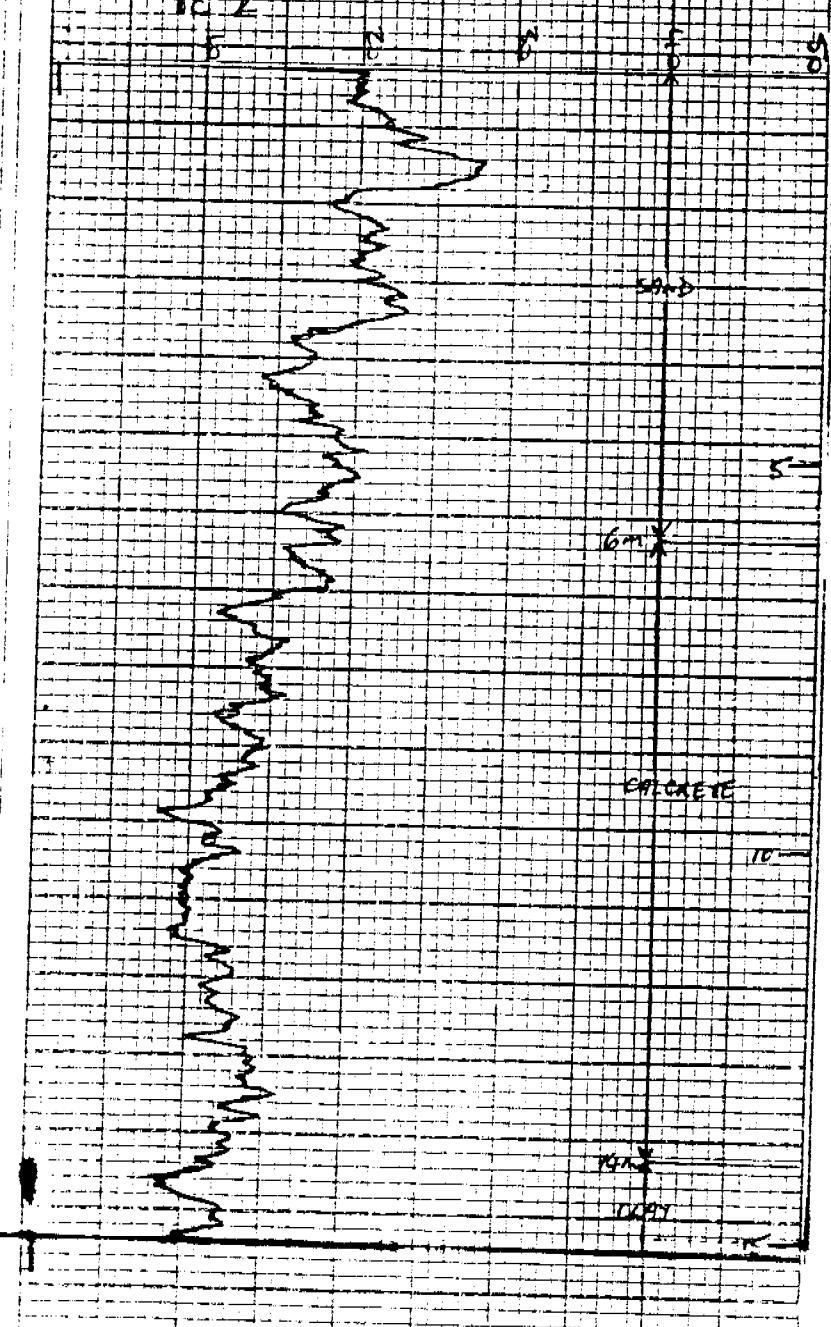
CTK

DEPTH 15M

CPS 50

TC 2

CHART SPEED 1000



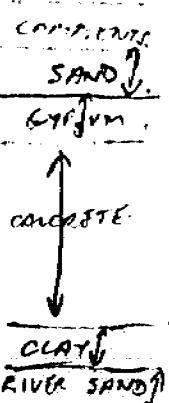
HOLE NO: GB4  
 GRID COORDS: 600S 00E  
 STARTED: 15/5/80 FINISHED: 15/5/80  
 GAMMA LOG DEPTH = 16.5m.  
 DRILLING TO HICKEY DRILLERS.  
 LOGGED BY: G.P.

INTERVAL No	DEPTH	SOURCE IN MM	LITHOLOGY
29061	0 - 2	2m lbr	570, Gy 30.
	2	2m lbr	Gy 80, s 20.
3	v - c	2m wh	cc 100, Gy 20.
4	6 - f	2m wh	cc 100
5	f - 10	2m wh	cc 90, Gy 10.
6	10 - 12	2m wh	cc 100 to Gy.
7	12 - v	2m lbr.	clay, silt, cc 10
29068	IV - 16	2m cr	570, cc 10

END AT 16m of WT.

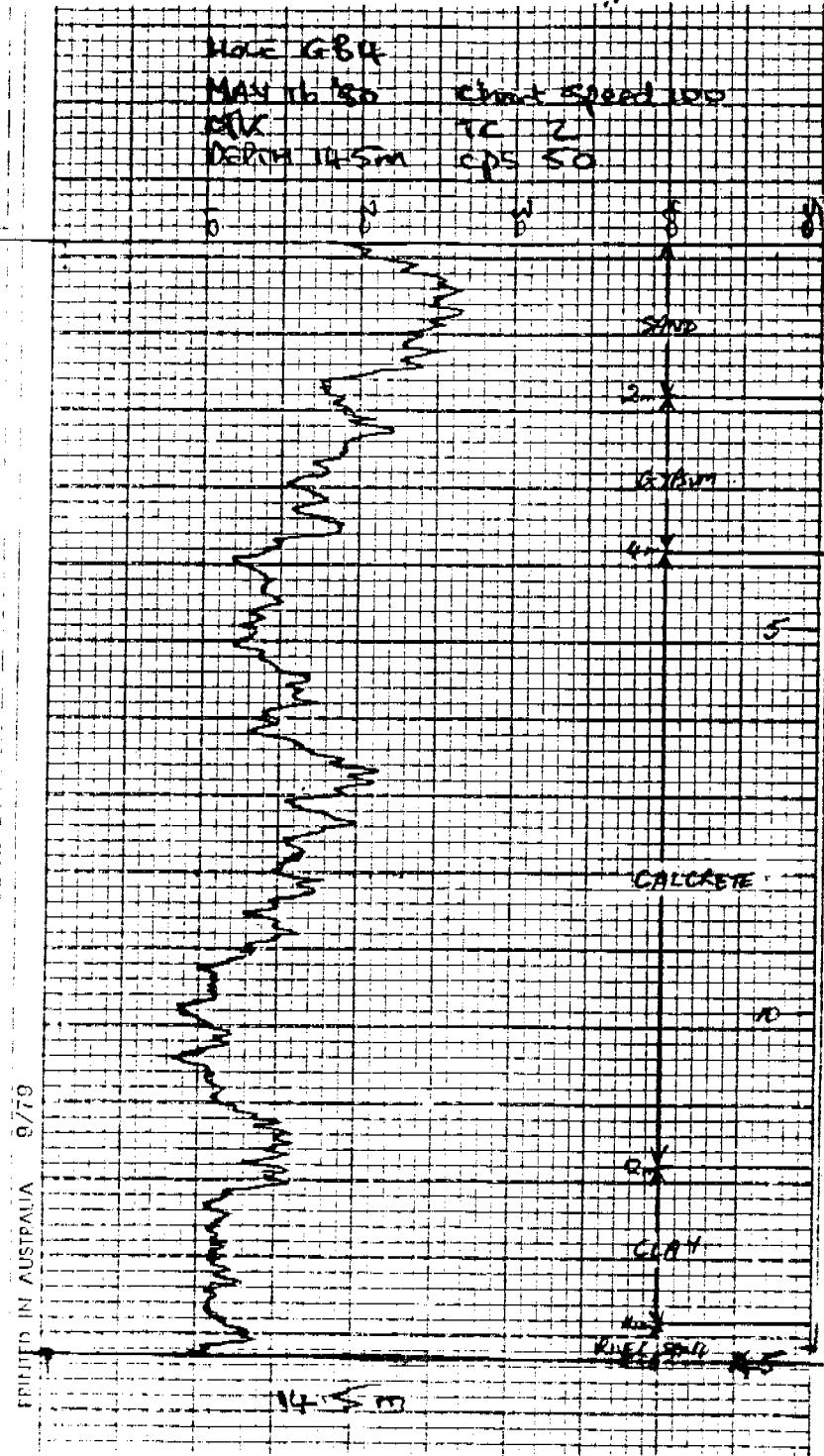
\* SAMPLE 29068 sand grain size well rounded & UNIMINERAL DIGEST.

1 of 1



CC = calcareous.  
 S = sand.  
 S/S = sandstone.  
 Gy = gypsum.  
 Silc = silcrete.  
 Cl = clay.  
 Sh = shale.

l = light.  
 po = pale.  
 br = brown.  
 wh = white.  
 cr = cream.  
 pt = pink.  
 gr = gray.  
 bge = beige.  
 gy = grey.  
 kk = kaki.  
 Ta = tan.  
 bu = buff.  
 rd = red.  
 olgr = olive green.



