Open File Envelope No. 1884

SML 660

MOUNT DISTANCE

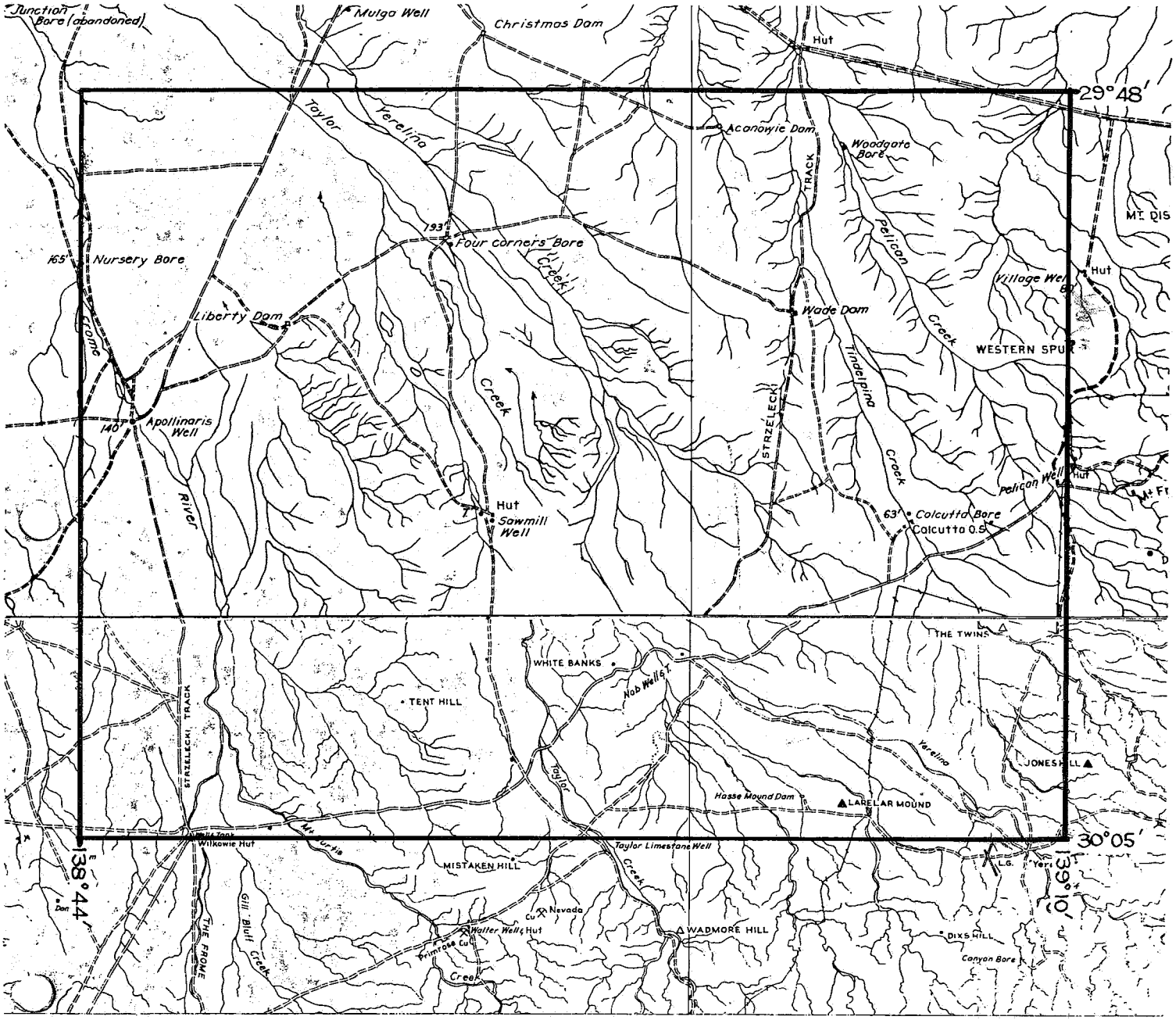
PROGRESS REPORTS TO LICENCE EXPIRY/RENEWAL FOR THE PERIOD 13/1/1972 TO 12/1/1973

Submitted by
Nissho-Iwai Co. (Australia) Pty Ltd
1973

Enquiries: Customer Services Branch
Minerals and Energy Resources
7th Floor
101 Grenfell Street, Adelaide 5000

Telephone: (08) 8463 3000
Facsimile: (08) 8204 1880

Government of South Australia
Primary Industries and Resources SA



SCALE 1:250 000

NISSHO - IWAI CO. (AUSTRALIA) PTY. LTD.

DOCKET DM 1259/71 AREA 504 SQ MILES

1:250000 PLANS . MARREE

· COPLEY

LOCALITY

S.M.L. No. 660 EXPIRY DATE 12.1.73

D.O
OV
FO
761
765

CONTENTS ENVELOPE 1884

TENEMENT: S.M.L. 660 Mt Distance

TENEMENT HOLDER: Nissho - Iwai Co (Aust) P/L

0003

First Quarterly Report

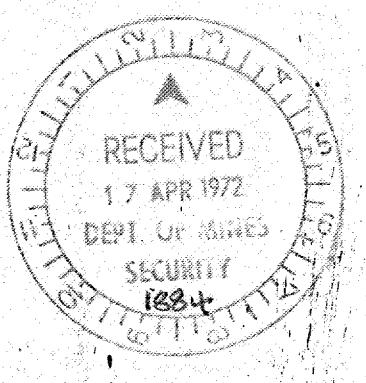
on

Special Mining Lease No. 660

in the Mount Distance Area

South Australia

April 13, 1972



Contents

0004

Illustrations

Introduction

Special Mining Lease No. 660 was secured in the Mount Distance area to investigate mainly to possibility of uranium mineralization which might be expected at similar geologic environments to that in the Lake Frome area. In the lease, favorable host rocks of carbonaceous material bearing sediments for uranium deposition are developed in the Tertiary Murnpeowie Formation and the upper part of the Cretaceous Marree Formation, and also present in the Jurassic Pelican Well Formation as well as the Trinity Well sandstone member. These are the objects of the exploration for sedimentary type uranium deposits.

Location and Accessibility

Special Mining Lease No. 660 covers an area of approximately 504 square miles situated about 40 miles east-south-east of Marree, 40 miles north-east of Leigh Creek, or 20 miles north-west of Mt. Painter and 350 miles north of Adelaide. This area has good accessibility by a main unsealded road from Port Augusta via Lyndhurst to Murnpeowie. The nearest railway station to the lease is Lyndhurst situated 30 miles to the west of the area, and the nearest airport having regular flight from Adelaide is Leigh Creek.

Tenure

Application for Special Mining Lease on the area was submitted to the Mines Department of South Australia on December 7, 1971 and SML 660 was granted for a period of twelve months

commencing January 13, 1972. The area is approximately 504 square miles, as outlined in the Figure 2 and described as follows:

Commencing at a point being the intersection of latitude 29°48' S and longitude 138°44' E, thence east to longitude 139°10' E, south to latitude 30°05' S, west to longitude 138°44', north to the point of commencement.

Physiography

The topography of the lease is a very flat stony desert being 450-500 feet above sea level. The average annual rainfall is approximately 5 inches and only saline water is available from bore and dams for grazing. The average temperature in January is 29°C and the average maximum temperature in the month is 38°C, while the average temperature in July is 12°C and the average minimum temperature in the month is 3°C.

Geology

The Flinders range of Pre-Cambrian age bifurcates at its northern end to make a V-shaped basin widening to the north. There are Jurassic, Cretaceous and Tertiary sediments in the V-shaped basin. Among these sediments, the Tertiary Murnpeowie Formation and the upper part of the Cretaceous Marree Formation are known to contain carbonaceous materials. A sedimentary uranium deposit has been confirmed to occur in the basal part of the Tertiary formation in the Lake Frome area which is situated in the eastern slope of the Flinders Range. It is assured that

the uranium deposit was formed by precipitation of uranium leached from ancient uranium deposit in the Mount Painter region. The Mount Distance area is located at the north-western side of the Flinders Range and the similar situation to the Lake Frome area.

Basement rocks in the Mount Distance area are composed of Proterozoic Adelaidian sedimentary rocks with minor mineralization of gold, silver, copper, lead and zinc. In the district of Leigh Creek and its neighborhood situated to the south of the lease, Upper Triassic terrestrial sediments are distributed at thickness of 2000 feet in four isolated small basins. There develop 3 layers of coal seam and the Leigh Creek coal mine has been operating to produce 1,500,000 tons of coal per year. The district north to Lyndhurst is situated in the southern end of a large Mesozoic basin called the Great Artesian Basin, and there are found a thick accumulation of Cretaceous sandstone and shale, and the Jurassic Village Well Formation exposed in some parts.

These Mesozoic formations are unconformably covered by the Tertiary Murnpeowie Formation of sandstone and conglomerate. Fossil plants of the Palaeogene have been reported from its outcrop distributed in a small area. The thickness of the covering Tertiary sediments is known to be 260 feet at Branckewater and 150-270 feet at Lake Eyre, but it is infered to be 10-40 feet in many places. The Tertiary formation have been turned out, in general, hard duricrust near the surface.

The stratigraphy in the area is summarized in the following table.

Table 1 Stratigraphic units in the Mount Distance area

Age	Formation	Rock
Quarternary		sand, gravel, soil
	Duricrust	silicified sedimentary rock
Tertiary	Murnpeowie Formation	sandstone, conglomerate, clay
Cretaceous	Blanchewater Formation Marree Formation Pelican Well Formation	sandstone, siltstone, shale, conglomerate
Jurassic	Village Well Formation	fine-grained sandstone, siltstone
Triassic	Leigh Creek coal seam Formation	coal, shale, siltstone
Proterozoic	Wilpena Group	quartzite, siltstone, slate, dolomite

Summary of Activities

Carborne radiometric survey and geochemical field investigation of natural water in the area of SML 660 and its neighborhood were carried out in December 1971 and March 1972.

Carborne Radiometric Survey

A carborne gamma radiometric survey was carried out about 970 linear miles in the area, where the Tertiary formation is distributed. No radioactive anomaly could be detected. All the measurements of radioactivity on the surface were below 10 μr/h. Only a Triassic carbonaceous shale near Leigh Creek showed week radioactive anomaly of 40 μr/h which was 6 times of background,

and after chemical analysis the shale contains only 0.004% of ThO_2 and no detective uranium. Model TCS-R12-805 scintillometer and Model TCS-112B scintillation survey meter, Japanese made equipments, were used in carborne radiometry and ground radiometric survey.

