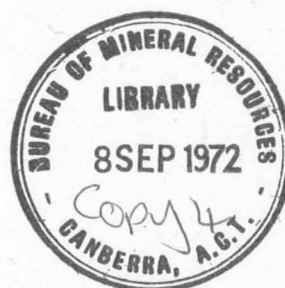


1972/27.

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF
NATIONAL DEVELOPMENT
**BUREAU OF MINERAL
RESOURCES, GEOLOGY
AND GEOPHYSICS**



Record 1972/27

013791

**SHALLOW STRATIGRAPHIC DRILLING IN THE GASON
AND PANDIE PANDIE 1:250 000 SHEET AREAS,
SOUTH AUSTRALIA, 1970**

by

A. Mond

The information contained in this report has been obtained by the Department of National Development as part of the policy of the Commonwealth Government to assist in the exploration and development of mineral resources. It may not be published in any form or used in a company prospectus or statement without the permission in writing of the Director, Bureau of Mineral Resources, Geology & Geophysics.

**BMR
Record
1972/27
c.4**

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Description and interpretation

- BMR GASON 1
BMR GASON 2
BMR GASON 3
BMR GASON 4
BMR GASON 5
BMR GASON 6
BMR GASON 7
BMR GASON 8
BMR GASON 9
BMR GASON 10
BMR GASON 11
BMR GASON 12
BMR PANDIE PANDIE 1
BMR PANDIE PANDIE 2
BMR PANDIE PANDIE 3

Log Pandie Pandie 3 is excluded
from the hardcopy of 1972/27

SUMMARY

Fifteen shallow stratigraphic holes drilled in 1970 in the Gason and Pandie Pandie Sheet areas of the southwestern part of the Eromanga Basin, South Australia, showed that:

- a) Winton Formation underlies most of the Gason and the southeastern part of the Pandie Pandie Sheet area and that it consists of a freshwater sequence of lithic sandstone, siltstone, mudstone and minor coal with Albian to ?Cenomanian microfloras.
- b) Tertiary quartz sandstones up to 35 m thick are present in both Sheet areas.

INTRODUCTION

From the 14 September to the 5 October 1970, shallow stratigraphic drilling was carried out in the southwestern part of the Eromanga Basin in conjunction with regional geological mapping. The mapping was a joint project of the Bureau of Mineral Resources and the South Australian Department of Mines, aimed at producing geological maps of the Gason and Pandie Pandie 1:250 000 Sheet areas. Both these maps will be published by the South Australian Department of Mines.

The main problems in regional geological mapping in this area are lack of outcrop, and deep weathering of exposed rocks. No wireline logs and very little lithological information were obtained from the uppermost 200 to 250 m of two petroleum exploration wells which had been drilled in this area. The shallow stratigraphic drilling was therefore planned so as to collect material for palynological investigation, and to obtain lithological and wireline log information.

BMR GASON 2, 5, 6, 7 and BMR PANDIE PANDIE 2 and 3 were planned to collect fresh material for palynological investigation and to obtain lithological and wireline log information. BMR GASON 3 and 4 and BMR PANDIE PANDIE 1 were planned to establish the presence or absence of Tertiary sediments and their thickness. BMR GASON 8, 9, 10, 11 and 12 were drilled to obtain information of the nature and thickness of the extensive Cainozoic sediment cover.

The drilling plant used was a Fox Mobile B40L operated by the Bureau of Mineral Resources. Cores were taken from the Winton Formation only. Cuttings were collected at intervals of 150 cm while drilling with air, and 300 cm while drilling with water or mud as a circulating fluid. Cores and cuttings were logged out at the well site by the author (BMR GASON 1-5 and BMR PANDIE PANDIE 1-3) and by A. Williams from the South Australian Department of Mines (BMR GASON 5-12). All the cores and cuttings were later examined in Canberra or Adelaide using a binocular microscope. Complete sets of cuttings and slabbed cores are held by both the BMR Core and Cuttings Laboratory, Collie Street, Fyshwick, A.C.T. and the South Australian Department of Mines, Adelaide.

The holes are named in serial order within 1:250 000 Sheet areas, e.g. BMR GASON 6 refers to the sixth hole drilled by the Bureau of Mineral Resources in the Gason 1:250 000 Sheet area.

RESULTS

Statistical data relating to each hole together with a summary of the section penetrated are given in Table 1, and graphic logs in Appendix 1.

Winton Formation

The Winton Formation appears to have been the last Cretaceous unit to have been deposited throughout the Eromanga Basin. The drilling established that the unit is present in the subsurface in most of the Gason Sheet area and in the southeastern part of the Pandie Pandie Sheet area.

In this part of the basin fresh samples from the drilling reveal that the sequence consists of interbedded fine to coarse-grained lithic sandstone, siltstone, and mudstone, and very minor coal. In general the sequence is grey to greenish grey, carbonaceous, and pyritic. The coal is soft bituminous and only a few centimetres in thickness. The upper part of the unit is commonly kaolinized, silicified, or ferruginized, as a result of late Cretaceous deep weathering.

The lack of marine fossils and the presence of abundant fragmentary plant material (Senior, Galloway, Ingram, & Senior, 1963) suggest that the Winton Formation is a freshwater sequence, and this is supported by palynological studies. Harris (1971) has suggested that all but one of the assemblages from cores taken in the Winton Formation (Table 2) reflect a lacustrine environment of deposition. The assemblage from core 1, BMR GASON 2, has a much lower species diversity, reflecting swampy conditions with minimal water transport of species belonging to other environments.