HOLE NO. GRS

DEPTH 50m.

GRID COORDS 6005 200E

STARTED 15/5/20

FINISHED 15/5/20

GAMMA LOG DEPTH 16.5m

DRILLING CO. HKKT DRILLERS

LOGGED BY C.P.

DEPTH m	DEPTH m	STATION	LITHOLOGY	COMMENTS
27069	1 - 3	2m	pk gyro, ss20	
27070	3 - 4	2m	pk gyro, ss10	
1	4 - 6	2m	pk gyro, cc30	
2	6 - 8	2m	pk br cc70, gy70	
3	8 - 10	2m	yellow cc80, gy70	
4	10 - 11	2m	white cc80, gy70	
5	12 - 14	2m	white cc100	
6	14 - 16	2m	pk br cc50, clay50	
7	16 - 18	2m	br clay60 gy70, cc70	
8	18 - 20	2m	pk br ss50, sh50, tr gy	
9	20 - 21	2m	pk br ss100, tr cc	
27087	22 - 24	2m	pk br ss70, cc10	
1	24 - 26	2m	pk br ss80, sh10 ..	
2	26 - 28	2m	pk br ss90, sh10	
3	28 - 30	2m	pk br ss90, sh10	
4	30 - 32	2m	pk br ss70, sh50	
5	32 - 34	2m	pk br ss90, sh10	
6	34 - 36	2m	pk br ss90, sh10 ..	
7	36 - 38	2m	pk br ss90, sh10	
27088	38 - 41	2m	br ss70, sh10 to mica?	

1ef2

GAP

CALCAREOUS

CLAY

SANDSTONES

SILTS

GL 5 cont.

SAMPLE NO	DEPTH (METERS)	STATION	INTERVAL	% GRES	LITHOLOGY
29089	40 - 42	2m	br	ss 90, sh 10, terric?	
29090	42 - 44	2m	pkbc	ss 90, sh 10, terric?	
1	44 - 46	2m	pkbc	ss 90, sh 10, terric?	
2	46 - 48	2m	pkbc	ss 90, sh 10, terric?	
29093	48 - 50	2m	pkbc	ss 70, sh 30, terric?	

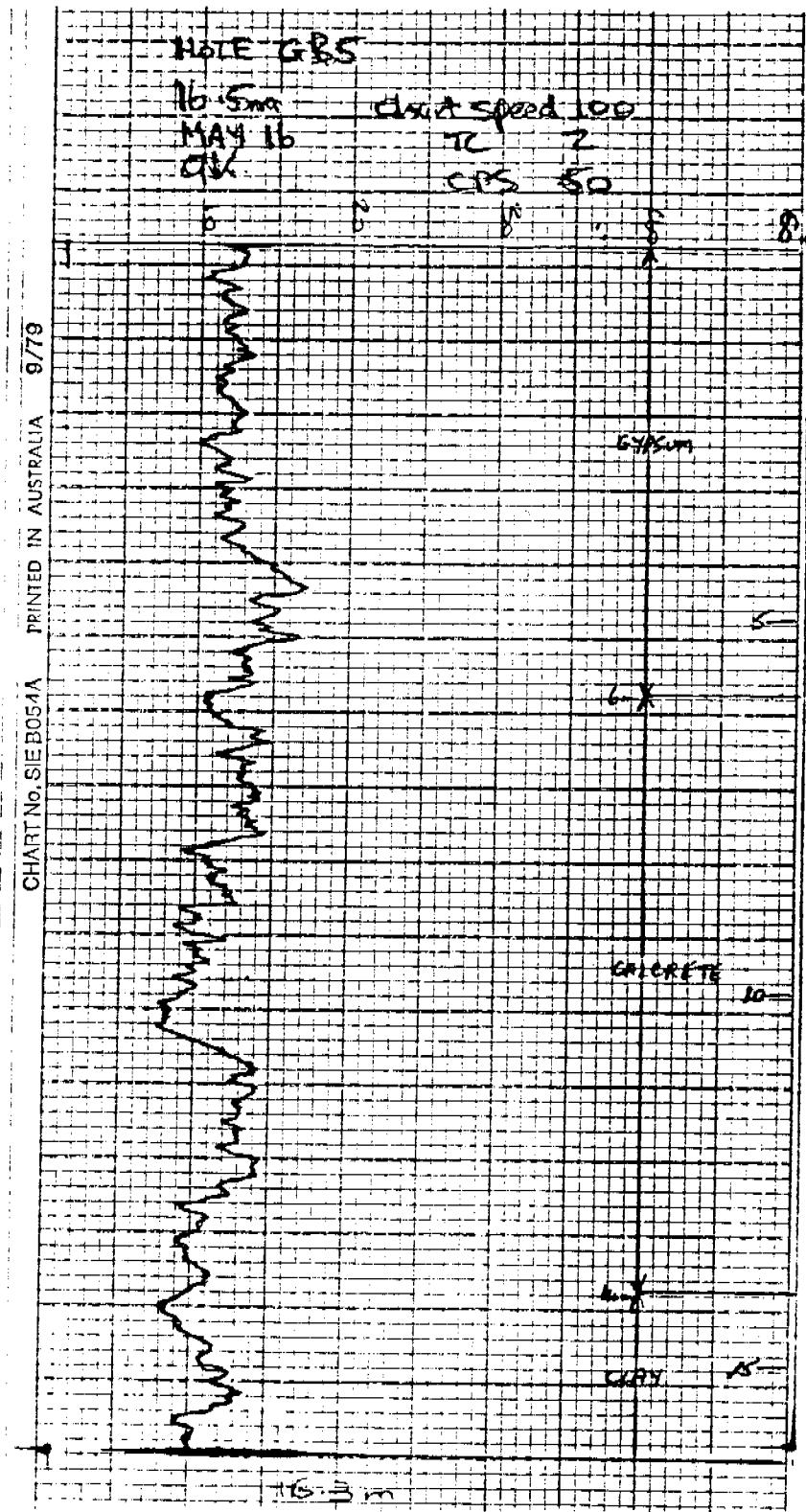
EON AT 50m = SS & Shales.

SS is fine grained.

2 of 2

COMPOSITIONS:

1  
SAND STONES  
" SHALE



1 of 2

HOLE NO. 66.

DEPTH 150m

GRID CO-ORDS 600N 00E

STARTED 15/5/80 FINISHED 16/5/80

MAXIMUM DEPTH = 18.0 meters

WELL CO. NICKEL DRILLERS.

16 GCD B.I. = GP.

STATION	DEPTH	COATINGS	LITHOLOGY	COMMENTS
29-76	0 - 2	2m	hr	sec, gy 20
5	2 - 4	2m	wh hr	gy 60, sec
6	4 - 6	2m	phhr	gy 50, sec
7*	6 - 8	2m	wh	gy 90, sec
8	8 - 10	2m	wh	gy 90, sec
29-77	10 - 12	2m	phhr	gy cl 60, gy 40
29-78	12 - 14	2m	phhr	ss 70, gy 10, chlo, shio.
1	14 - 16	2m	phhr	ss 90, shio, gy.
2	16 - 18	2m	phhr	ss 90, gy 10
3	18 - 20	2m	phhr	ss 100
4*	20 - 22	2m	phhr	ss 100
5	22 - 24	2m	phhr	ss 100
6	24 - 26	2m	phhr	ss 100
7	26 - 28	2m	phhr	ss 100
8	28 - 30	2m	phhr	ss 100
9	30 - 32	2m	phhr	ss 100
29-79	32 - 34	2m	phhr	ss 100
1	34 - 36	2m	phhr	ss 100
2	36 - 38	2m	phhr	ss 100
111.3	38 - 40	2m	phhr	ss 100