Geochemical survey of natural water

The surface radiometric survey seemed to be not so effective, because of the topographic flatness and characteristic geologic features of the area. So we have decided to give a priority to geochemical survey of ground water as the best method to detect the indication of uranium below the surface.

The localities where water samples were collected from are shown in the Figure 3. The analytical results of the samples in the lease and its neibourhood are shown in the following table.

Table 2 Summarized results of water sample assays

Sample No.	U_3O_8	Type	pH	Temperature	Water level	Depth of bore	Note
	ppb			°C	ft	ft	
33	0.21	Creek	5.2				muddy
34	10.0	Well	5.4		75		a little salty
35	14.0	Bore	6.3	20			soft
36	0.55	Well	6.0				impure
37	2.5	Well	6.2				
38	13.0	Bore	6.2				
39	0.25	Dam	5.5				salty, muddy
40	12.0	Bore	5.5				salty
41	8.0	Well	6.2		40		a little salty
42	8.0	Bore	6.3	15			a little salty
43	15.0	Spring	6.0				salty
44	15.0	Well	6.2	21	27	140	
45	0.40	Dam	6.2	13			soft
46	12.0	Bore	5.4	11		193	salty
47	0.55	Dam	5.3	18			
48	1.9	Well	6.2	22	130	154	salty, muddy
49	1.0	Dam	5.5	12			salty, muddy
50	0.05	Bore	6.9	44			soft
51	0.50	Bore	5.2	12			
52	0.09	Bore	5.5	13		721	salty
53	0.38	Dam	6.2	13			soft

Average uranium content in artesian water and ground water in the Great Artesian Basin was infered to be appropriate as background value in geochemical survey of water in the inland desert region. So the many samples were taken from the area of 400 miles by 500 miles, east to west and south to north respectively around the boundary between South Australia and Queensland. The following results were obtained; the average uranium contents of 17 samples from artesian flowing bores was 0.047 ppb (0.00 - 0.18 ppb) and that of 20 samples from hot water bores being more than 40°C was 0.052 ppb (0.00 - 0.15 ppb). Therefore, we adopted the average of these values, 0.05 ppb, as background value in the survey.

The uranium content of the samples tested in the area was confirmed to be 15 ppb at the maximum and 10 ppb or more in several places. The results can be regarded as indication of sedimentary uranium deposit as the samples were taken from bores drilled in the area where younger sediments were distributed.

Further water sampling programme will be intensively carried out in the next quarterly period.

Water samples were so treated as uranium be absorbed into ion-exchange resin at the field. The resin was then analyzed in the laboratory of the PNC in Japan.

Further Exploration Programme

The following exploration works have been planned as the second quarterly programme.

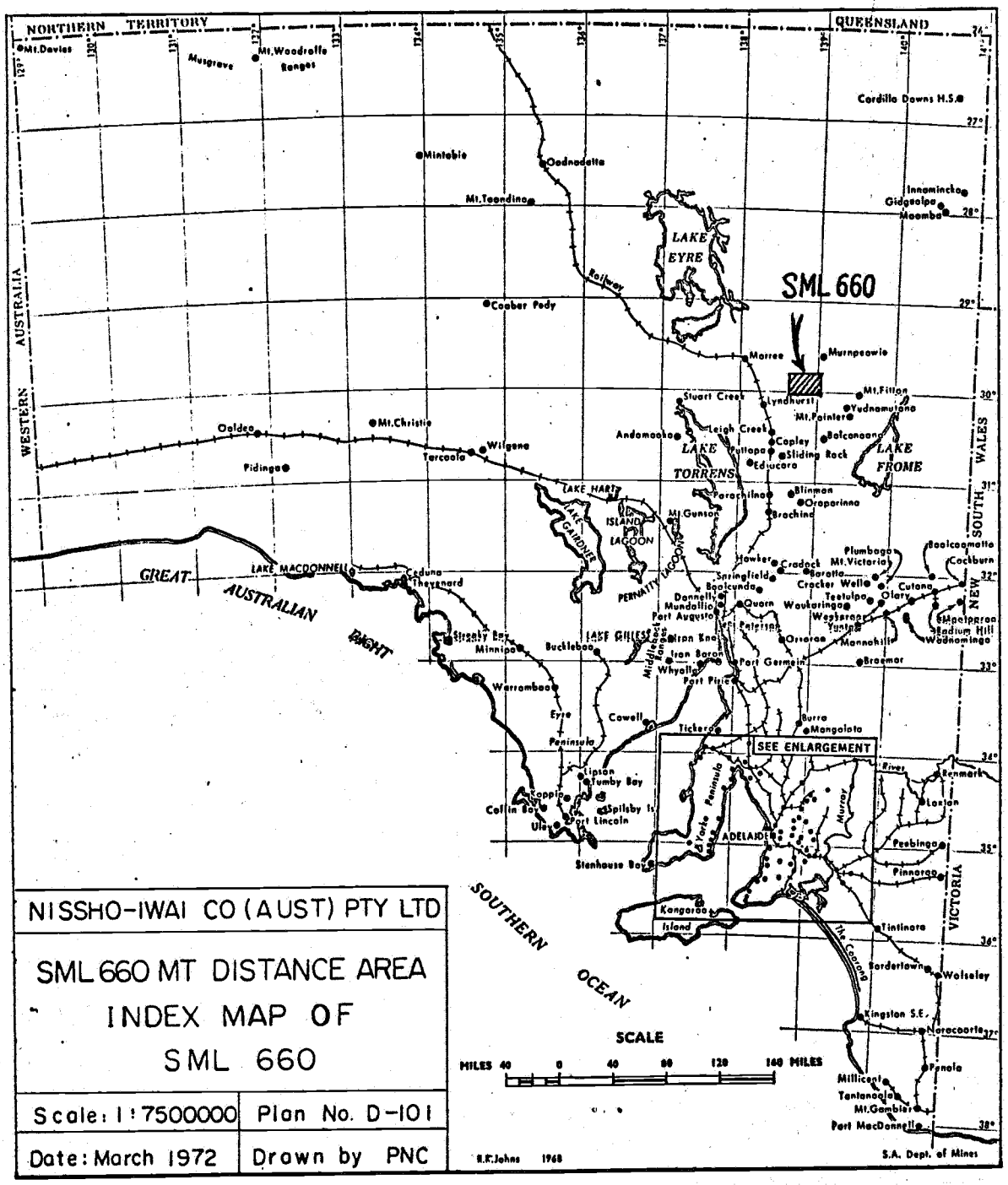
(1) Compilation and assessment of the available geological data on the lease.

(2) Further geochemical survey on natural water sample.

(3) Geologic investigations of existing wells or bore holes, and radiometric logging of them, if possible.

(4) Geological and geochemical survey on drainage system.

Some geophysical survey, if necessary, will be carried out in addition to the above-mentioned work. On the basis of the results, suitable places will be selected for scout drilling which will be followed in the third quarterly period.