Harris (1971) made a palynological examination of cores from the Winton Formation (Table 2). The preservation and yield of sporomorphs was generally very good. He assigned all assemblages to the Tricolpites pannosus Zone of Albian-Cenomanian age (Dettmann & Playford, 1969). Recycled middle-late Triassic sporomorphs are present in most samples, and the source of these is considered to have been in the northern Flinders Ranges.

Tertiary rocks

Tertiary rocks form scattered mesas and escarpments throughout the area, and the drilling established their presence in the subsurface in both Gason and Pandie Pandie Sheet areas, where they are up to 35 m thick. The rocks are almost entirely quartz-rich sandstone, fine to coarse-grained, and commonly they have a clayey matrix. Thin beds of light grey mudstone are interbedded with the sequence in BMR PANDIE PANDIE 2. In some areas the sandstone is poorly cemented and friable, but in general it is silicified and in places it grades into silcrete (Senior & Senior, 1972).

Quaternary sediments

Most of the area is covered by Quaternary sediments which consist of reddish brown calcareous soil, yellowish and reddish brown, coarse-grained quartzose sand, calcareous and sandy clay, silcrete gravel ('gibbers'), and some chalcedonic limestone or chemically altered calcareous mudstone. Crystalline or amorphous gypsum is distributed throughout these sediments. The drilling indicates that the amount decreases from south to north.

Wireline logging

BMR GASON 2, 5, 6, 7, and BMR PANDIE PANDIE 2 and 3 were logged with a 'Well-reconnaissance Suitcase Logger (Model 9246)'. After logging BMR GASON 2 and PANDIE PANDIE 2 the gamma-ray probe became inoperative and only self-potential and single point resistivity logs were run in the remaining holes.

BMR GASON 2 and BMR PANDIE PANDIE 2 and 3 penetrated Quaternary, Tertiary, and Cretaceous (Winton Formation). In the first two holes there is a good contrast between Tertiary and Winton Formation. In BMR PANDIE PANDIE 3 the sandstone believed to be Tertiary is very soft, virtually unconsolidated sand, saturated with water, and there is no difference in electric log characteristics between the two units. BMR GASON 5, 6, and 7 were drilled almost entirely in the Winton Formation, which, being a relatively uniform sequence of interbedded sandstone, siltstone, and mudstone, gives only a little contrast on wireline logs; for this reason wireline logging within the Winton Formation was not particularly useful.

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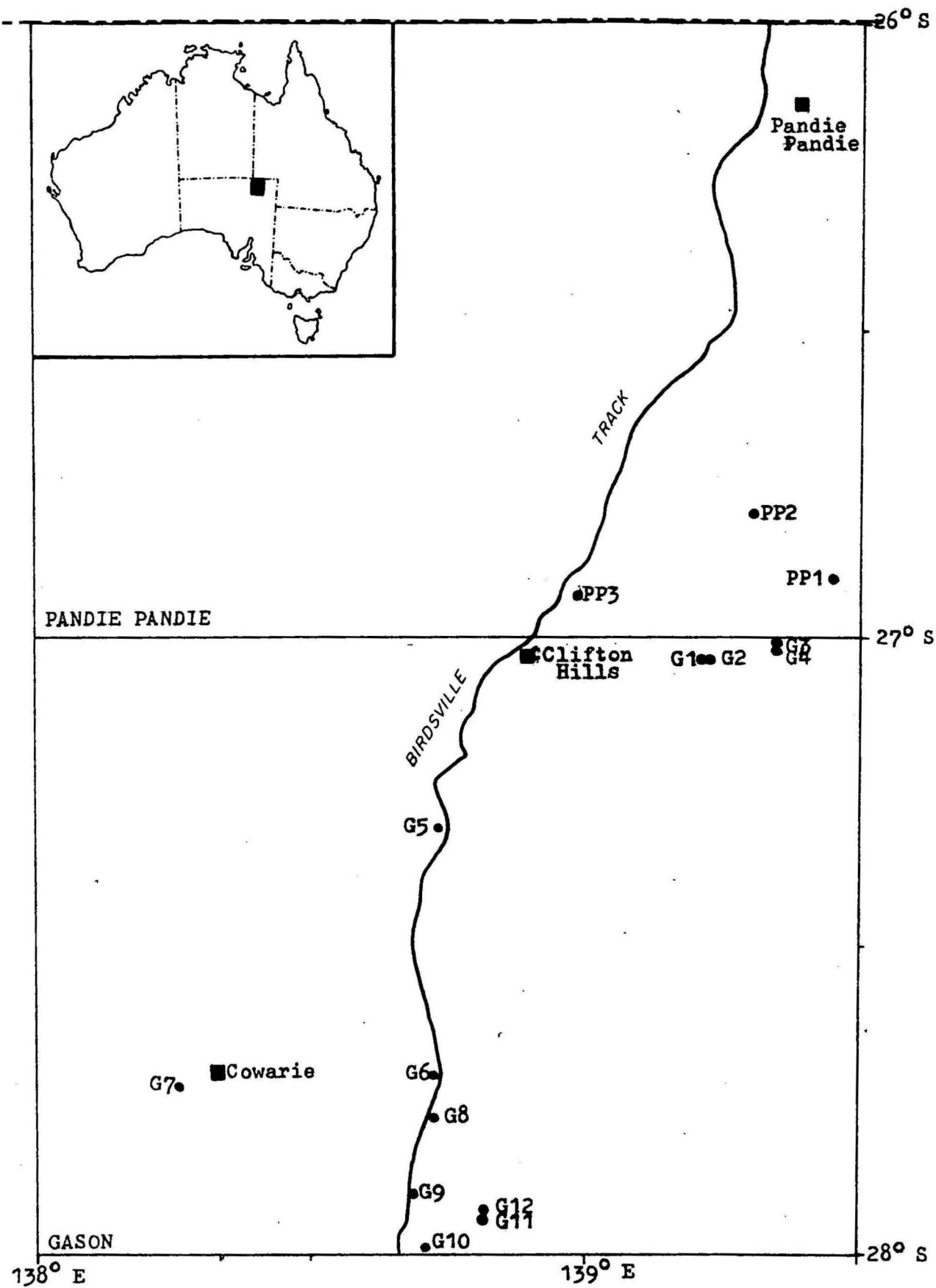
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Table I Summary of Drilling