SAND

GYPSUM

CLAY

STAND STONE

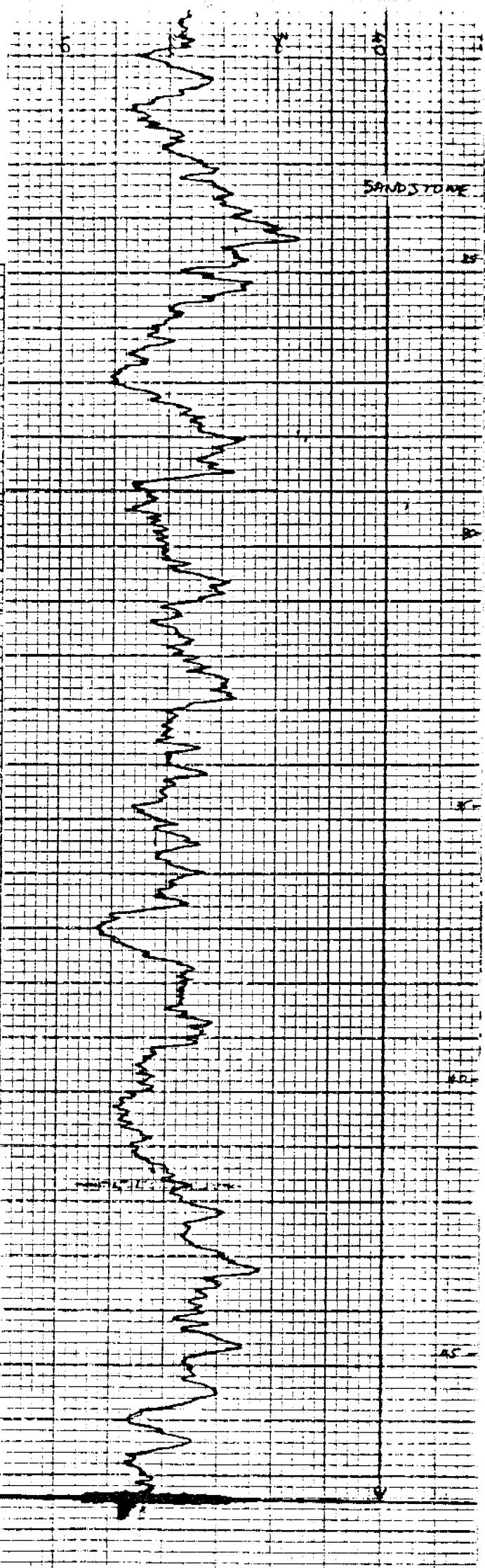
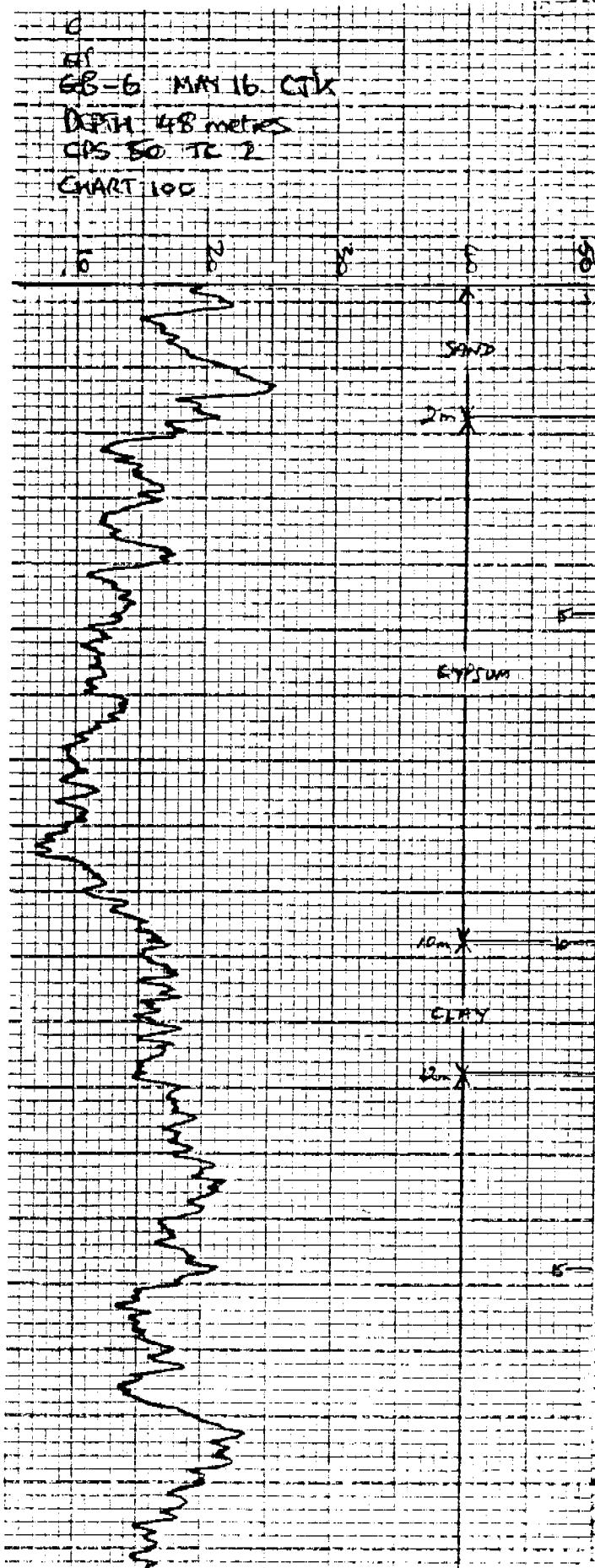
white  
angular  
fragments  
of  
harder s/s.  
possibly indurated  
with few s/s.

GB 6 cont.

2 of 2

SAMPLE NO.	DEPTH (METERS)	DEPTH IN CM	LITHOLOGY	COMMENTS
29116	40 - 42	2m	pkbr	ss100
5	42 - 44	2m	pkbr	ss100
6	44 - 46	2m	pkbr	ss100
7	46 - 48	2m	pkbr	ss100
29118	48 - 52	2m	pkbr	ss100

TOH AT 50cm ss  
55 infine granular



101.

HOLE NO. GB 7.

GRID COORDS: 000 N. 00 E

DEPTH: 28m

STARTED: 16/5/80.

FINISHED: 14/5/80.

GAMMA LOG DEPTH = 15.4 m

DRILLING CO: HICKET DRILLERS.

LITHOLOGY: GP

SAMPLE NO	DEPTH METRES.	STATION INTERVAL	LITHOLOGY	COMMENTS
27119	0 - 2	2m	lbry s50, cl40, gy10.	
27120	2 - 4	2m	lbry s70, gy20, cl10	SAND
1	4 - 6	2m	pbry s60, cl20, gy10.	
2	6 - 8	2m	brwhcc80, s30.	
3	8 - 10	2m	wh cc100.	CALCARE
4	10 - 12	2m	pbry cc80, gy10, cl10	
5	12 - 14	2m	pbry cc70, s30. trcl.	
6	14 - 16	2m	ybry s60, cc70.	
7	16 - 18	2m	yw s100	RIVER
8 *	18 - 20	2m	yw s100.	SAND
9	20 - 22	2m	yw s100.	
27130	22 - 24	1m	ybry s100	
1	24 - 26	2m	ybry s100	
27132	26 - 28	2m	ybry s100	

EOT AT 28.0m IN RIVER SAND (Covered now)

RIVER SAND BIMODAL DIST WITH ROUNDED PEbbLES (1-2cm),  
AT TOP OF SAMPLE 27126

River sand grains 97% gy.

CHART NO.

HOLE GB 7

15-4m

MAY 16 '80

Chart 100

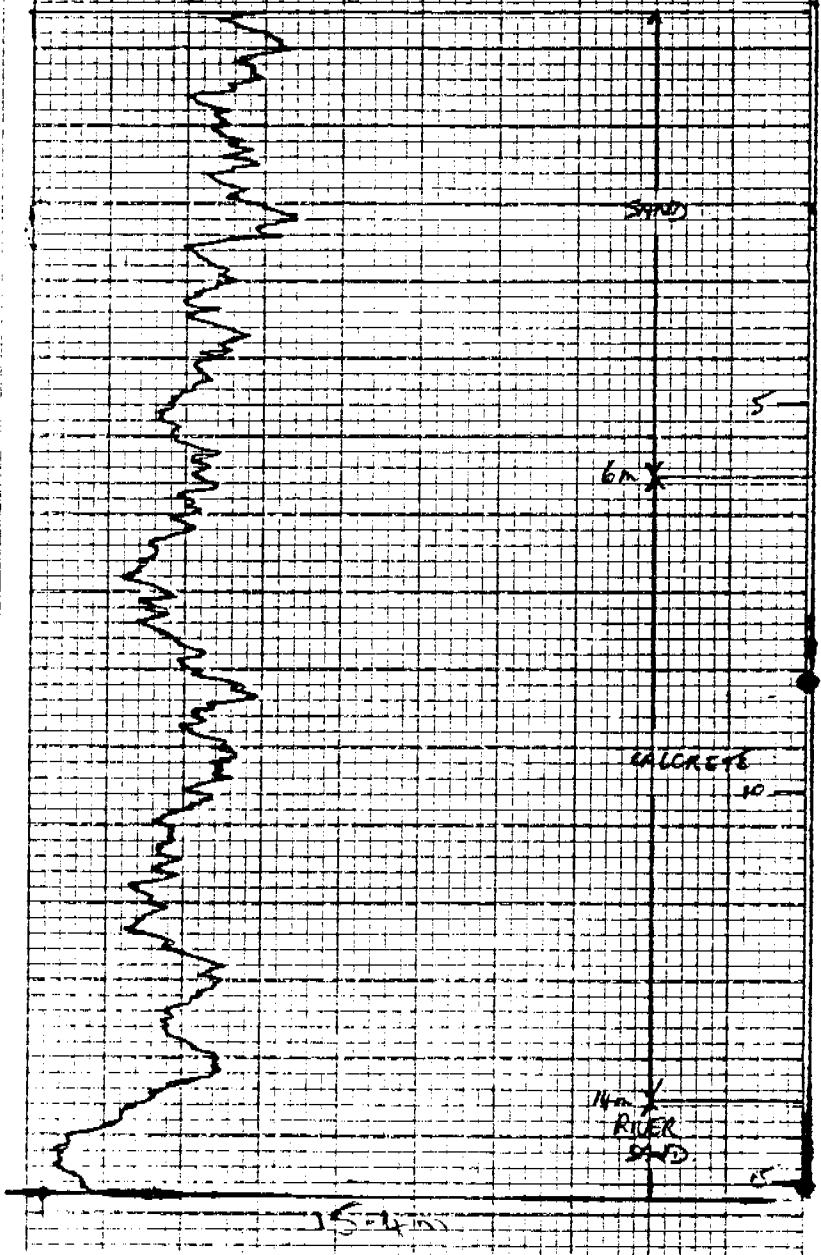
EPS 50

TC 2

W

E

S



101.