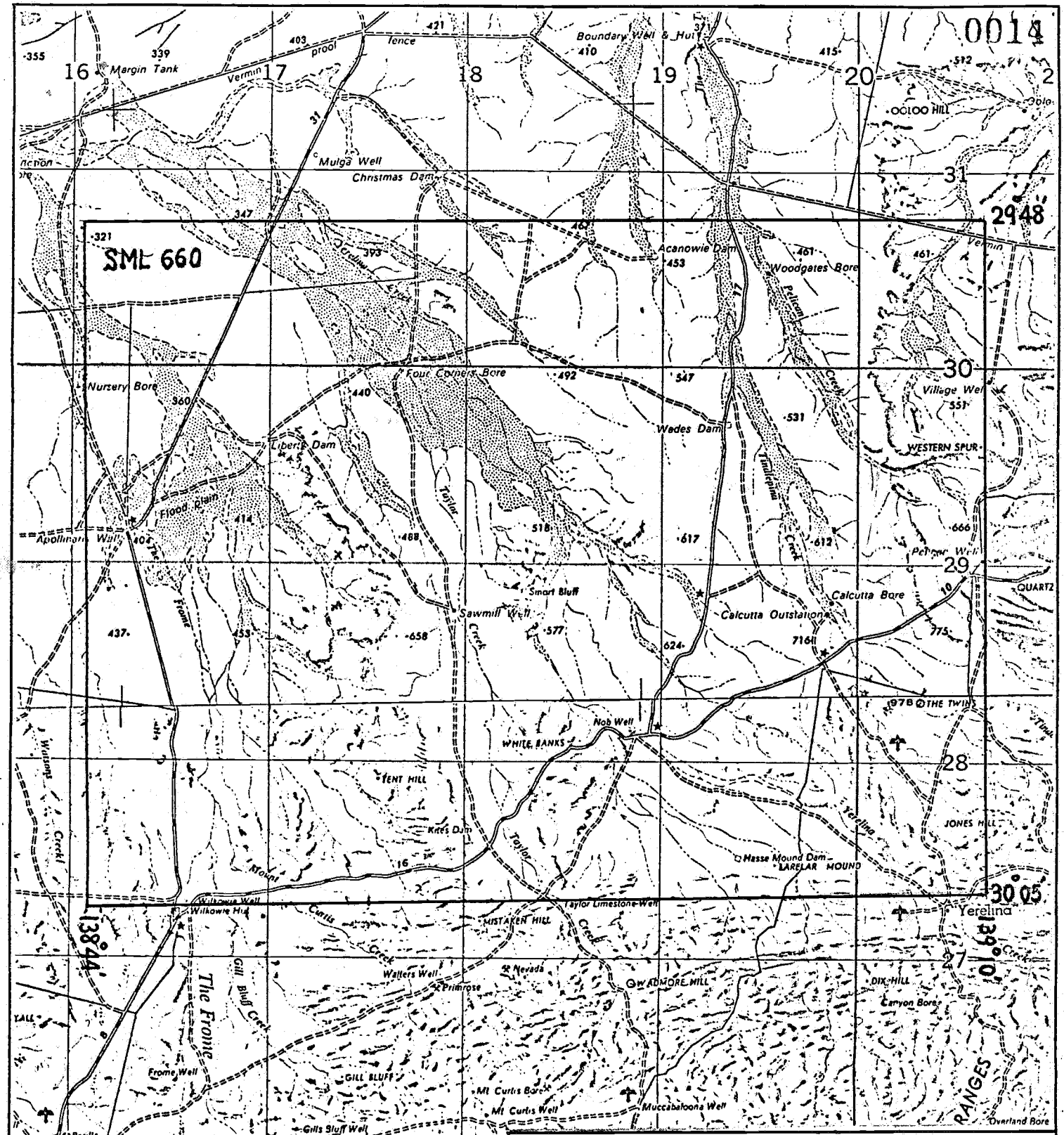


NISSHO-IWAI CO (AUST) PTY LTD

SML 660 MT DISTANCE AREA INDEX MAP OF SML 660

Scale: 1:7500000	Plan No. D-101
Date: March 1972	Drawn by PNC

FIG. 1

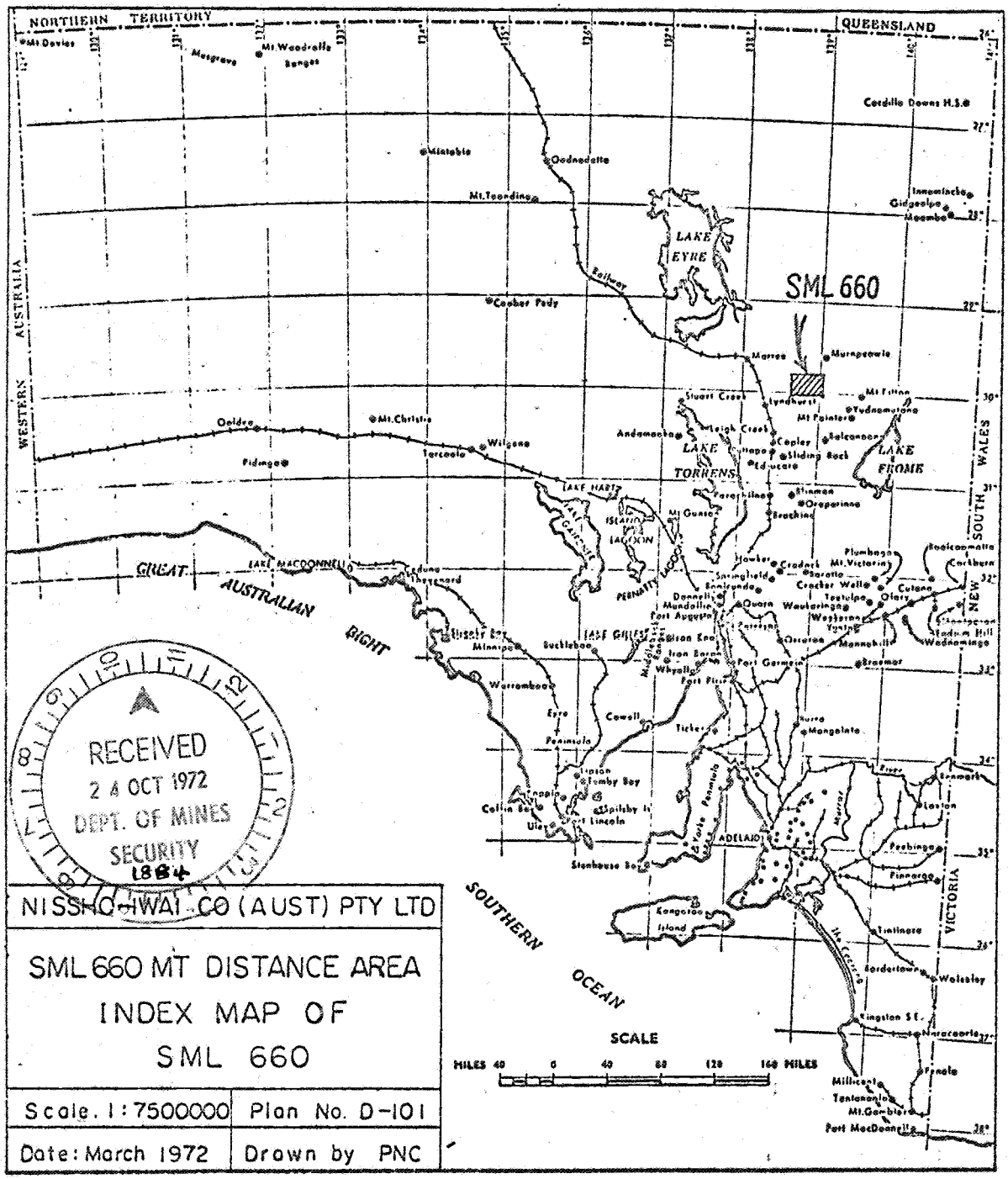


NISSHO-IWAI CO (AUST) PTY LTD

SML 660 MT DISTANCE AREA TOPOGRAHICAL MAP OF THE MT DISTANCE AREA

Scale : 1 : 250000	Plan No. D-001
Date : March 1972	Drawn by :

FIG. 2

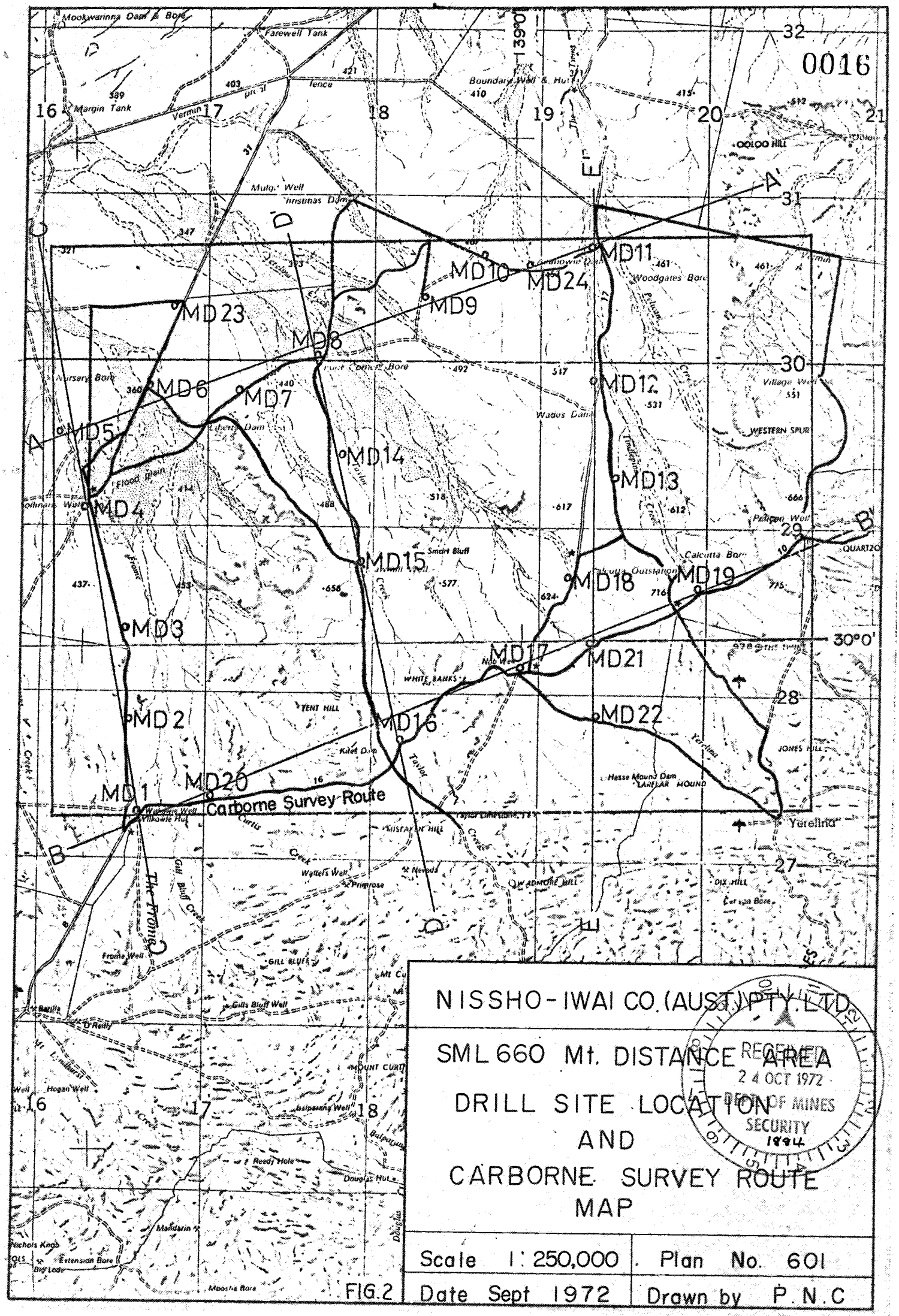


NISSHO-IWAI CO (AUST) PTY LTD

SML 660 MT DISTANCE AREA INDEX MAP OF SML 660

Scale. 1:7500000	Plan No. D-101
Date: March 1972	Drawn by PNC

FIG. 1



NISSHO-IWAI CO.(AUST)PTY.LTD.