HOLE & NUMBER	LATITUDE	LONGITUDE	TOTAL DEPTH IN METRES	DRILLING IN METRES	COPING IN METRES	CORE NUMBERS	CORE RECOVERY		RESULTS
							ACTUAL	%	
BMR GASON 1	27°02'00"	139°14'30"	18.3	18.3	-	-	-	-	0.0 - 1.5 Sand. 1.5 - 3.0 Gibbers, silcrete, quartzose sandstone. 3.0 - 7.0 Sand (? v. s ft, for SST) 7.0 - 18.3 Quartzose sandstone
BMR GASON 2	27°02'00"	139°14'30"	152.4	144.7	7.7	1	4.6 3.1	100 100	0.0 - 3.0 Silcrete, silicified sandstone. 3.0 - 32.0 Quartzose sandstone - Tertiary. 32.0 - 152.4 Winton Formation.
BMR GASON 3	27°00'12"	139°21'00"	24.4	24.4	-	-	-	-	0.0 - 5.6 Sand, minor gypsum. 5.6 - 7.6 Chemically altered Winton Formation. 7.6 - 24.4 Winton Formation.
BMR GASON 4	27°00'20"	139°21'00"	20.1	20.1	-	-	-	-	0.0 - 1.2 Gibbers, sand. 1.2 - 16.8 Quartzose sandstone - Tertiary. 16.8 - 20.1 Winton Formation.
BMR GASON 5	27°19'30"	138°44'30"	47.2	42.7	4.5	1	3.1	70	0.0 - 3.0 Soil, gibbers, gypsum. 3.0 - 47.2 Winton Formation.
BMR GASON 6	27°43'00"	138°43'30"	152.4	143.3	9.1	1 2 3	3.1 0.3 3.1	100 10 100	0.0 - 152.4 Winton Formation
BMR GASON 7	27°44'00"	138°15'00"	152.4	146.3	6.1	1 2	1.2 2.9	40 95	0.0 - 6.1 Sand. 6.1 - 12.2 Clay. 12.2 - 152.4 Winton Formation.
BMR GASON 8	27°46'24"	138°42'54"	12.2	12.2	-	-	-	-	0.0 - 12.2 Winton Formation.
BMR GASON 9	27°53'42"	138°40'42"	12.2	12.2	-	-	-	-	0.0 - 3.0 Soil, gibbers, gypsum. 3.0 - 12.2 Winton Formation.
BMR GASON 10	27°59'39"	138°42'54"	9.1	9.1	-	-	-	-	0.0 - 5.8 Clay, gypsum, some limestone. 5.8 - 9.1 Winton Formation.
BMR GASON 11	27°56'42"	138°49'00"	12.2	12.2	-	-	-	-	0.0 - 5.6 Sand, crystalline gypsum. 5.6 - 12.2 Winton Formation.
BMR GASON 12	27°55'42"	138°49'00"	10.7	10.7	-	-	-	-	0.0 - 4.6 Sandy soil, gibbers, gypsum, clay. 4.6 - 10.7 Winton Formation.
BMR PANDIE PANDIE 1	26°54'21"	139°27'12"	16.8	16.8	-	-	-	-	0.0 - 4.6 Sand, gypsum. 4.6 - 9.1 Chemically altered siltstone and sandstone. 9.1 - 16.8 Silicified sandstone into feldspathic sandstone (Winton Formation).
BMR PANDIE PANDIE 2	26°47'51"	139°18'27"	70.1	67.0	3.1	1	2.1	70	0.0 - 5.2 Sandy soil, gibbers, gypsum, clay. 5.2 - 39.6 Quartzose sandstone, minor mudstone - Tertiary. 39.6 - 70.1 Winton Formation.
BMR PANDIE PANDIE 3	26°56'09"	138°59'00"	70.1	70.1	-	-	-	-	0.0 - 3.0 Soil, sand, quartzose sandstone. 3.0 - 27.4 Quartzose sandstone - Tertiary. 27.4 - 39.6 Chemically altered Winton Formation. 39.6 - 70.1 Winton Formation.
TOTAL			780.6	750.1	30.5	0	23.5 av.	76	

TABLE 2 - Results of palynological analysis (based on Harris, 1971).

Hole & Number	Depth in metres	Sample No.	Palynological Zone
BMR GASON 2	80.0	S2219	? <u>Tricolpites pannosus</u>
	151.3	S2225	<u>T. pannosus</u>
	152.4	S2221	Barren
BMR GASON 5	43.4	S2223	? <u>T. pannosus</u>
	45.7	S2224	" "
BMR GASON 6	61.2	S2217	<u>T. pannosus</u>
	63.1	S2218	" "
	106.7	S2240	" "
	151.8	S2222	" "
BMR GASON 7	90.1	S2227	? <u>T. pannosus</u>
	150.4	S2226	<u>T. pannosus</u>
	151.5	S2220	" "