HOLE NO: GBR.

DEPTH: 22m

APID CO-OPDS. ON 200 E.

STARTED: 16/5/80. FINISHED: 18/5/80

GAMMA LOG DEPTH = 16.2m.

DRILLING CO: HICKEY DRILLERS.

LOGGED BY: SP

Sample No	Depth metres	Strat. metres	Colour	LITHOLOGY	COMMENTS
27133	0 - 2	2m	lbry	sand, gy to clay.	↑ sand
	4	2 - 4	2m	lbry sand, clayey.	↓ w.
	5	4 - 6	2m	pbry cc so, ss so.	↑
	6	6 - 8	2m	pbry cc so, cl so.	
	7	8 - 10	2m	wh cc so, cl so.	calcareous
	8	10 - 12	2m	pbry cc so, clayey.	↓ ↓
	9	12 - 14	2m	yWb cl so, cc so.	clay
	14 - 16	2m	yW	ss so, cl so.	↑
27140	16 - 18	2m	yW	ss so.	
	18 - 20	2m	yW	ss so.	RIVER SAND
	20 - 22	2m	yW	ss so.	↓

EOT AT 22.0m IN RIVER SAND.  
(COULD NOT PENETRATE).

GB8

CHART SPEED 100

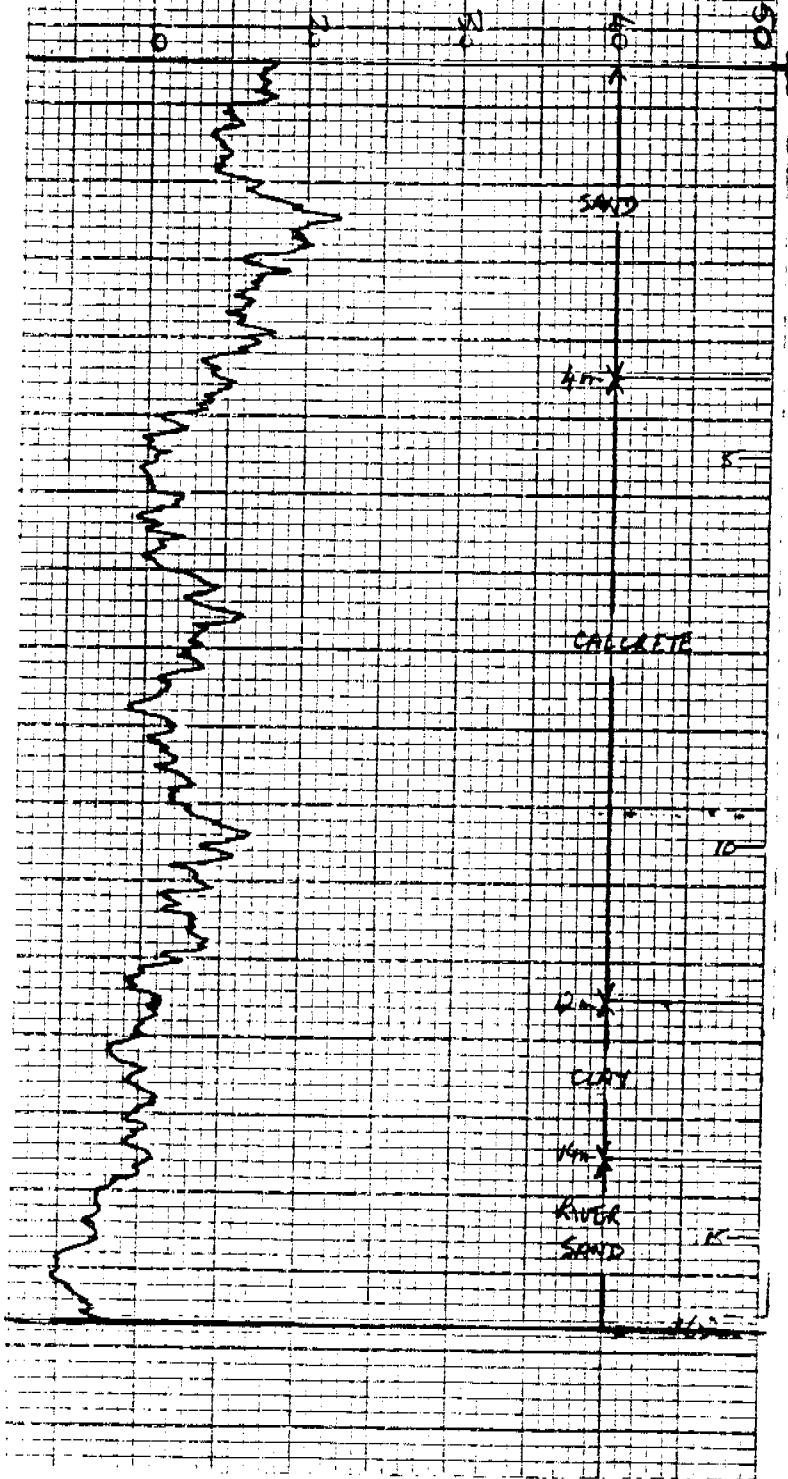
TC=2

50 CPS

16/5/80

6° + CLK

16.2m



HULL NO: GR 9.

CITY COMP. ON RD TWO AND GULF BAY.

CREW: N. T. L. 180 FINISHED: 10/15/48.

DEPTH: 46 fm

GAMMA LOG DEPTH = 46 fm.

WELL CO: HICKEY DRILLERS LOGGED BY CR.

-10.00	Depth m	Inches Col.	Lithology
-9.75	0 - 2	pk	S. 2. <del>4.5</del> gyp 3.
-9.4	2 - 4	bg	gyp <del>9.5</del> S. 1.0
-9.0	4 - 6	bg	gyp 5.0. S. 5.0
-8.7	6 - 8	pk	gyp 9.5 <del>12</del> 15.
-8.4	8 - 10	bg	gyp 7.0 cl. 2.0
-8.1	10 - 12	pk	gyp 9.5 <del>16</del> 3.0
-7.8	12 - 14	pk	gyp 3 - 16.0 cm.
-7.5	14 - 16	pk	gyp 16.0 - 18.0 cm. S. 2.
-7.2	16 - 18	pk	gyp 18.0 - 20.0 cm. S. 5.0
-7.0	18 - 20	y	slgray 8.0 cl. 2.
-6.75	20 - 22	y	slgray.
-6.5	22 - 24	pk	slgray ab. silt 10
-6.25	24 - 26	pk	A. S. 5.0 ab. 5.0
-6.0	26 - 28	pk	S. 2.0 ab. 2.0
-5.75	28 - 30	pk	S. 2.0 ab. 2.0
-5.5	30 - 32	pk	slgray ab. 10
-5.25	32 - 34	pk	ab. S. 1.0 ab. 2.0
-5.0	34 - 36	"	" "
-4.75	36 - 38	"	" "
-4.5	38 - 40	pk	gyp ab. ab. 10