SML 660 Mt. DISTANCE AREA

DRILL SITE LOCATION AND CARBORNE SURVEY ROUTE MAP

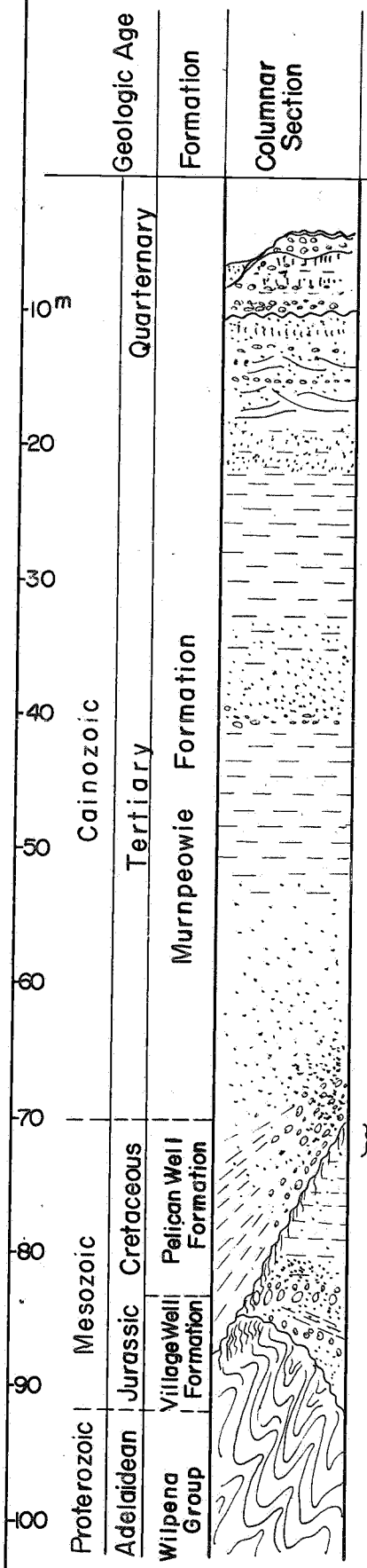
Scale 1:250,000	Plan No. 601
Date Sept 1972	Drawn by P.N.C

NISSHO-IWAI CO.(AUST)PTY.LTD

SML 660 Mt. DISTANCE AREA

GENERALIZED GEOLOGIC COLUMNAR SECTION

Scale = 1 : 500	Plan No. 602
Date: October 1972	Drawn by P.N.C



Remarks

high level gravel. conglomerate and gypsum sheets, gypseous clays and minor ferruginous sandstone

Silicified sediments (Silcrete) on the surface

cross laminated sandstone with thin pebble conglomerate beds

Radiometric anomaly observed in MD-9

Radiometric anomaly observed near Nobwell along Yerelina creek

pale ~ light grey mudstone

arkosic sandstone to conglomerate

Radiometric anomaly observed in MD-19. MD-4.

grey ~ dark grey mudstone

arkosic sandstone

Conglomerate to sandstone which may change lateraly to siltstone or mud stone in the northern and eastern part } Weathered zone

Sandstone, shale, and claystone, containing scattered boulders of basement rocks

pale grey fine sandstone, siltstone and claystone with local boulder bed

thin laminated blue-grey siltstone to phyllitic slate

FIG. 3

0018

Second Quarterly Report

on

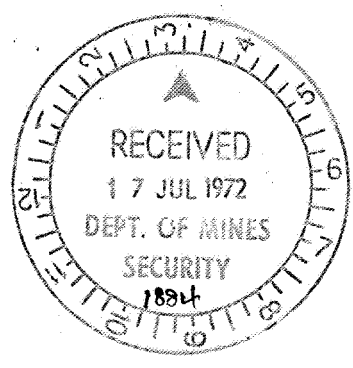
Special Mining Lease No. 660

in the Mount Distance Area

South Australia

NISSHO-IWAI CO. (AUSTRALIA) PTY. LTD.
499 BOURKE STREET,
MELBOURNE. VIC. 3000.

July 13, 1972



Contents

1. Summary of Exploration

The field works of this quarter were carried out by H. SHIBAYAMA, senior geologist of the P.N.C. and his assistant. These works included geochemical survey of ground water, radiometric logging in some wells and preliminary field examination for selecting the drill sites to get the indication of uranium mineralization at depths underground and to grasp geologic structure in this area.

Analysis of water samples collected from these wells is now underway at the P.N.C. laboratory. Radiometric logging was carried out in Wilkowie well, Apollinaris well, Calcutta well and Village well by using a gamma ray spectrometer "McPHar TV-5", but radiometric anomaly was not detected. It is one of the reasons why we could not find any anomaly that these wells are too shallow to get to basement rocks except Village well.

As the result of the field examination, it has been revealed that rotary drilling and percussion drilling are more available than diamond core drilling. According to the logging data of wells and bore holes by Department of Mines S.A., the depth to basement rocks is less than 100 ft at the most of wells in the southern half of this lease, and the depth is 700 ft or more at some of wells in north-western part of the lease, we estimate that maximum depth of drilling shall be 400 ft - 450 ft consulting the data of uranium ore deposits in Lake Frome area. In this area, there are ore deposits at the depth of 400 ft underground. With reference to these points, the site was set as shown in the attached figure. The drilling footage is

expected as much as 6800 ft in total. The drilling work will start in the coming August. We are now negotiating with some drilling companies to decide the contractor for this work.

In the way of the examination to select the drilling site, radiometric anomalies (45 μr/h, ~ 100 μr/h) were detected at the place of 3 miles east from Nob well. The detail will be reported in the next quarterly report.

0022

THIRD QUARTERY REPORT

ON

SPECIAL MINING LEASE NO. 660

MT. DISTANCE AREA

SOUTH AUSTRALIA

OCTOBER 13, 1972

NISSHO-IWAI CO. (AUSTRALIA) PTY. LTD.
499 BOURKE STREET,
MELBOURNE, VIC. 3000

CONTENTS

0023

Figures

I. INTRODUCTION

I-1 Summary of Exploration

The exploration works covering the SML No. 660 were carried out by P.N.C. exploration team conducted by senior geologist Dr. A. AIHARA and H. SHIBAYAMA from July 25 to August 19, 1972. Location of the lease is shown in the Fig. 1.

Uranium mineralization is expected within the Cainozoic sediments and the object of exploration works is concentrated on Tertiary and Quarternary sediments.

The origin of uranium mineralization might be situated within Flinders ranges and was leached and migrated to the younger sediments.

The works in this period mainly consisted of carborne radiometric survey together with surface geologic investigation, and drilling work was acompanied by radiometric logging.

Since the nature of the works was rather preliminary at the first period of field exploration, the route of the survey and sites were confined within accessible part by present main roads and trafficable tracks.

The surface radiometric survey was executed up to 200 miles over the lease area using truck mounted McPhar AV-4 spectrometer.

The drilling works was operated by Millicent (S.A.) based Thompson Drilling Co. Pty. Ltd. The drilling was done 5870 feet 24 hole within 15 days commencing July 10, 1972.

22 among 24 holes were radiometrically logged using McPhar TV-5 spectrometer, and rest of 2 holes were logged by TCS-603-RU Geiger-Müller counter made by J.R.C. in Japan.

Drill hole MD-14 was logged by both way for the purpose of correlation of total counts between them.

In 7 holes weak radioactive anomalies were detected more than three times of background.

I-2 General Geology

Most of the lease area is covered by the Cainozoic sediments except of eastern parts, and central southern parts where the Proterozoic Wilpena (Adelaidean) group expose as relatively rugged hills. Covering unconformably this Proterozoic sediments, Jurassic Village Wellformation and Pelican Well formation (Cretaceous) distribute at limited area of eastern margin of the lease. As above mentioned, Tertiary Murnpeowie formation distributes most of the lease area overlying Proterozoic and Mesozoic sediments and also underlying Quarternaly and Recent sediments. Murnpeowie formation consists of conglomerates, sandstone, mudstone silcrete and in someplace carbonates. These succession is summarized in the attached generalized columnar section. (Fig. 3)

II. Detailed exploration

II-1 Carborne radiometric and surface geologic survey

The carborne radiometric survey was carried out about 200 miles along the route using McPhar AV-4 spectrometer mounted on four wheel drive TOYOTA landcruiser. (See Fig. 2)

The spectrometer is thus provided to record simultaneously the energy levels of gamma radiation from Throium, Uranium, Potassium and total, and was operated under the following condition of ranges

and time constants,

1 Kc/min	3 sec	for Thorium
3 Kc/min	2 sec	Uranium
10 Kc/min	1 sec	Potassium
100 Kc/min	0.5 sec	Total

Except two weak radioactive anomalies at the eastern bank of Yerelina creek near Knob well and a point about 1 mile southeast from Village well, no radioactive anomaly was discovered. Since regional distribution of above mentioned weak anomalies were not explored precisely yet, the controlling factors of mineralization or origin of the anomalies have not been confirmed Radioactivity of principal rock facies are shown below.

Rock facies	Radioactivity (Kc/Min) McPar AV-4 total count
Silt or mud in flood plains	30 - 40
High level gravels	30 - 35
Sandstone	25 - 30
White claystone	25 - 30
Conglomerate	25 - 30
Limestone or Calcrete	20 - 25
Silcrete	20 - 25
Pre-Tertiary Slate, phyllite and conglomerate	30 - 35

The surface geologic exploration was accompanied by the carborne survey, and geologic investigation for remarkable outcrops close to the route and also radiometric anomalous spots detected by the carborne spectrometer were executed.

II-2 Stratigraphic logging

The stratigraphic logging was done combined with drilling work and surface geologic observation.

Since cuttings and slimes was collected from drill hole using 4-3/4" blade bits, the lithologic logging had to be done at each drill site simultaneously with drill operation.

It is necessary to observe not only cuttings and slimes but drilling condition such as rotation speed, penetration speed, sound etc. that have close relation with rock facies and hardness.

Results of logging is summarized in columnar sections and correlated along the lines shown in the Fig. 2.

On economical aspects, drilling depth were determined less than 600 feet. or after drilling basement rocks in 2-3 feet.

Because of lack of geological information, some of the holes were finished before meeting to the basement and also in some of the holes calcrete seam or boulder in black claystone is too hard for drilling to go down furthermore.

Since the uranium mineralization is expected within the Cainozoic sediments that overlie basement rocks.

The basement rocks consist of slate or phyllite in Wilpena Group and slate or siltstone, conglomerate, in the Mesozoic formations, both of which are highly weathered up to 100 feet from the unconformity with Cainozoic sediments.

The Tertiary Murnpeowie formation consists of pale blue to dark grey mudstone and creamy white sandstone to conglomerate, which are deposited with several cycles of sedimentation as shown in the correlated columnar sections.

Thickness of this formation is increased toward north.
Due to the drilling results and bore hole data obtained from Department of Mines, thickness of Tertiary formation on northern boundary of the lease are more than thousand feet.

As though there are no evidence whether these soft claystone and sandstone are Tertiary age or not, we have assumed of their hardness, rockfacies, and so on.