LOCALITY MAP

APPENDIX 1

GRAPHIC LOGS

ABBREVIATIONS

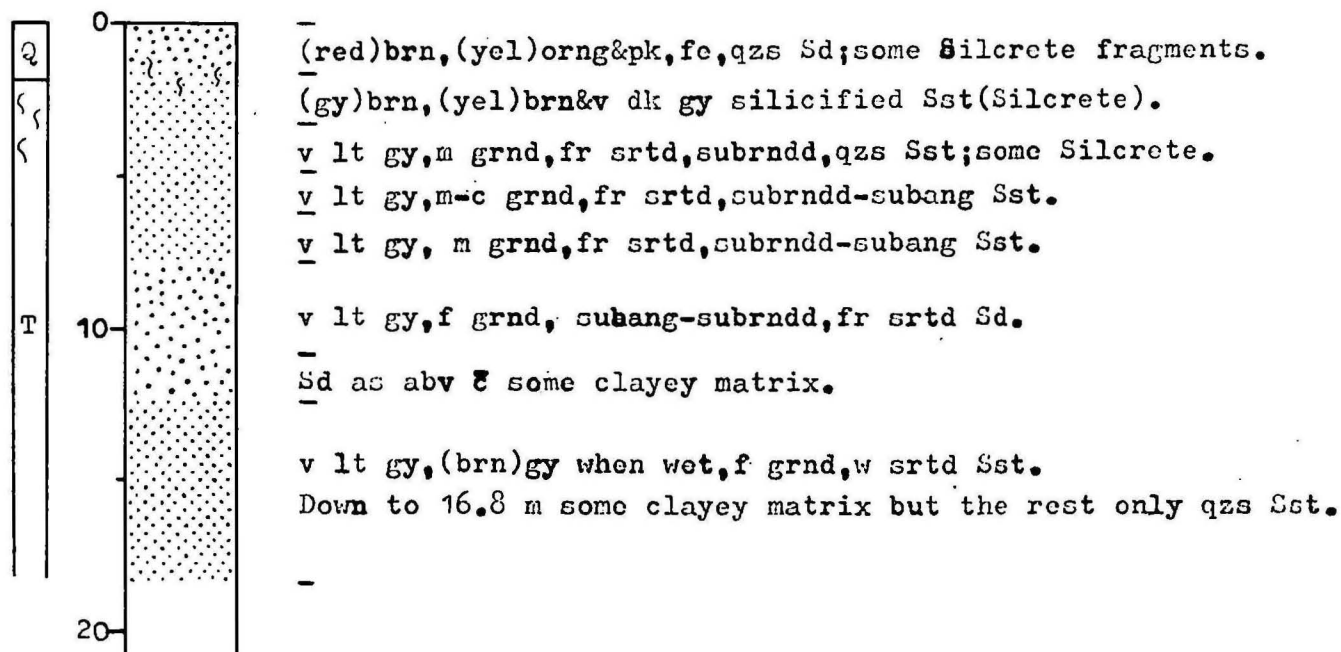
Above	adv	Matrix	mtx
Abundant	abd	Medium	m
Altered	altd	Mica (ceous)	Mic, mic
And	&	Minor	mnr
Angular	ang	Moderate	mod
Black (ish)	blk, (blk)	Mudstone	Mdst
Blue (ish)	bl, (bl)	Olive	olv
Brown (ish)	brn, (brn)	Orange	orng
Carbonaceous	carb	Pale	pl
Clay (ey)	Cl, cl	Pink (ish)	pk, (pk)
Coarse	c	Poor	p
Chemically	chem	Purple	purp
Dark	dk	Pyrite	Pyr
Decrease (ing)	Decr, decr	Quartz	Qz
Fair	fr	Quartzose	qzs
Feldspar (thic)	Fld, fld	Rounded	rndd
Iron oxide minerals	Fe	Sand (y)	Sd, sd
Ferruginous	fe	Sandstone	Sst
Fine	f	Secondary	sec
Friable	fri	Siltstone	Sltst
Glauconite (ic)	Glau, glau	Soft	sft
Grained	grnd	Soil	Sl
Grey (ish)	gy, (gy)	Sorted	srted
Green (ish)	gn, (gn)	Subangular	subang
Gypsum (iferous)	Gyp, gyp	Subrounded	subrndd
Hard	hd	Very	v
Increase (ing)	Incr, incrg	Weathered	wthrd
Interbedded	intbdd	Well	w
Intercalated	intold	White (ish)	wh, (wh)
Laminated	lamd	With	c̄
Light	lt	Yellow (ish)	yel, (yel)