SAND ↑

GYPSUM ↓

CHALCOCITE ↓

PICKET  
GOLD ↓

SCALLOP ↓

SSh ↓

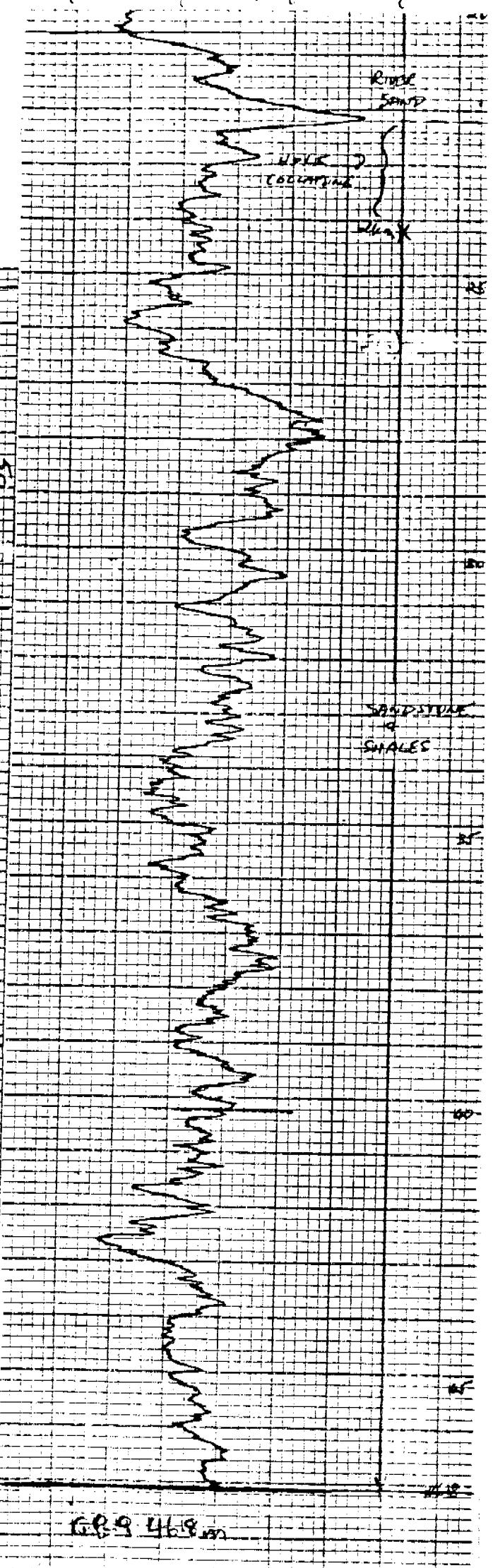
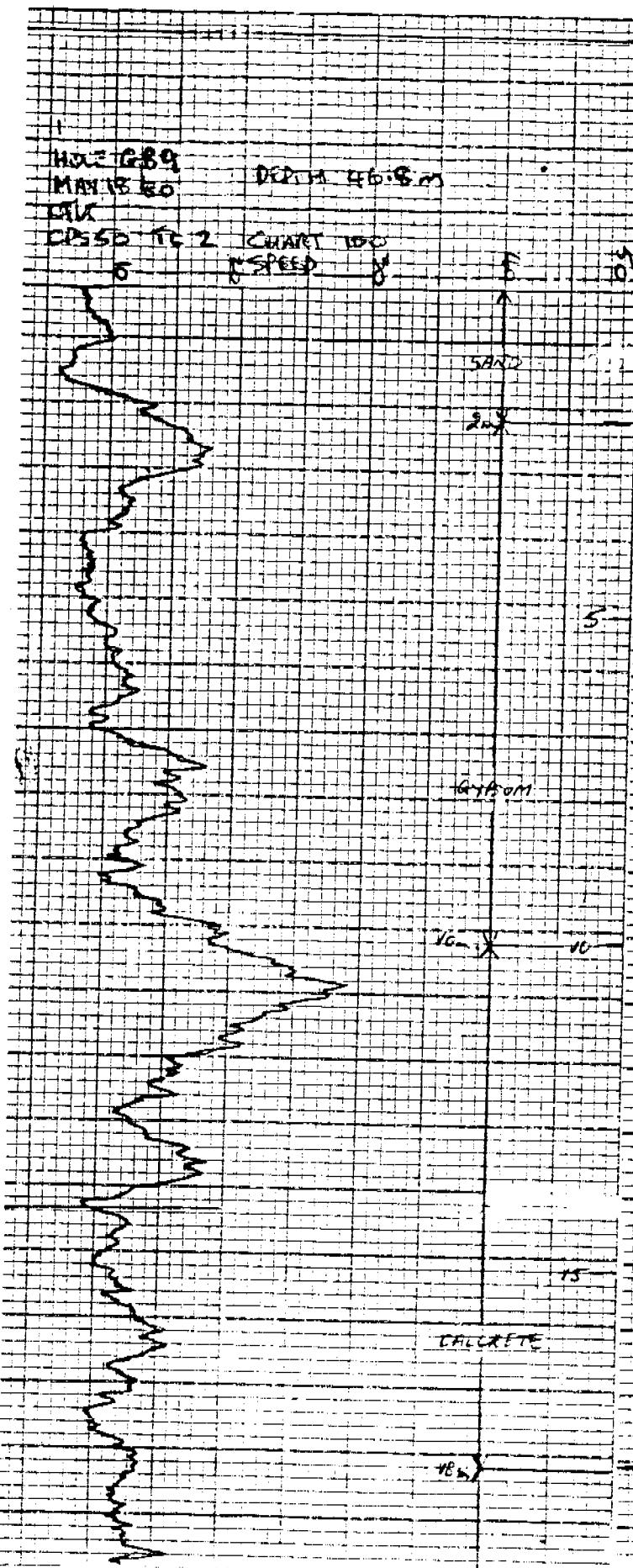
SHo ↓

GFG cont.

Sample No.	Depth in feet	Grain size	Mineralogy	Scattered
61-108	61-112	pk	13-25% loo.	1
"	"	pk	5-10% calcarous	1
"	"	pk	1-5% calcarous	1
"	"	"	"	55%
"	"	"	"	5%
"	"	"	"	5%

COLL AT 50m in HARDSTONE?

SNAILS



PETROGRAPHY

Drill Cuttings

Using a special mounting and impregnation technique, thin-sections were prepared of all the samples, though some were very friable and clayey. Each sample is briefly described in the accompanying table; since the samples were cuttings, mostly of soft material, they contain a high proportion of fine particles and thus the petrological information obtainable is restricted.

Summary

Two of the samples consisted of compact rocks; 29128 is thought to represent fragments of a coarse, sheared quartzofeldspathic gneiss or perhaps granitoid rock, and 29902 is composed of two rounded pebbles, one of which is an indurated feldspathic quartzite, and the other an orthodox microgranite.

The other samples represent more or less unconsolidated sediments, depending on the amount of diagenetic carbonate formed; some are evaporitic and probably lacustrine. All consist of varying proportions of clays, clastic grains (quartz, feldspars, mica flakes), and authigenic/diagenetic carbonate. Two rocks contain crystalline barite aggregates (29097, 29150), and two contain gypsum (29064, 29097), all of authigenic/diagenetic origin, i.e. formed prior to consolidation. Rudimentary concretionary, pelletal and nodular structures are not uncommon.

H.W. Fander, M. Sc.

Sample No.	Rock Type - Composition	Fabric	Minor Minerals	Central Mineralogical Services
				Comments
29017 (T.S. 31948)	<u>Arkosic Carbonate Rocks.</u> Fine angular quartz and feldspar grains, mica flakes, in finely-granular carbonate; many loose, fine fragments.	Rocks probably very friable; some bedding. Fine-grained.	Chlorite or possible glauconite.	Lithology difficult to determine because mostly single clastic grains and pulverised material. Clastic/chemical.
29064	<u>Clay-Carbonate Rocks.</u> Kaolinitic clay with clastic quartz, feldspars, micas; abundant fine authigenic carbonate crystals, nodules, bands.	Confused fabric, with authigenic textures; fine-grained.	Occasional gypsum crystals and coarse aggregates.	Possibly lacustrine deposit, with some evaporite features.
29097	<u>Mixed Sediments, with Gypsum.</u> Argillaceous sandstones, calcareous feldspathic sandstones-sandy limestones; coarse gypsum masses with carbonate.	Very variable fabric, partly concretionary, fine to coarse.	Aggregates of small platy barite crystals, with clay and clastic quartz.	Mixed clastic/chemical rocks with authigenic gypsum, carbonate and barite possibly evaporitic.
29104	<u>Dolomitic Sandstones/Dolomites.</u> Range of compositions. from sandy dolomites to dolomitic sandstones; also ferruginous, micaceous sandstones; some feldspar.	Generally well-sized/sorted; some bedding in places.	Clastic heavy minerals include biotite, garnet, apatite.	Dolomite appears to be diagenetic, possibly replacing earlier calcite; no indication of evaporitic facies.
29116	<u>Calcareous Sandstone Nodules.</u> Fine subangular quartz grains, mica flakes, a few feldspar grains, calcareous cement; ferruginous, clayey cores.	crudely concentric structures with friable cores, more compact rims.	Occasional clastic garnet, biotite; isolated ?glauconite grains.	Metamorphic provenance of clastic grains (29104 also). Nodular structures appear primary.
29128	<u>?Gneiss.</u> Coarse and fine fragments of strongly stressed quartz, microcline, metaquartzite and mylonite.	Thoroughly disrupted; originally coarse-grained, probably gneissic; sheared.	A few grains of indurated, sericitic ortho-quartzite.	Appears to consist of fragments of crushed quartzofeldspathic gneiss, but could have been a granite.
29150	<u>Clay-Carbonate Pellets.</u> Clay host, with embedded clastic quartz, patches of authigenic microcrystalline carbonate (dolomite).	Vaguely nodular or pelletal clay masses and carbonate.	Aggregates of platy barite crystals, of authigenic origin.	Barite probably formed before the carbonate; both developed in unconsolidated clay.
29902 (T.S. 31955)	<u>Quartzite;Microgranite.</u> Larger pebble is quartzite (with leached feldspar); smaller pebble is quartz-microcline-oligoclase microgranite with biotite.	Quartzite is well-sorted, well-cemented. Microgranite is even-grained homogeneous.	Fine hematite associated with chloritised biotite in microgranite.	Microgranite probably orthodox magmatic minor intrusive. Quartzite was feldspathic sandstone verging on arkose.