II-3 Radiometric logging

The radiometric logging was executed immediately after the drilling. Most of the holes were probed by McPhar TV-5 spectrometer using 1-1/4 x 1 inch sodium iodide crystal for TV-1 with 1000 feet armoured cable.
There were some troubles for open hole logging, as swelling clay and falling down of soft sand and pebble conglomerates.
Some holes had to be aboundoned to log in open hole by spectrometer probe. Instead of scintillation probe in open hole we used Geiger-Müller probe through the rod stem.
Size of G.M. tube are 20 cm in length and 1.8 cm in diameter.
The results of logging are summarized as following table, and grammalog are enclosed with litholog. (Fig. 4)

Hole No.	Drill length, Depth feet	Logged length, feet	Altitude* feet	Radioactivity C/M Max./B.G.
MD-1	116	111	540	9,400/2,500
2	115	150	490	8,300/3,000
3	185	176	450	6,800/3,000
4	200	191	410'	9,200/2,500
5	245	235	360	6,600/2,700
6	215	205.5	345	7,900/3,200
7	290	278	430	7,100/2,600
8	205	194	410	6,900/2,000
9	290	277	510	15,000/2,000
10	150	147	475	7,300/2,500
11	187	180	445	8,000/3,200
12	595	588	510	** 100/60
13	555	548	620	** 110/55
14	560	537	460	8,400/3,600
15	260	248	510	6,000/3,500
16	200	190	660	*** 720/300
17	140	134	620	*** 600/200
18	252	241	625	5,600/3,200
19	260	249	660	12,000/3,800
20	140	134	540	*** 560/200
21	125	119	640	7,000/2,600
22	85	79	690	7,000/3,600
23	275	261	690	7,800/2,500
24	185	175	460	8,300/2,700
Total	5,870	5,647.5		

* Altitude of each hole is not exact as it is measured tentatively by an aneroid altimeter.

** The count is measured by Geiger Müller tube through drill rod.

*** The count is measured by MC-Phar TV-5 operated by T_1 Range.

EXPLORATION EXPENDITURE

1.	Drilling Cost	10,800
	Road construction	
	Rotary percussion drilling	
2.	Logistics	1,900
	Transportation	
	Chartered 4 wheel drive vehicle	
	Postal and communication	
	Foods and fuels	
3.	Salaries and wages	1,970
4.	Depreciation	114
5.	Report cost	50
	Total	14,834

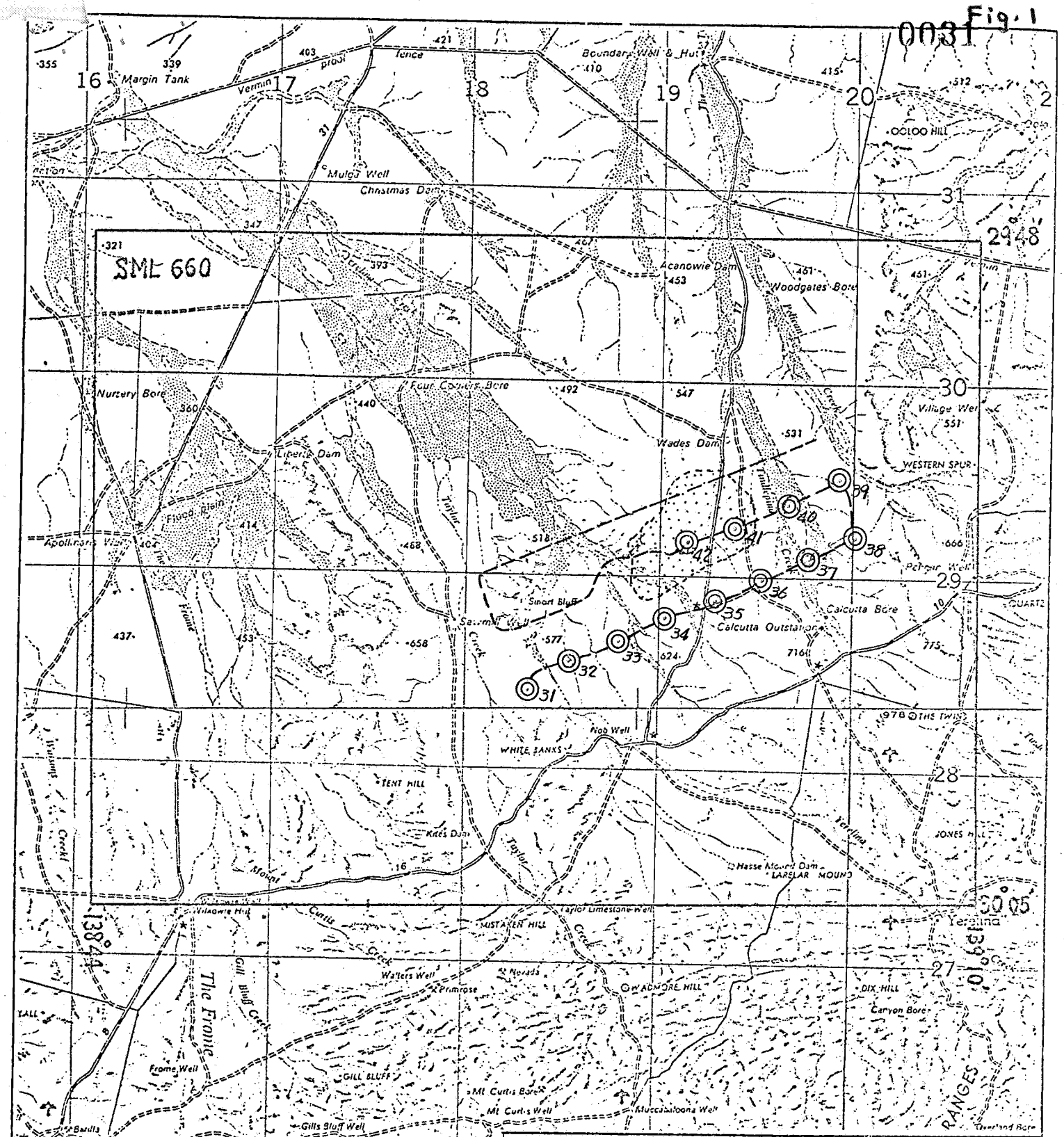
III. Further exploration programme

Field work in the next quarter will be consisted mainly rotary-percussion drilling over 5000 feet and supplementary carborne radiometric survey. Percussion drilling will be executed about 1 mile intervals along east-west lines which cross the creeks flown from Flinders ranges.

Carborne radiometric survey will be done along the fences and new tracks to proposed drillsites.

Fig. 1

0031



NISSHO-IWAI CO. (AUST.) PTY. LTD.

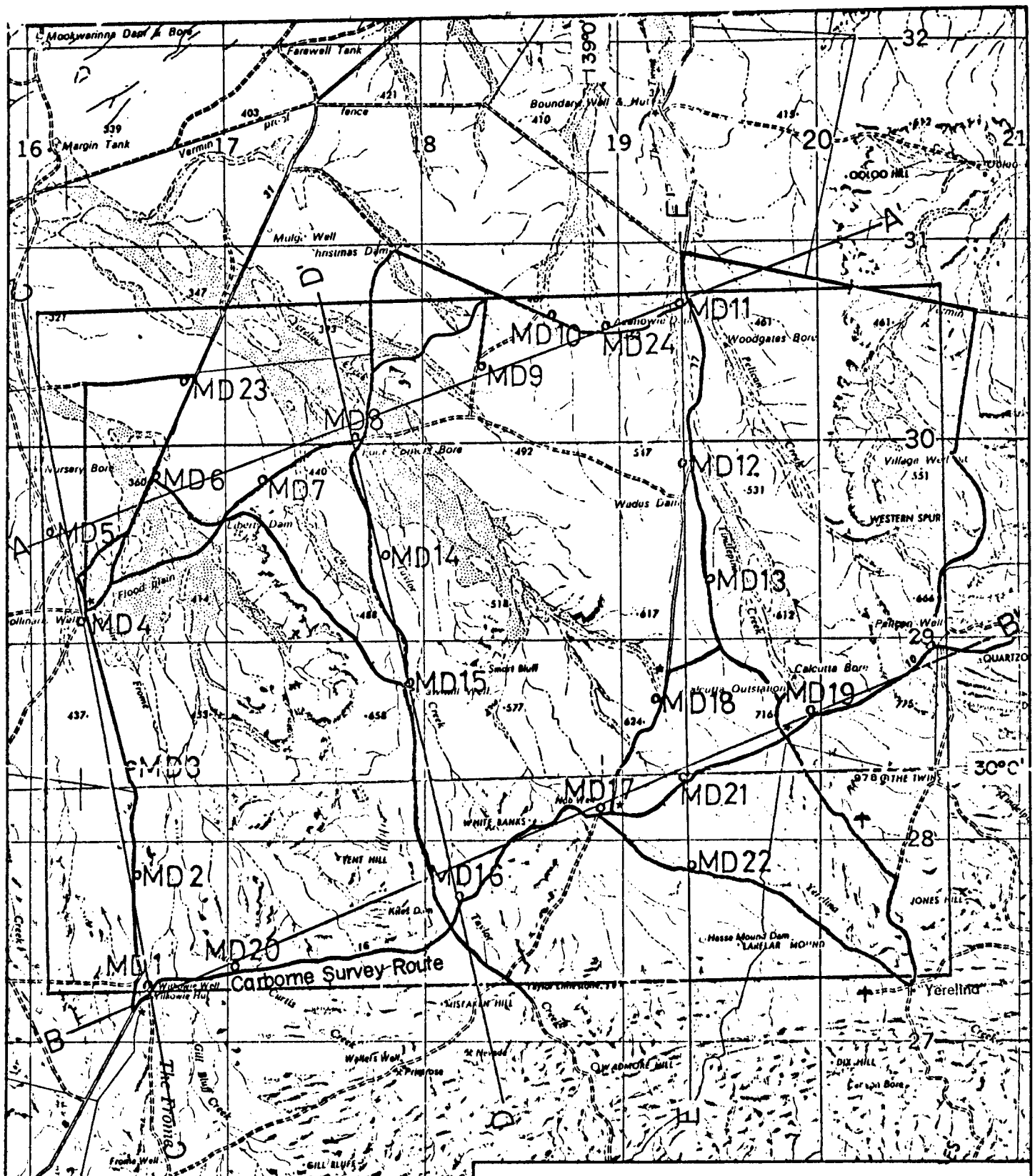
S.M.L. 660 Mr. DISTANCE AREA

LOCALITY MAP

OF

DRILL HOLES

Scale : 1 : 250,000	Plan No. D-610
Date JAN. 1973	Drawn by : P.N.C.



NISSHO-IWAI CO.(AUST.)PTY.LTD.