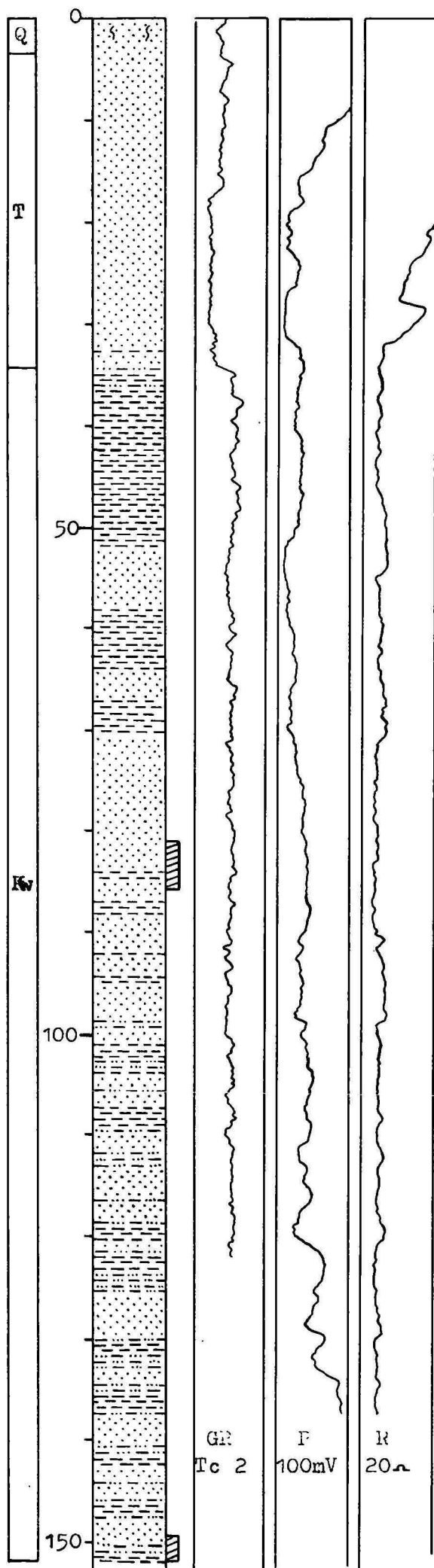
GEOLOGICAL SYMBOLS USED IN THIS RECORD

	Chemically altered material		Cored interval showing recovery
	Soil	G	Gypsum
	Sand	*	Sample for palynology
	Clay and clayey, gypsiferous material	GR	Gamma ray
	Sandstone	P	Self-Potential
	Siltstone	R	Single point resistivity
	Mudstone	Q	Quaternary
	Coal or carbonaceous material	T	Tertiary
	Limestone or calcareous material	Kw	Cretaceous - Winton Formation

DESCRIPTION AND INTERPRETATION

BMR GASON 1





(brn)red, (yel)brn Silcrete&silicified Sst; Gy.
v lt gy, (yel)brng, f-c grnd, p srtcd, qzs Sst.
v lt gy, m grnd, cl, qzs Sst.

(gy)brn, m-f grnd, w srtcd, qzs Sst.

(red)brn, (gy)brn&pk, qzs Sst.

(gy)brn, qzs Sst c v lt - mod gy, cl matrix.
(brn)gy, fe<-mod gy, m-c grnd, fr srtcd, cl Sst.

mod-dk gy, olv, some purp Mdst.

olv gn, m grnd, fld Sst.
olv gn, m grnd, lithic Sst.

olv gn Mdst c (yel)brn coating (Fe).

(gn)gy, lithic Sst; fe.

lt gy&olv Mdst; fe.

lt gy Mdst&(brn)gy Sst; fe.

(gy)gn, m grnd, cl Sst.

blk&(yel)brn, earthy, lithic Sst; carb material.

△ CORE 1, recovery 100%. (gy)gn, v f grnd, lithic Sst; carb material, some Mdst.

(gn)gy Sst&(brn)gy Mdst; carb material.

Also some lt (yel)brn, (pk)brn Sst&olv-(yel)brn Sst c gn tint.

(gy)gn, carb Sst(40%); lt (brn)gy Sltst c pk tint(40%); gn Sltst or Mdst(20%).

- dk gy&(gn)gy, carb Sst&Sltst(95%);

- lt gy, cl Sltst&Mdst(5%).

dk (gn)gy, f grnd, w srtcd, carb&lithic Sst(70%);

dk (gy)gn Sltst&v lt (brn)gy Sltst.

as abv - more of lt (brn)gy Sltst c pk tint.

Also (yel)brn Sltst or Mdst which is increasing

as abv - (gy)gn, carb Sst c dk gy Sst&Sltst; (yel)brn Mdst is quite abd, also some (brn)gy-pk Mdst c coal; fe concretions.

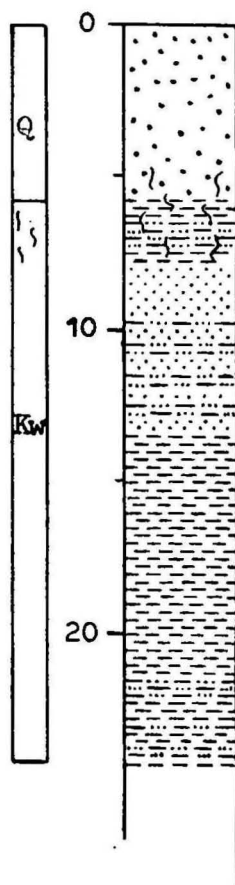
as abv - (gn)gy&dk gy, carb Sst(90%);

-lt gy Sltst&Mdst(10%); mnr fe concretions.

as abv - increase of gn Mdst.

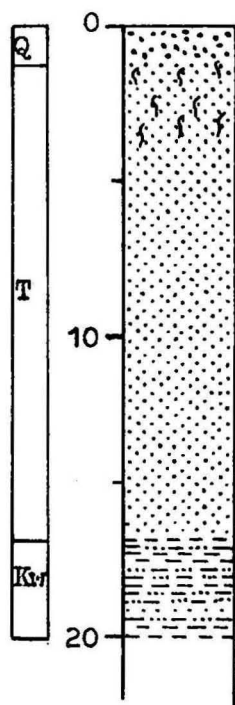
△ CORE 2, recovery 100%. as abv.