## OTTER GYPSUM BORE 10-10-79

DETECTOR CUP

READING SERIAL

(1/SQ. MM.) NUMBER FIELD NOTES AND DATA

1. 6	6701.	03S
1. 6	6702.	03S
1. 6	6643.	01NE
3. 3	77840.	07R
3. 3	6709.	01NE
4. 1	6708.	01NE
4. 8	6647.	02NE
4. 9	6641.	01NE
5. 6	6646.	02NE
5. 8	77836.	07R
5. 8	6707.	01NE
6. 4	6703.	03S
6. 6	77826.	20
6. 6	6642.	01NE
6. 6	77835.	07R
6. 6	6706.	01NE
6. 6	6710.	01NE
7. 2	6649.	02NE
7. 2	6650.	02NE
7. 2	77824.	01SE
7. 4	77829.	30
7. 4	77827.	20
7. 4	77830.	30
8. 0	77859.	03NE
8. 0	6704.	03S
8. 0	77852.	02NE
8. 0	6648.	02NE
8. 0	77920.	
8. 8	77841.	03NE
8. 8	77858.	03NE
8. 8	77860.	03NE
9. 9	77834.	40
10. 4	77851.	02NE
10. 7	77825.	20
11. 5	77838.	07R
12. 0	77848.	01NE
12. 4	77831.	30
12. 4	77839.	07R
12. 5	77861.	02N
12. 8	77854.	02NE
12. 8	77884.	
13. 3	77864.	02N
13. 6	6645.	02NE
13. 6	77857.	03NE
13. 6	6644.	02NE
14. 0	77837.	07R
14. 4	77853.	02NE
16. 0	77823.	01SE
16. 8	6705.	03S
16. 8	77917.	

## OTTER GYPSUM BORE 10-10-79

DETECTOR CUP

READING SERIAL

(T/SQ. MM.)

NUMBER FIELD NOTES AND DATA

16. 8	77855.	03NE
16. 8	77822.	01SE
17. 2	77909.	02N
17. 6	77900.	
17. 6	77821.	01SE
17. 6	77856.	03NE
17. 9	77910.	02N
18. 4	77919.	
18. 4	77842.	03NE
19. 2	77916.	
19. 8	77828.	30
20. 0	77845.	03NE
20. 8	77847.	01NE
20. 8	77918.	
21. 4	77833.	40
21. 6	77843.	03NE
21. 6	77893.	
21. 6	77872.	02S
22. 4	77893.	
22. 4	77875.	02S
22. 6	77902.	01N
23. 2	77897.	
24. 0	77911.	
24. 2	77907.	01N
24. 8	77890.	
25. 6	77850.	01SE
26. 4	77888.	
27. 2	77889.	
27. 3	77908.	01N
28. 0	77874.	02S
28. 0	77899.	
28. 8	77906.	01N
28. 8	77849.	01NE
28. 8	77895.	
28. 8	77903.	01N
29. 6	77870.	01S
29. 6	77912.	
29. 6	77913.	
30. 4	77876.	02S
31. 2	77862.	02N
31. 2	77905.	01N
31. 2	77886.	
31. 2	77901.	
32. 9	77891.	
33. 0	77832.	40
33. 5	77869.	01S
34. 5	77894.	
36. 1	77885.	
36. 9	77844.	03NE
36. 9	77881.	

## OTTER GYPSUM BORE 10-10-79

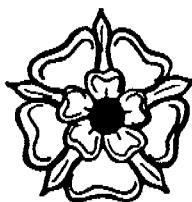
DETECTOR CUP

READING SERIAL

(T/SQ. MM.) NUMBER FIELD NOTES AND DATA

38. 2	77864.	01N
38. 2	77865.	01S
38. 5	77877.	02S
39. 0	77866.	01S
40. 1	77846.	03NE
40. 5	77867.	01S
40. 9	77914.	
40. 9	77873.	02S
41. 7	77915.	
42. 5	77896.	
43. 3	77892.	
44. 4	77863.	02N
44. 9	77879.	03S
45. 2	77868.	01S
51. 3	77887.	
53. 0	77871.	01S
55. 3	77898.	
56. 1	77882.	
60. 1	77880.	03S
84. 1	77878.	02S

ANALYTICAL DATA



A.C.S. Laboratories Pty. Ltd.

50 MARY STREET

UNLEY, S.A. 5061

P.O. BOX 3

UNLEY, S.A. 5061

PHONE: 272 5733

## ANALYTICAL RESULTS

Samples from: Otter Exploration N.L.

Area: N.T.

Samples of: Water and Drill cuttings

Preparation: Disc and pulverise

Sheet No.: 1

Batch No.: A 3427

Date: 4.6.80

SAMPLES WILL BE DISPOSED OF AFTER TWO MONTHS UNLESS WE ARE OTHERWISE ADVISED

Sample Description	U ppm		Sample Description	U ppb	
29010	20		29144	9	
1	<10		29903	<2	
2	20		4	<2	
3	<10		5	38	
4	20		6	12	
5	<10		7	23	
6	20		8	27	
7	<10		9	43	
8	10		29910	53	
20	<10				
5	20				
35	<10				
6	10				
7	10				
8	10				
9	10				
40	<10				
5	10				
50	20				
79	<10				
84	10				
89	10				
93	<10				
104	20				
5	<10				
6	10				
7	10				
8	20				
148	80				
9	80				
50	60				
1	<10				
5	10				
6	10				
7	<10				
8	20				
9	10				
60	10				
1	10				
163	20				
29169	10				
29901	860		White Tint Bar		
Repeat and Check					
29038	10				
148	70				
160	10				

TRACK ETCH DATA  
GYPSUM BORE



October 10, 1979

460 N. Wiget Lane  
Walnut Creek, CA 94598, U.S.A.  
(415) 938-2545 • Telex 33-7793

Dennis Fortowski  
Otter Exploration N.L.  
P. O. Box 1634  
Alice Springs, N.T. 5750  
Australia

Dear Mr. Fortowski,

I am enclosing two sets of final tabulated data from your recent 120 cup Thoron Filtered Track Etch survey of the Gypsum Bore Area. The Track Etch readings are reported in units of tracks per square millimeter (T/sq.mm) and they are normalized to equivalent 30 day exposures. The data have been tabulated in two different ways for easy use; firstly by ascending Track Etch readings and secondly, by ascending serial numbers. The readings ranged from 1.6 to 84.1 T/sq.mm and the mean of the background distribution for the area was 21.0 T/sq.mm. The standard deviation of the background mean was 13.1 T/sq.mm or 62.3%. All statistics on the program are also included on the attached statistics sheet.

The background mean and its standard deviation are related to shallow mineralization of uranium at ppm levels. For this survey the background mean is slightly above the Australian average for original-type cups of 19 T/sq.mm.

High ranking points may be expressed in terms of "Z", the number of standard deviations above background. Rudimentary statistics imply that values with Z greater than three have a very low probability of belonging to the background distribution and hence are anomalous. The range of "Z" for the high ranking points in your survey are shown below together with the more conventional ratio to background.

<u>Range of Z</u>	<u># of Points</u>	<u>Range of T/sq.mm</u>	<u>Range of Ratio to Background</u>
2 - 3	5	51.3 - 60.1	2.4 - 2.9
3 - 4	0		
4 - 5	1	84.1	4.0
Over 5	0		

It is highly improbable that points with Z greater than 3 are part of the background distribution; hence they are almost certainly anomalous. In this survey 1 point has a Z greater than 3, or 0.8% of the total. This, in our experience, is a very low percentage and represents a poor

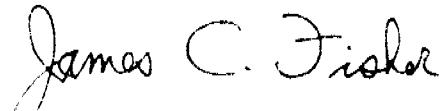
Page 2 - October 10, 1979  
Dennis Fortowski  
Otter Exploration N.L.

potential for mineralization, unless there is strong spatial clustering of high ranking points. The lower overall magnitude of the high ranking points is also not very encouraging, unless the mineralized horizon is very deep or beneath relatively gas-impermeable overburden.

The best thing to do with that semi-loose tape is exactly what you are doing. Press it back on (without touching the detector) before planting. The tape will again seem to come loose but as long as the detector doesn't fall off the cup will function perfectly. The detector falls off very rarely when this technique is followed.

No Track Etch contour map or location-value plot was requested for this program. It has been a pleasure to work with you on this program and we look forward to serving you again in the future.