SML 660 Mt. DISTANCE AREA DRILL SITE LOCATION AND CARBORNE SURVEY ROUTE MAP

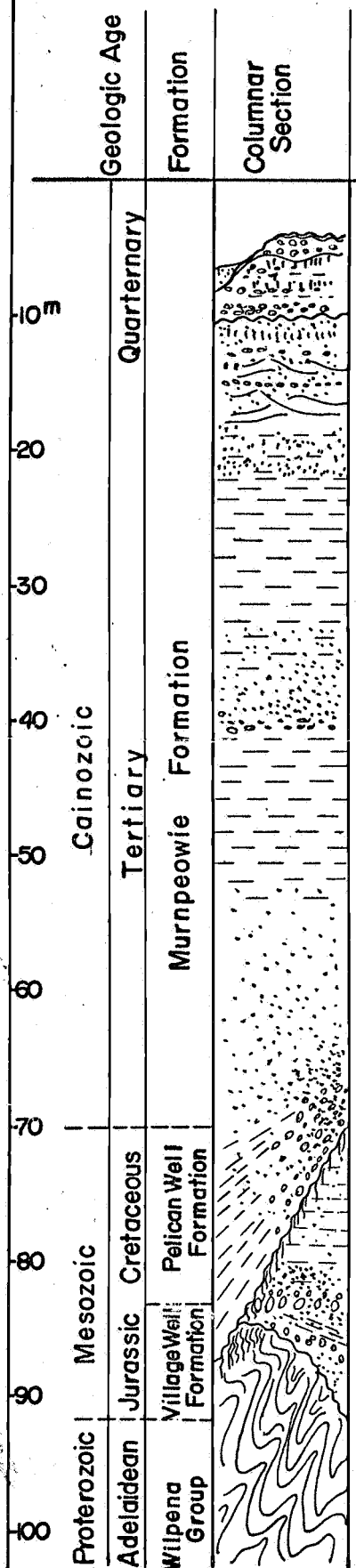
Scale 1:250,000	Plan No. 601
Date Sept 1972	Drawn by P.N.C

FIG.2

NISSHO-IWAI CO.(AUST)PTY.LTD

SML660 Mt. DISTANCE AREA
GENERALIZED GEOLOGIC
COLUMNAR SECTION

Scale = 1 : 500	Plan No. 602
Date: October 1972	Drawn by P.N.C



Remarks

high level gravel, conglomerate and gypsum sheets, gypseous clays and minor ferruginous sandstone

Silicified sediments (Silcrete) on the surface

cross laminated sandstone with thin pebble conglomerate beds

pale~light grey mudstone

arkosic sandstone to conglomerate

grey ~ dark grey mudstone

arkosic sandstone

Conglomerate to sandstone which may change lateraly to siltstone or mudstone in the northern and eastern part } Weathered zone

Sandstone, shale, and claystone, containing scattered boulders of basement rocks

pale grey fine sandstone, siltstone and claystone with local boulder bed

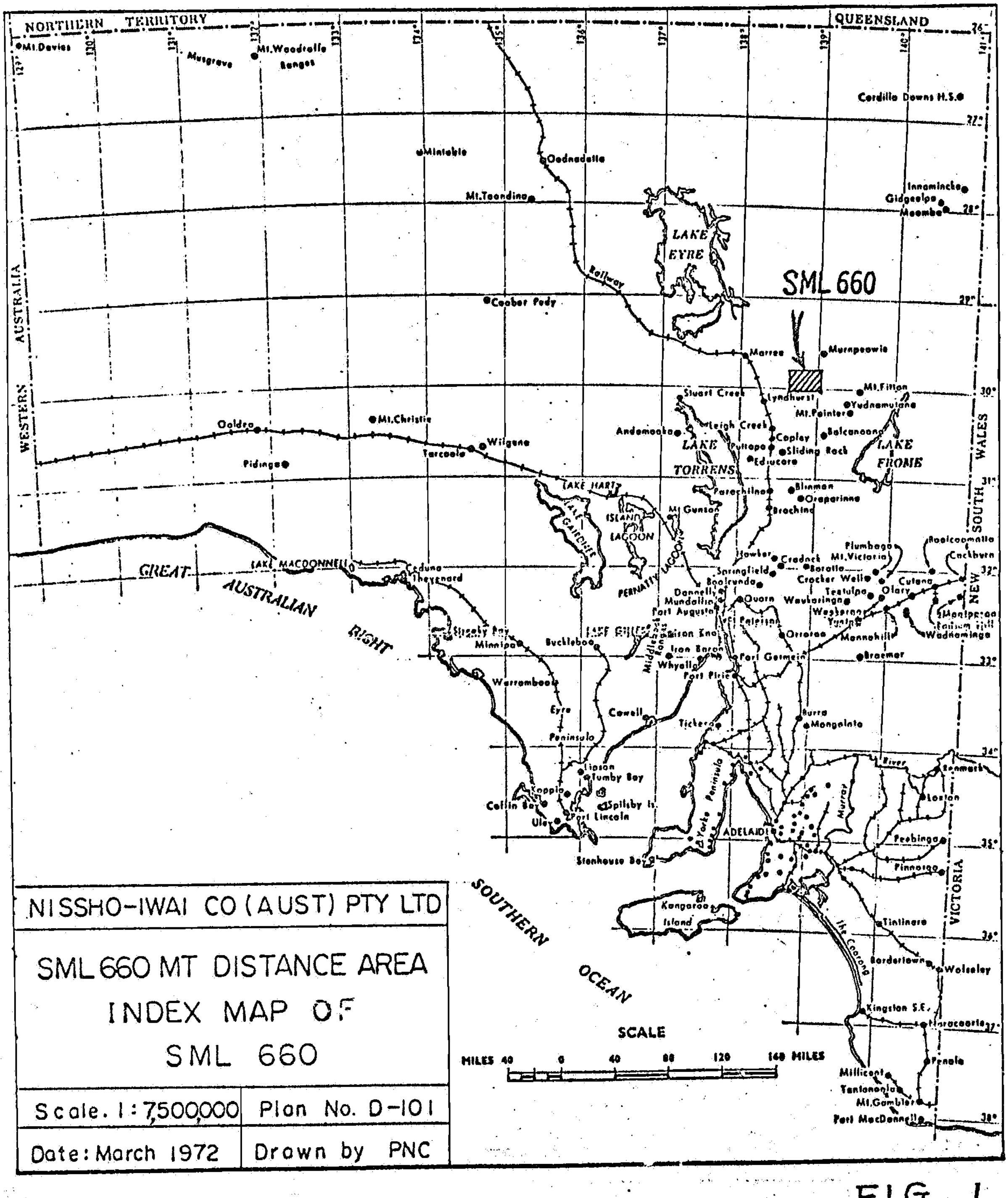
thin laminated blue-grey siltstone to phyllitic slate

Radiometric anomaly observed in MD-9

Radiometric anomaly observed near Nobwell along Yarelina Creek

Radiometric anomaly observed in MD-19, MD-4.

FIG. 3



NISSHO-IWAI CO (AUST) PTY LTD

SML 660 MT DISTANCE AREA
INDEX MAP OF
SML 660

Scale. 1:7,500,000	Plan No. D-101
Date: March 1972	Drawn by PNC

FIG. 1

FOURTH QUARTERY REPORT

ON

SPECIAL MINING LEASE NO. 660

MT. DISTANCE AREA

SOUTH AUSTRALIA

JANUARY 13, 1973

NISSHO-IWAI CO. (AUSTRALIA) PTY. LTD.
570 BOURKE STREET
MELBOURNE, 3000.

CONTENTS

Figures

1. Summary of Exploration

Subsequent to the geological survey during the third quarter, the drilling exploration work was conducted by Messers. Hirakawa and Fujimoto, PNC personnel, in the eastern half section of SML No. 660 from December 1. to December 23, 1972. (see Fig. 1)

Although the possible uranium mineralization in this area has already been noted in the previous Quarterly Reports, the current drilling exploration was collectively made in reduced area, in particular in the eastern half section of SML No. 660 according to the following reasons :

(1) The possible deposition of leachable uranium may have originated from Flinders Ranges into younger sediments in this area because of radioactive anomaly observed near by the Nob Well;

(2) The probable presence of a concaved structure at the basement surface, that is the formation of channel structure, between both creeks, Taylor and Pelican, according to the result of drillings made during the third quarter;

The highest level limit for unoxidized zone in this area estimated at about 550 feet above the sea level, depending on the consideration that the deposit have to be prospected that might be occurred in the unoxidized zone.

The distance between drilling holes was set to be some 2.5 Km considering the magnitude of the deposit.

The field work was started after the construction of a new road linking each of drilling sites (some 60 Km by a bulldozer), and the drilling operation was conducted by Thompson Drilling Co. Pty. Ltd. as before.

A total operation of drilling done was 16 holes with 6,165 feet and radiometric logging was carried out 5 out of 16 holes by a spectrometer, Mcphar TV-5, and the remaining 11 holes by a GM counter, TCS-603 RU. And along with radiometric logging, resistivity of rocks was also measured by a electric logging equipment Y.E.W. 3244. As a result, weak anomaly (BGx4) was observed at 4 out of 16 holes.

2. Stratigraphic Logging

Because of drilling with a blade bit of $4\frac{3}{4}''$ for soft sediments and with a tricone bit or hammer drilling for relatively hard sediments in the current drilling, as in the previous one. Geological situation was estimated at quite the same way as before on the basis of observation of cuttings and slimes.

Due to the results of electric logging, it could be recognized the rock facies by resistivity of rocks, even when not known fully by observation of cuttings and others.

Resistivity of fine grained rocks, such as siltstone, shale in younger sediments generally show low resistivity, on the other hand, coarse sediments in younger formation, hard silcrete, hard slate and schist show high resistivity.

Electric logging in this area was recognized to be very useful, although it could not be carried out at some of holes due to unsatisfactory hole condition.

For fully performance of electric logging, it is necessary to maintain good hole condition, especially careful control of drilling fluid such as that of exploration drilling of petroleum.

While the previous drilling had been made in the extensive range limited covering the whole area of SML No. 660, currently a rather minute survey was conducted in limited area, the geological condition between Taylor and Pelican creeks being considerably made clear.

Basement rocks adjacent to Taylor creek consist of proterozoic slate and phyllitic quartzite and composing a rather highland paleotopographically. However, as to the east, the basement are not recognized fully because of being covered by Mesozoic formation (which consists of, in general, alternation of light blue hard shale and sand stone, showing partly weathered zone extending about 100 feet), and seem to form a possibly broad embayment structure.