BMR GASON 3



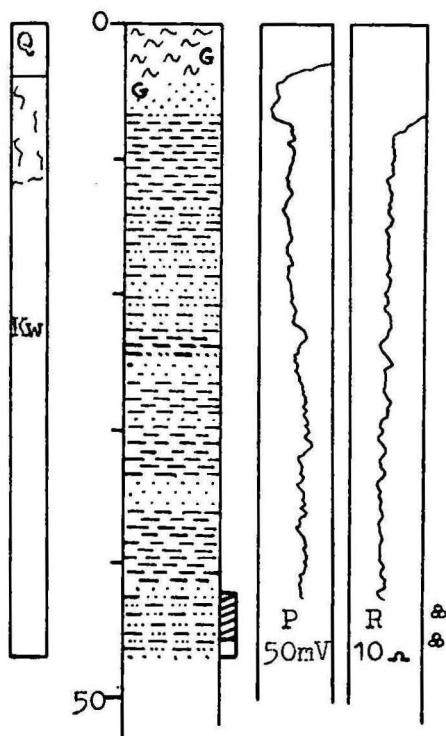
- mod brn, m-c grnd, w srtd, qzs Sd.
- as abv - c pk tint&clayey material.
- (yel)brn Sd c some Gypsum.
- as abv + silicified Sltst&Mdst.
- v lt gy, m-c grnd, feldspathic Sst.
- as abv but finer (Sltst?).
- lt-mod gy, v f grnd, feldspathic Sst&Sltst.
- lt-mod gy, feldspathic Sst, Sltst&Mdst; water injection.
- (brn)gy Mdst.
- (brn)gy Mdst c purple tint&dk (brn)gy Mdst.
- purp Sltst&Mdst.

BMR GASON 4

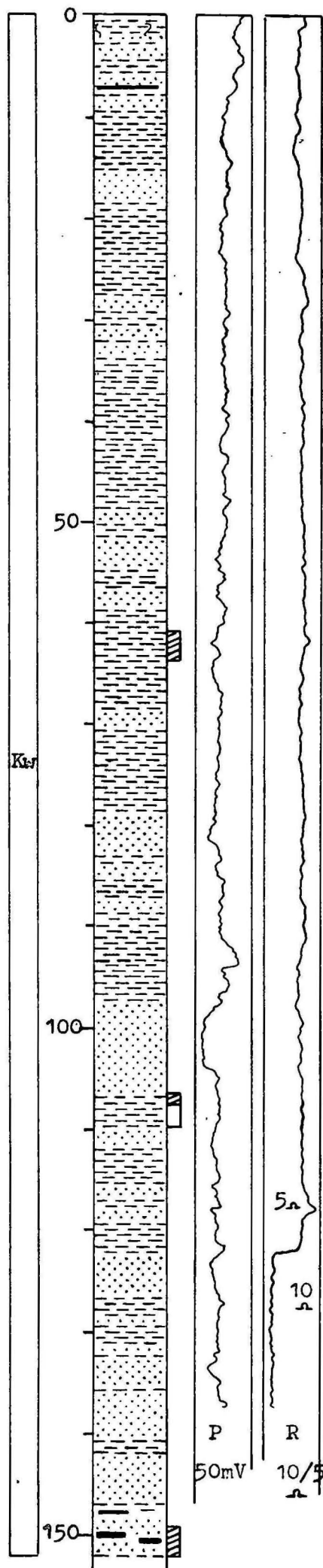


- few cm of gibbers, then (brn)red Sd.
- silicified qzs Sst (Silcrete).
- Silcrete&qzs Sst.
- qzs Sst.
- lt gy, qzs Sst. At 11.3 m layer of (yel)brn, v sft&fri Sst, which becomes darker from 13.7 m.
- (brn)gy-purp, clayey Mdst, Sltst or v f Sst
- (red)gy-purp, clayey Mdst, Sltst&v f grnd Sst.
- olv gy, clayey Mdst.

BMR GASON 5



- red-brn Sl, gibbers, some Gyp (crystalline & powder), cl mtz.
 withrd, fld Sst & off-wh, f-m grnd, qzs Sst; cl material, Gyp.
 Sst into multicoloured Mdst, Sltst & Sst (fe); some Gyp.
 yel Mdst, some purp & red mottling.
 pl (yel) wh Mdst & soft Sltst.
 wh Mdst & Sltst, (brn) yel, labile Sst; strongly withrd.
 as abv - labile Sst increasing.
 - wh & pl yel Mdst, fld Sst, some ironstone.
 as abv without ironstone; dk gy lumps of Mdst.
 lt-m gy Mdst.
 m gy Mdst & some darker labile Sst.
 m-dk gy Mdst, some (gn) material.
 - gy Sltst gradually into yel then again gy at 45.5 m;
 - in bottom part some labile Sst.



pl & dk gy Mdst, lt gy-(brn) yel, lamd, fld Sst, mnr Gyp.

dk gy Mdst & fld Sst, (gn) tint from 7.6 m; mnr coal.

(gn) gy & brn Mdst.

gy, fld Sst; Pyrite.

(gn) gy Mdst, some fld Sst; carb remains.

lt gy, fld, carb Sst & some (gn) gy Mdst.

(gn) gy Mdst; Pyrite. (brn) gy Mdst at 45.1 m.

carb, fld Sst; (gn) gy & gy, carb Mdst; Pyrite.

(gn) gy, fld Sst & Mdst.

CORE 1, recovery 100%. dk gy, carb Mdst.

dk gy & (gn) gy, carb Mdst.

gy, fld Sst & (gn) gy, carb Mdst; Pyrite.

(gn) gy, carb Mdst; Pyrite.

(gn) gy, fld Sst; mnr (brn) gy Mdst; Pyrite, carb material.

as abv - Mdst increasing.

(gn) gy & lt gy, carb Mdst.

gy, fld Sst, possibly glau; Pyrite, carb material.

CORE 2, recovery 10%. gy Mdst & gn, fld, carb Sst.

(gn) gy & pl gy Mdst, fld Sst, carb material.

pl gy & (gn) gy, carb Mdst; mnr fld Sst.

(brn) gy, hd Mdst & (gn) gy Sst.

(gn) gy, fld Sst & some (gn) gy & (brn) gy Mdst.

as abv - Sst decreasing.