Sincerely,



James C. Fisher  
Senior Geologist

JCF/kem  
Enclosures

TRACK ETCH<sup>®</sup> SERVICE PROGRAM  
FOR  
GYPSUM BORE AREA

OTTER GYPSUM BORE 10-10-79

TRACK ETCH SURVEY RESULTS AND STATISTICS

VALUES GIVEN IN T/SQ. MM. NORMALIZED TO 30 DAY EXPOSURE

NO. USEFUL PTS. : 120

HIGH (T/SQ. MM. ) : 84. 1

LOW (T/SQ. MM. ) : 1. 6

BACKGROUND MEAN (T/SQ. MM. ) : 21. 0

STD. DEVIATION OF BKG. MEAN (T/SQ. MM. ) : 13. 1

RELATIVE STD. DEVIATION (PERCENT) : 62. 3

HIGH RANKING POINTS

RANGE OF Z	NO. OF PTS.	RANGE OF T	RANGE OF RATIO TO BACKGROUND
2 - 3	5	51. 3 - 60. 1	2. 4 - 2. 9
3 - 4	0		
4 - 5	1	84. 1 - 84. 1	4. 0 - 4. 0
OVER 5	0		

NO. OF PTS. ABOVE Z = 3: 1

PERCENT OF TOTAL PTS. : 0. 8

(Z IS THE NUMBER OF STD. DEVIATIONS ABOVE BKG. MEAN)

OTTER GYPSUM BORE 10-10-79  
 CUP DETECTOR  
 SERIAL READING  
 NUMBER (T/SQ. MM.) FIELD NOTES AND DATA

6641.	4. 9	01NE
6642.	6. 6	01NE
6643.	1. 6	01NE
6644.	13. 6	02NE
6645.	13. 6	02NE
6646.	5. 6	02NE
6647.	4. 8	02NE
6648.	8. 0	02NE
6649.	7. 2	02NE
6650.	7. 2	02NE
6701.	1. 6	03S
6702.	1. 6	03S
6703.	6. 4	03S
6704.	8. 0	03S
6705.	16. 8	03S
6706.	6. 6	01NE
6707.	5. 8	01NE
6708.	4. 1	01NE
6709.	3. 3	01NE
6710.	6. 6	01NE
77821.	17. 6	01SE
77822.	16. 8	01SE
77823.	16. 0	01SE
77824.	7. 2	01SE
77825.	10. 7	20
77826.	6. 6	20
77827.	7. 4	20
77828.	19. 8	30
77829.	7. 4	30
77830.	7. 4	30
77831.	12. 4	30
77832.	33. 0	40
77833.	21. 4	40
77834.	9. 9	40
77835.	6. 6	07R
77836.	5. 8	07R
77837.	14. 0	07R
77838.	11. 5	07R
77839.	12. 4	07R
77840.	3. 3	07R
77841.	8. 8	03NE
77842.	18. 4	03NE
77843.	21. 6	03NE
77844.	36. 9	03NE
77845.	20. 0	03NE
77846.	40. 1	03NE
77847.	20. 8	01NE
77848.	12. 0	01NE
77849.	28. 8	01NE
77850.	25. 6	01SE

OTTER GYPSUM BORE 10-10-79  
 CUP DETECTOR  
 SERIAL READING  
 NUMBER <T/SQ. MM. > FIELD NOTES AND DATA

77851.	10. 4	02NE
77852.	8. 0	02NE
77853.	14. 4	02NE
77854.	12. 8	02NE
77855.	16. 8	03NE
77856.	17. 6	03NE
77857.	13. 6	03NE
77858.	8. 8	03NE
77859.	8. 0	03NE
77860.	8. 8	03NE
77861.	12. 5	02N
77862.	31. 2	02N
77863.	44. 4	02N
77864.	13. 3	02N
77865.	38. 2	01S
77866.	39. 0	01S
77867.	40. 5	01S
77868.	45. 2	01S
77869.	33. 5	01S
77870.	29. 6	01S
77871.	53. 0	01S
77872.	21. 6	02S
77873.	40. 9	02S
77874.	28. 0	02S
77875.	22. 4	02S
77876.	30. 4	02S
77877.	38. 5	02S
77878.	84. 1	02S
77879.	44. 9	03S
77880.	60. 1	03S
77881.	36. 9	
77882.	56. 1	
77883.	22. 4	
77884.	12. 8	
77885.	36. 1	
77886.	31. 2	
77887.	51. 3	
77888.	26. 4	
77889.	27. 2	
77890.	24. 8	
77891.	32. 9	
77892.	43. 3	
77893.	21. 6	
77894.	34. 5	
77895.	28. 8	
77896.	42. 5	
77897.	23. 2	
77898.	55. 3	
77899.	28. 0	
77900.	17. 6	

OTTER GYPSUM BORE 10-10-79  
CUP DETECTOR  
SERIAL READING  
NUMBER <T/SQ. MM. > FIELD NOTES AND DATA

77901.	31. 2	
77902.	22. 6	01N
77903.	28. 8	01N
77904.	30. 2	01N
77905.	31. 2	01N
77906.	28. 8	01N
77907.	24. 2	01N
77908.	27. 3	01N
77909.	17. 2	02N
77910.	17. 9	02N
77911.	24. 0	
77912.	29. 6	
77913.	29. 6	
77914.	40. 9	
77915.	41. 7	
77916.	19. 2	
77917.	16. 8	
77918.	20. 8	
77919.	18. 4	
77920.	8. 0	