The Tertiary formation is consisting such constituents as dark grey sandstone with pebble conglomerate, alternation of sandstone and mudstone, and mudstone in ascending order with a total thickness of 100 - 450 feet. It has a tendency to increase the thickness towards north.

The Tertiary formation is nearly horizontal and is almost homogeneous in lateral facies, except slight change from mudstone to fine sandstone to eastward in the upper part of formation.

As it is clearly seen from Fig. 2 and 3, we can not expect large channel structure of unconformity between the Mesozoic and Tertiary formations.

The Quaternary sediments develop almost along the present water system, covering Tertiary formation discordantly and they are changing in rock facies, consisting of conglomerate, quartzite sandstone and siltstone in ascending order (with total thickness of 50-150 feet). There are silcrete formed lense-like in the siltstone and a white clay formation has been observed partly, which is a product of alternation.

3. Radiometric Logging

While in the previous drilling a spectrometer, Mcphar TV-5, was used for measurement on the most of holes, this time taking into account of troubles which may often readily arise on open hole logging, most of measurements were done by GM probe passing through a drilling stem.

Results of logging are as shown in the following table. (see Figs. 2 and 3)

DRILLING RESULTS

December 1972

Hole No.	Drill length Depth feet	Logged length feet	Altitude feet	Radioactivity C/M Max./B.G
MD-31	235	225	548	9,500/3,000 TO
32	270	252	525	7,500/3,000 TO
33	285	280	540	7,200/3,000 TO
34	430	425	576	7,600/3,500 TO
35	435	420	671	10,000/3,000 TO
36	510	500	671	200/100 GM
37	475	462	672	140/50 GM
38	420	410	623	160/40 GM
39	600	577	705	180/50 GM
40	535	518	623	185/60 GM
41	500	492	605	210/50 GM
42	465	459	656	200/50 GM
43	450	449	623	160/60 GM
44	260	252	590	105/50 GM
45	155	151	574	150/50 GM
46	140	134	590	130/60 GM
Total	6,165	6,006		

4. Electric Logging

As the first trial in the area of SML No. 660, a measurement was made by a electric logging equipment, Y.E.W. 3244, on resistivity of rocks at 1 m interval at the open hole after completion of the radiometric logging. Because of its dependence on the hole conditions and drop of water level, this resulted in only the partly execution conducted, while most of measurements were feasible. Results of logging are as shown in Figs. 2 and 3.

5. Further Exploration Program

The drilling results during the fourth quarter were nothing but several holes with weak radioactive anomaly to be observed and the initial expectation was not achieved. However, considering

(1) that, being a weak anomaly though, radioactivity of four times larger than Background was observed in granule conglomerate immediately above the unconformity plane on the base of Mesozoic formation similar to Lake Frome type, and

(2) that four holes of MD-35, 36, 41 and 42 supposed to be weak anomaly are forming a weak anomalous area running to the direction of NNW, including MD-19 with radioactivity of the same strength observed in the previous survey,

The drilling of some 5,000 feet is to be conducted in the renewed area of SML No. 660, with a view to

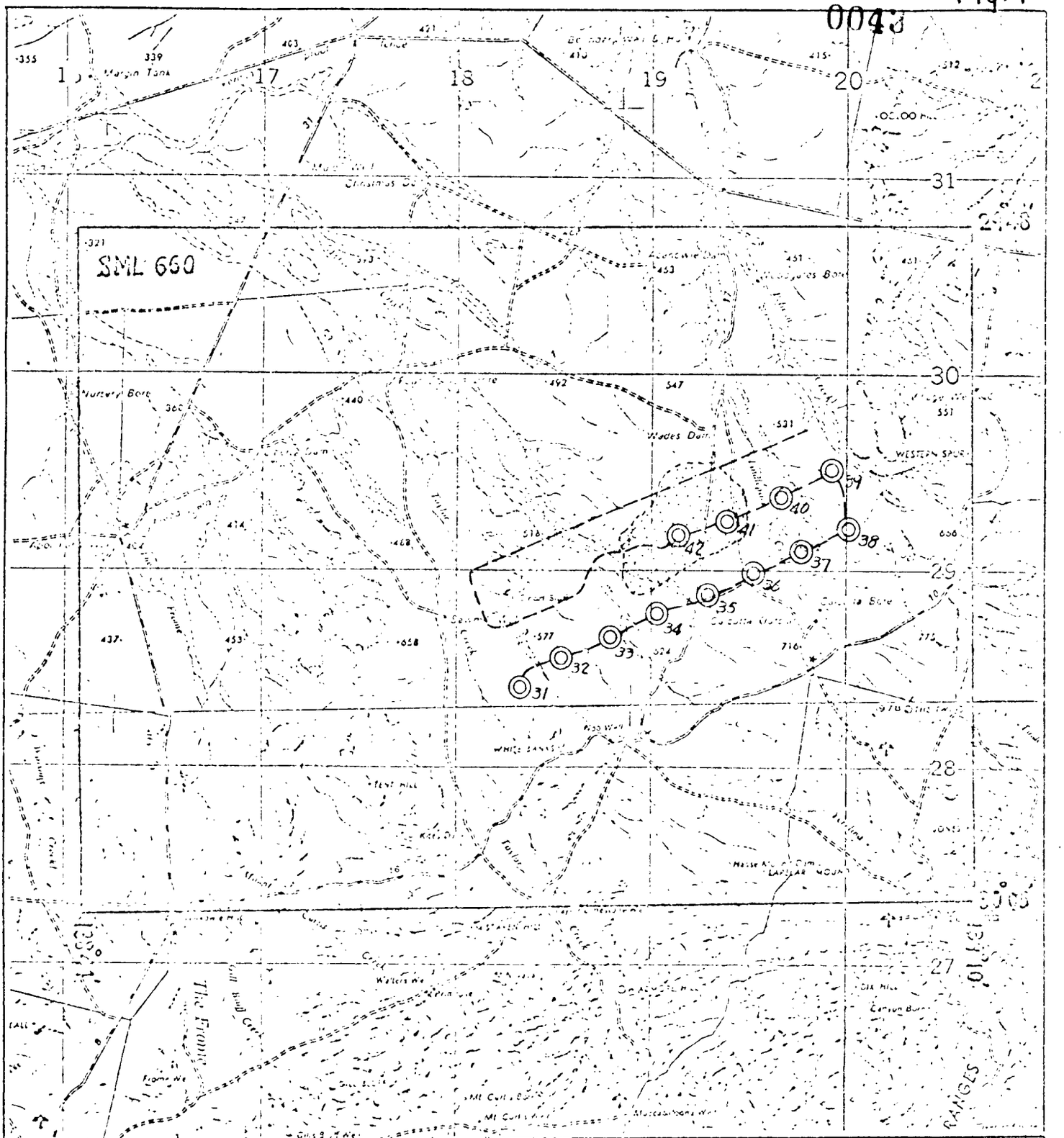
(1) that the drilling continues to be made westward along the 40-line at 2.5 Km interval, and

(2) that, in order to follow on the further north of the said weak anomalcus zone, the drilling is to be made at a narrow interval of some

1.25 Km so as to detect the presence of certain formation and channel structure favorable to deposition.

Fig. 1

0043



NISSHO-IWAI CO. (AUST.) PTY. LTD.

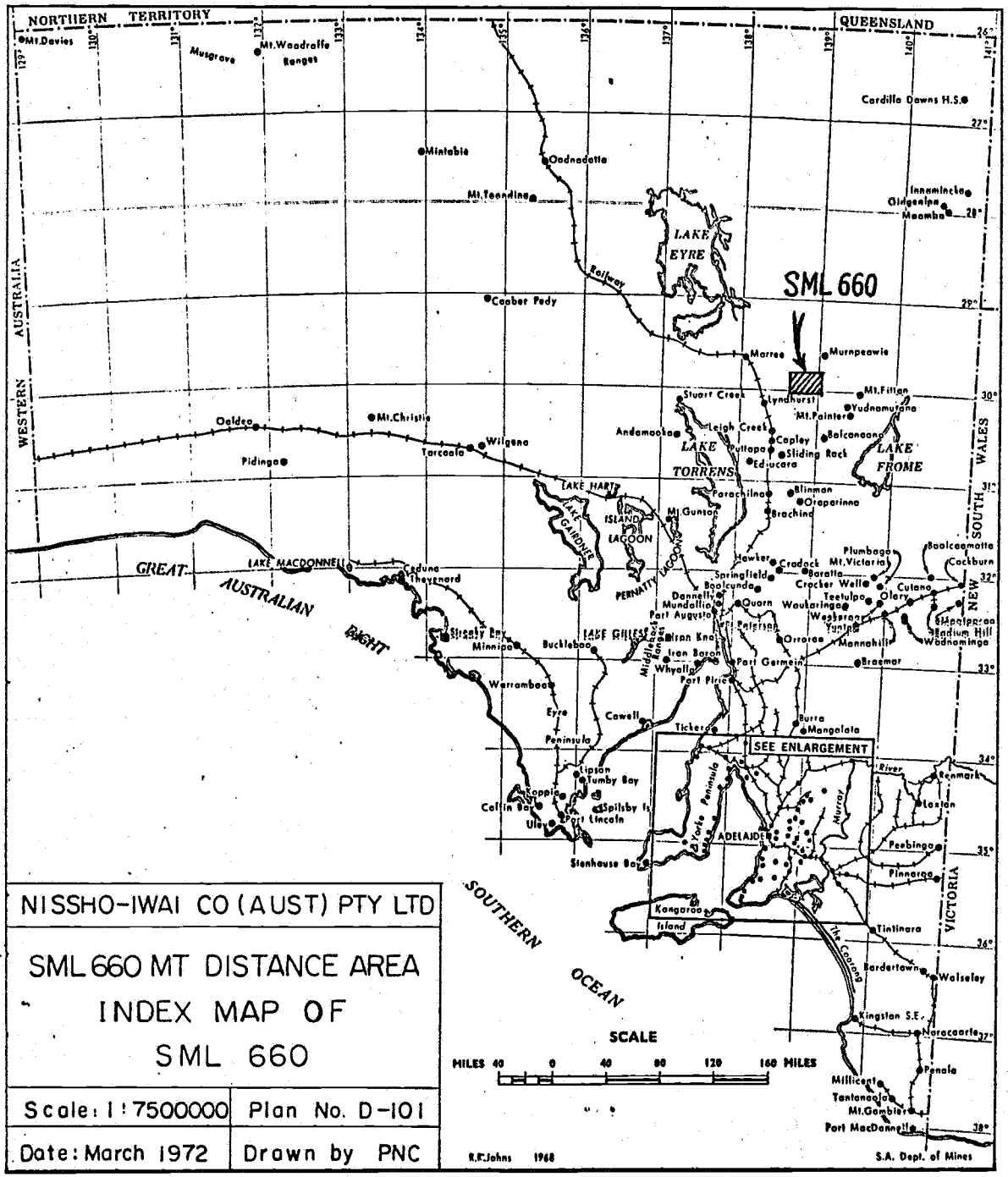
S.M.L. 660 MT. DISTANCE AREA

LOCALITY MAP

OF

DRILL HOLES

Scale : 1 : 250,000	Plan No. D-610
Date JAN. 1973	Drawn by : P.N.C.