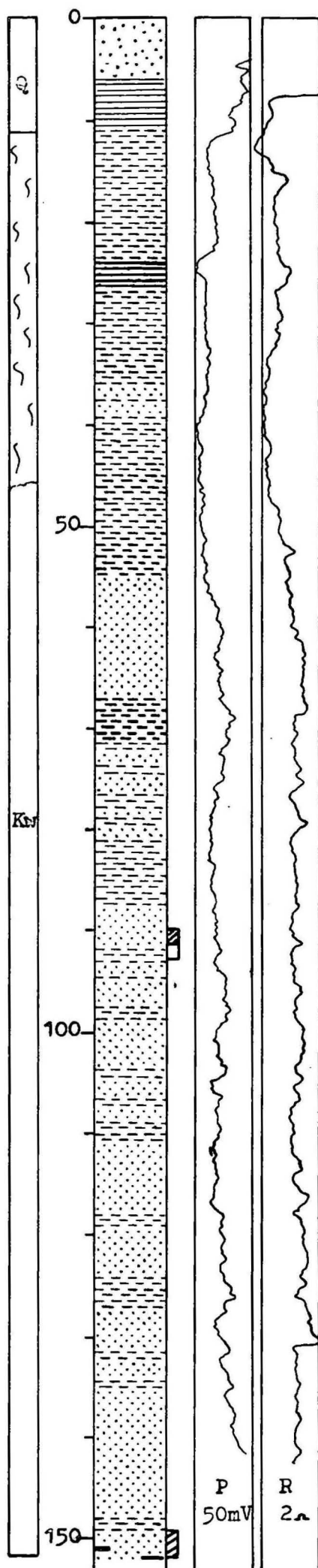
(gn) gy, fld Sst & some pl gy Mdst.

(gn) gy, fld Sst; Pyrite, carb material.

(gn) gy Mdst & fld Sst, pl gy Mdst; Pyrite, carb material.

(gn) gy, fld Sst & mn gy Mdst & carb material.

CORE 3, recovery 100%. as abv - abd coal & carb material.



hd, lt gy&yel, cl, qzs Sd.

(red)brn, cl Sd & fe material.

(pk)brn&olv gy Cl & ironstone fragments.

olv gy-gn Mdst & dk (red)brn, fe fragments.

as abv - mottled, wh&purp Mdst; hd band at 21 m.

mottled, yel, brn&wh Cl; change of colour.

wh&yel, f grnd, silicified Sst.

mottled, wh brn&purp red Mdst.

mottled, red&wh Mdst,

in bottom part yel< gy Mdst.

lt gy&(gy)gn, fld Sst.

(yel)gy Mdst&(gn)gy, fld Sst.

gy Mdst&(gn)gy, fld Sst.

CORE 1, recovery 40%. (gn)gy, fld, carb Sst&m gy Mdst.
m gy Mdst&(gn)gy, fld, carb Sst.

(gn)gy, fld Sst&Mdst.

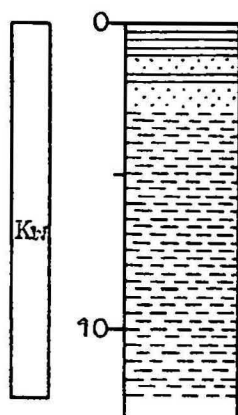
(gn)gy, fld Sst.

as abv + m gy&(gn)gy Mdst.

(gn)gy, fld, carb Sst&some Mdst.

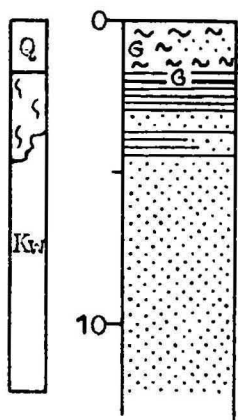
CORE 2, recovery 95%. mostly (gn)gy, fld Sst &
bands of m gy, carb Mdst.

BMR GASON 8



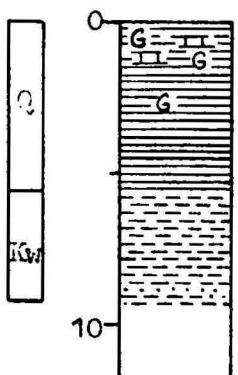
-
 yel, powdery Cl&wthrd, fld Sst c̄ crystalline&powdery Gypsum.
 as abv - more Sst&ldst, less Gypsum, slightly darker.
 -
 yel-gy ldst c̄ Gypsum bands; some carb material.
 -
 yel&gy ldst, little Gypsum; at 8.8 m change to dk gy ldst.
 m-dk gy ldst.
 -

BMR GASON 9



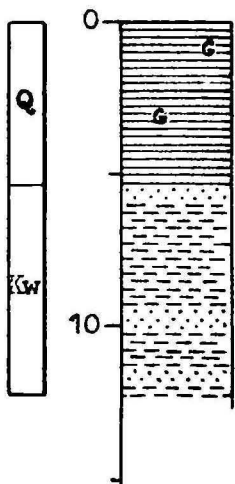
-
 (red)brn, calc Sl; Gypsum; silicified Sst fragments; odd gibbers.
 crystalline Gypsum&some pl yel-off wh clayey material.
 gypsiferous Clay; few fragments of wthrd, fld Sst.
 mottled, (yel)gy&brn, wthrd, fld Sst, v clayey, some Gypsum.
 (gy)yel, wthrd, fld Sst c̄ small amount of Gypsum.
 as abv - dk yel Sst, some ironstone fragments, less wthrd.
 n grnd, wthrd, fld Sst c̄ dark&light bands - possibly due to
 a varying proportion of Fe; no Gypsum.
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BMR GASON 10



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 pl brn, calcareous Clay&Gypsum; some Limestone.
 off-wh, slightly calcareous Clay c̄ crystalline Gypsum.
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 darker Clay than abv, slightly calcareous, less Gypsum.
 pl gy & lt gy ldst.
 thin band of partly fe, (yel)gy ldst&some fld, malinized Sst.
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BMR GASON 11



(red)brn sandy Clay&thick crystalline Gypsur.