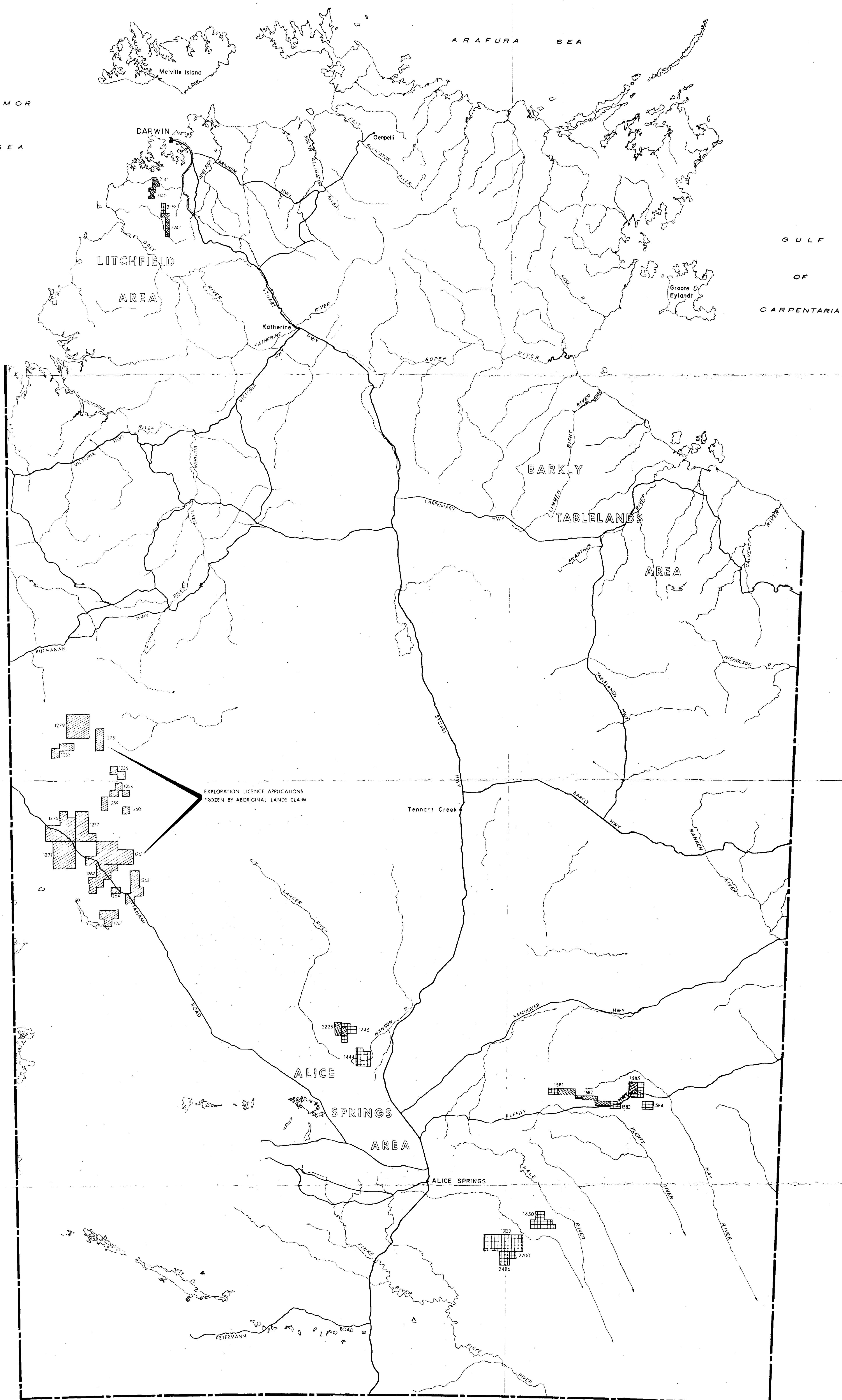


Fig. 1 CR81/99

**OTTER EXPLORATION N.L.**

**LITCHFIELD, BARKLY PROJECTS AND  
TENEMENT LOCATION MAP, N.T.**

Scale 1:2,000,000

0 100 200 KILOMETRES

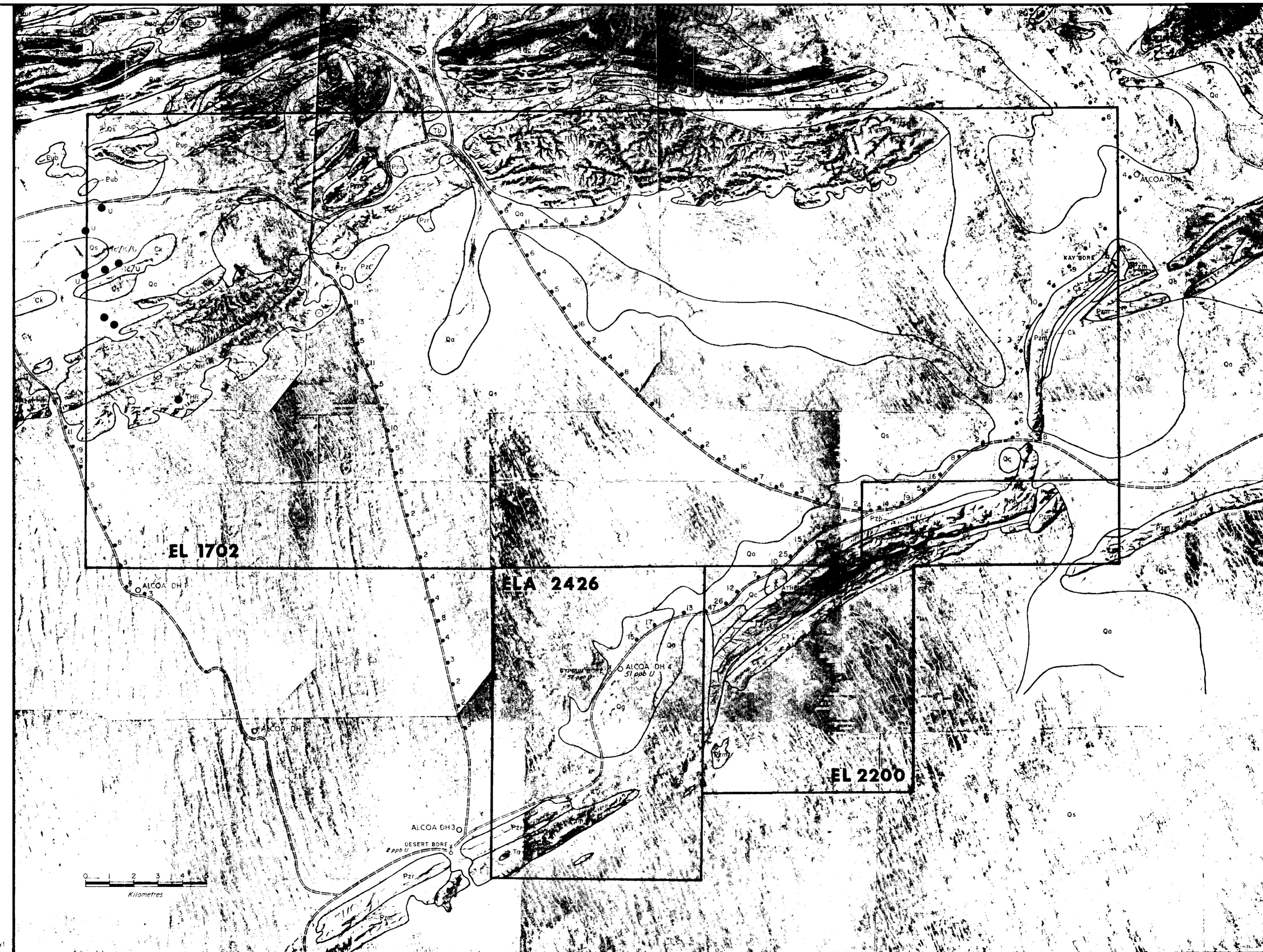
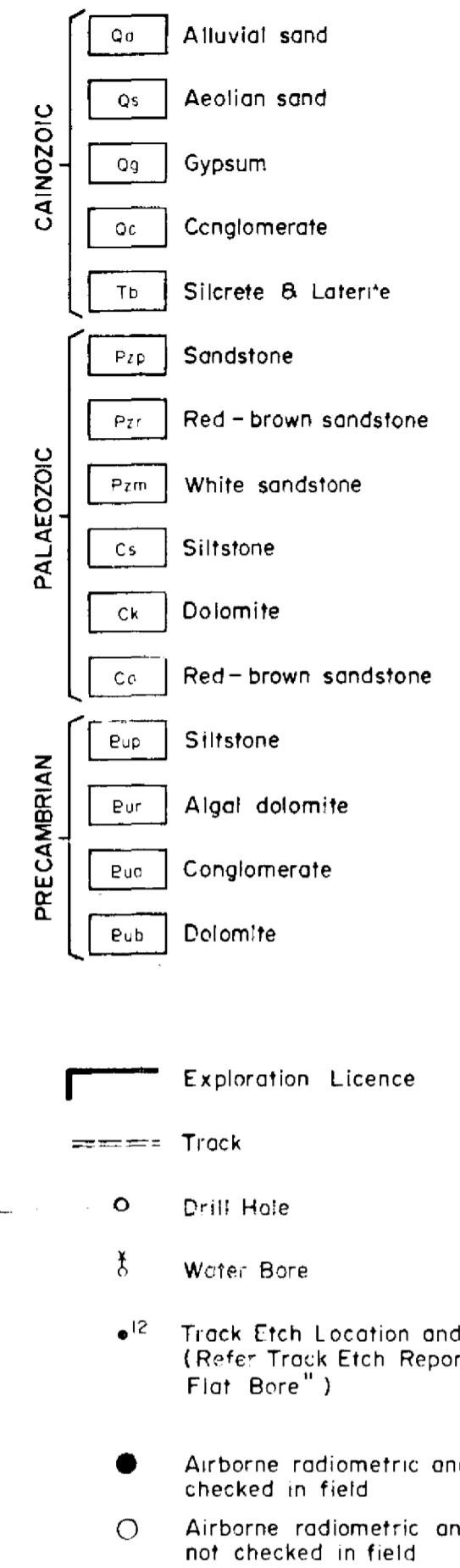
COMPILED C. J. COOAN, JAN 1981

DRAWN CARTOSCOPE

[Cross-hatched square] Current Exploration Licences

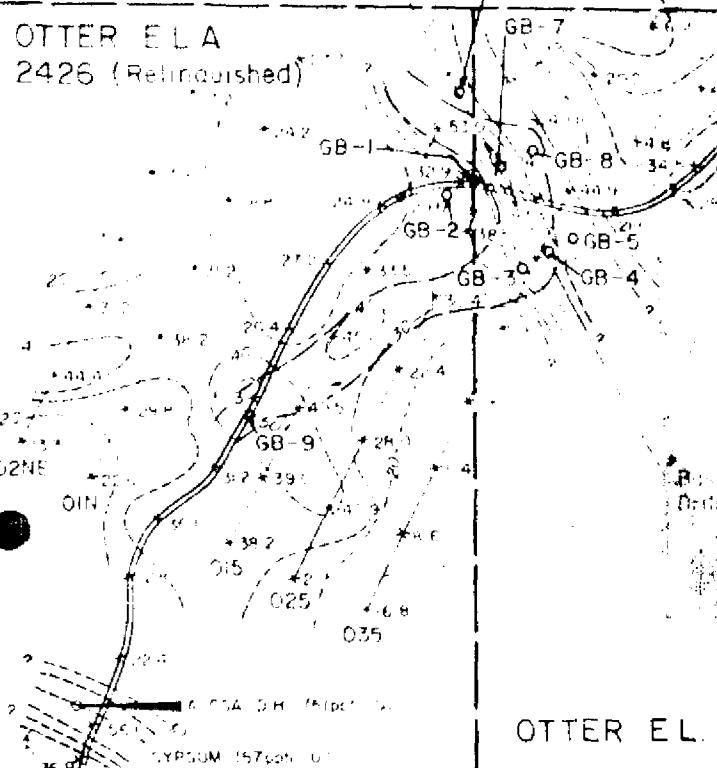
[Diagonal hatching] Exploration Licence Applications

[Grid pattern] Exploration Licences or Applications  
relinquished in 1980



OTTER E.L.1702 (Relinquished)

OTTER E.L.A.  
2426 (Relinquished)



OTTER E.L. 2200 (Relinquished)