Gypsum dominant, some off-white Clay.

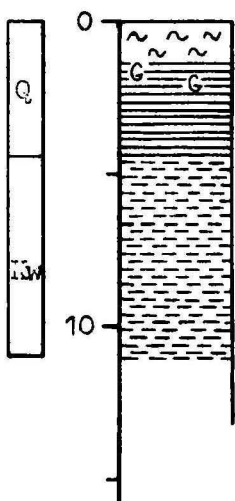
Gypsum decreasing, pl gy Mdst increasing, some wthrd, cl, fld Sst.

pl gy Mdst, minor Gypsum.

as abv + some wthrd, fld Sst.

pl (yel)gy Mdst&fld Sst; few (yel)bands - fe.

BMR GASON 12

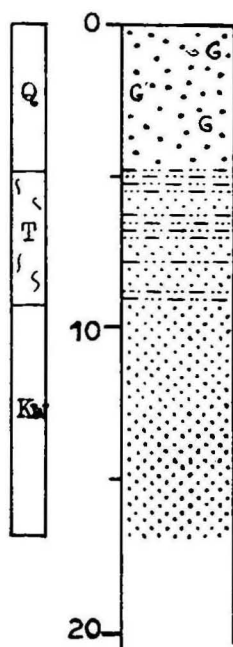


pl (red)brn, calc, sandy Sl&gibbers.

crystalline Gypsum; pl yel-off wh Cl; slightly calcareous.

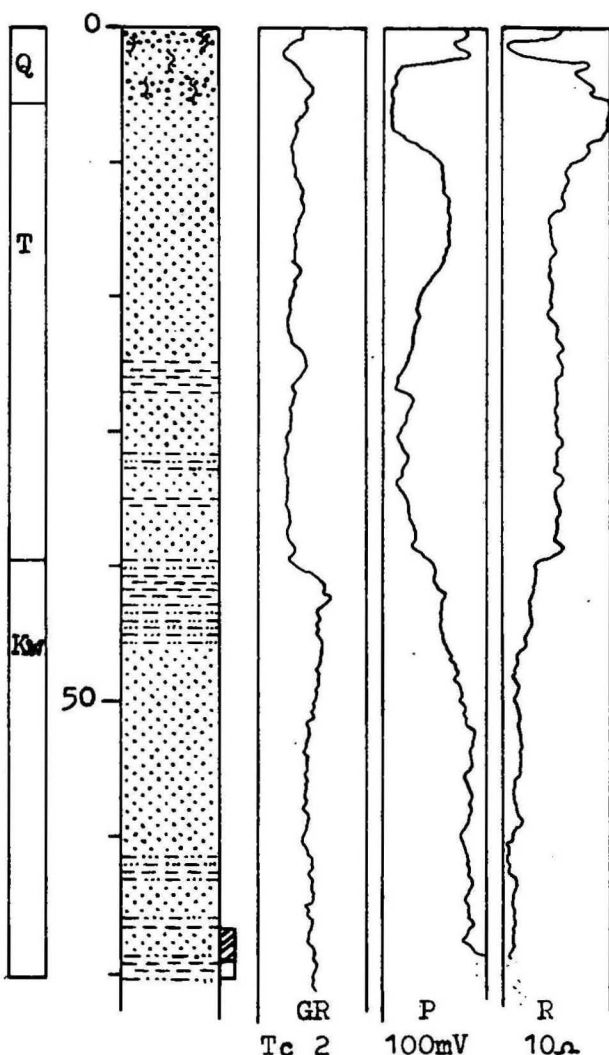
mostly pl gy Mdst, some Gypsum, non-calcareous.

BMR PANDIE PANDIE 1



(red)brn Sd&Gypcrete - (red)brn reworked Gypsum.
 as abv - lighter in colour,
 (yel)brn-olv, silicified Sltst or v f Sst.
 olv gy, silicified Sltst or v f Sst.
 altered and silicified Sltst&Sst.
 silicified Sst gradually changes into altered, fld Sst.

BMR PANDIE PANDIE 2



(red)brn, sandy Sl&Sd.
 v lt gy, (yel)wh silicified Sst; lt gn cl Sd; Gyp
 gy, olv gy, olv brn, lt (brn)gy, silicified, qzs Sst.
 lt gy, qzs Sst.
 lt gy, qzs Sst< gy Mdst.
 lt gy, qzs Sst.
 dk (yel)brn, qzs Sst&some lt gy Sst.
 lt gy, qzs Sst&Mdst.
 lt gy-wh, clayey, qzs Sst.
 purp-(red)gy Sltst&Mdst, some (yel)gy, lt gy alt Sltst
 mod gy Sltst.
 olv&(yel)orng, clayey, fe, labile Sst.
 as abv - m grnd, w srted Sst; some coal.
 as abv - quite fresh, c grnd, ang-subang Sst.
 mostly Sst, finer&clayey, also some Sltst&Mdst.
 Sst dominant, Mdst increasing - (yel)orng-lt gy
 CORE 1, recovery 70%. First 60 cm Sst grading
 into Sltst&Mdst. The rest is Mdst intbdd c
 Sltst&Sst. Colour is (yel)brn c gn tint. In
 places mod gy.