NISSHO-IWAI CO (AUST) PTY LTD	
SML 660 MT DISTANCE AREA INDEX MAP OF SML 660	
Scale: 1:7500000	Plan No. D-101
Date: March 1972	Drawn by PNC

FIG. 1

NISSHO-IWAI CO.(AUST.) PTY. LTD.

SML.660 MT. DISTANCE AREA

MAP SHOWING

DRILLING SITE

ENV 1884-1

Scale : 1 : 250000	Plan No. D - 601
Date : June 1972	Drawn by PNC

LEGEND

Water sample :

33 Sample number

□ Well

◇ bore

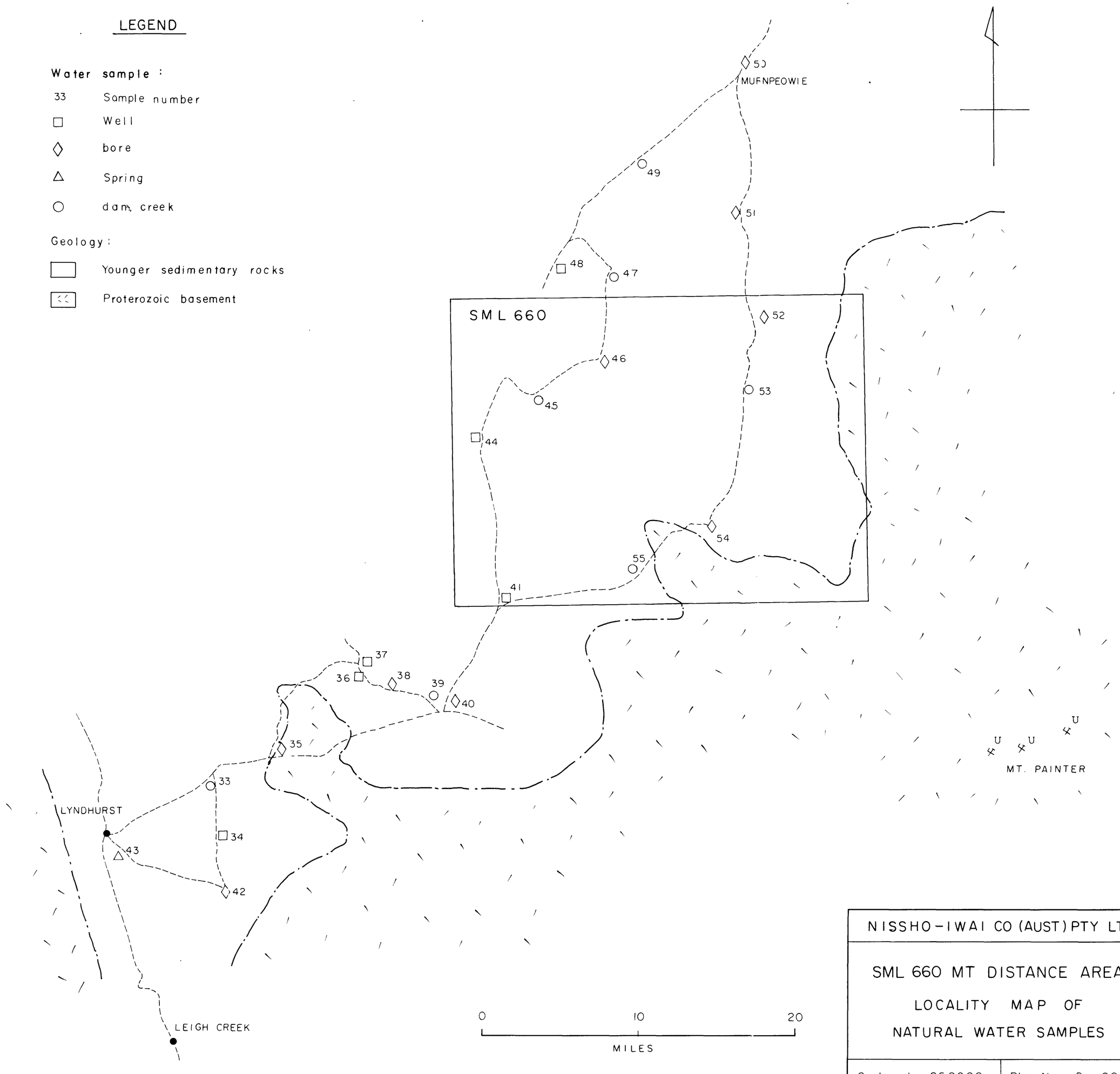
△ Spring

○ dam, creek

Geology :

▭ Younger sedimentary rocks

▭ Proterozoic basement



NISSHO-IWAI CO (AUST) PTY LTD	
SML 660 MT DISTANCE AREA LOCALITY MAP OF NATURAL WATER SAMPLES	
Scale : 1 : 250000	Plan No. D – 201
Date : March 1972	Drawn by PNC

FIG. 3

ENV 1884-2

ft

700

600

500

400

300

200

100

0

M D 31

G. L. 548 ft

T. D. 235 ft

B G. 3.0 KC/M (To)

0 10 20 Ω-m 20 KC/M (To)

M D 32

G. L. 525 ft

T. D. 270 ft

B G 3.0 KC/M (To)

0 10 20 Ω-m 20 KC/M (To)

25 ft

M D 33

G. L. 540 ft

T. D. 285 ft

B G 3.0 KC/M (To)

0 10 20 Ω-m 20 KC/M (To)

45 ft

M D 34

G. L. 576 ft

T. D. 430 ft

B G. 3.5 KC/M (To)

0 10 20 Ω-m 10 20 KC/M (To)

105 ft

M D 35

G. L. 671 ft

T. D. 435 ft

B G 3.0 KC/M (To)

0 10 20 Ω-m 10 20 KC/M (To)

200 ft

M D 36

G. L. 671 ft

T. D. 510 ft

B G 100 c/m

0 100 10 200 300 20 Ω-m 400 cpm

M D 37

G. L. 672 ft

T. D. 475 ft

B G 50 c/m

0 100 10 200 300 20 Ω-m 400 cpm

M D 38

G. L. 623 ft

T. D. 420 ft

B G 40 c/m

0 100 10 200 300 20 Ω-m 400 cpm

ft Above sea Level

700

600

500

400

300

200

100

0

LEGEND

MD 42	Number of drill hole
G. L.	Ground level
T. D.	Drilling depth
B G.	Back gronnd on radio activity
Ω-m	Resistivity
cpm	Count per minute measured by T.C.S 603 RU
KC/M (To)	Kilo counts per minute measured by Mcphar TV-5
...	Resistivity
——	Radioactivity

AGE

Quaternary	recent	Overburder
		Silcrete
		Siliceous Sandstone Siltstone
Tertiary		Mud stone
		Sand stone
		Conglomerate
Mesozoic		Shale, Sandstone
Proterozoic		Slate, quartzite

RECEIVED DEPT. OF MINES SECURITY

NISSHO — IWAI CO. (AUST.) PTY. LTD.

SML 660 MT. DISTANCE AREA
COLUMNAR SECTION OF DRILL HOLES
WITH
RADIOMETRIC & ELECTRIC LOGGING RESULTS

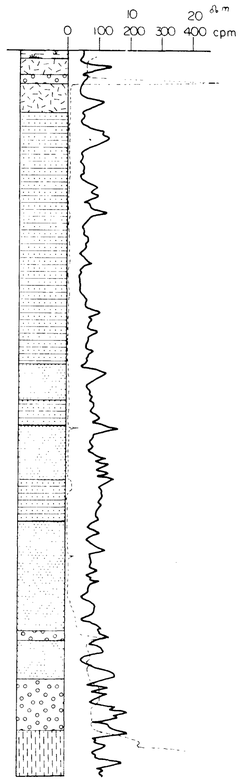
Plan No. D — 608

Date : Jan 1973 | Drawn by : P.N.C

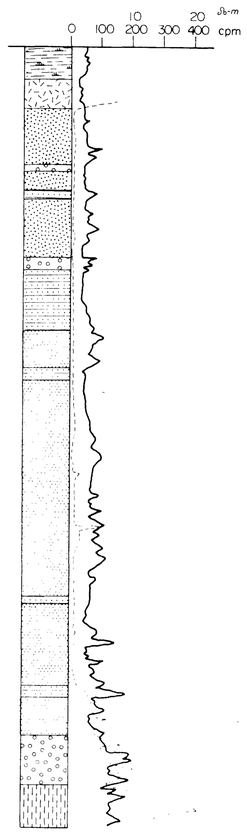
ENV 1884-3

FIG. 2

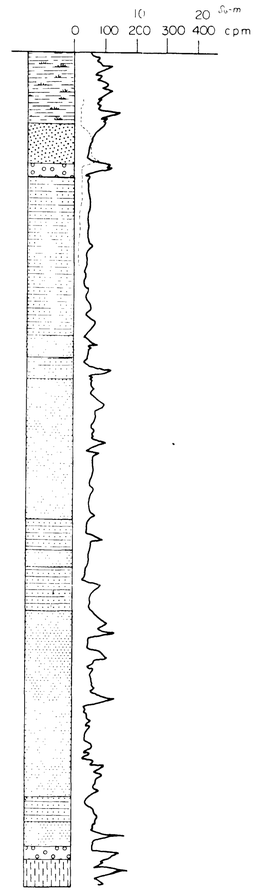
MD 42
G.L. 656 ft
T.D. 465 ft
B G. 50 c/m



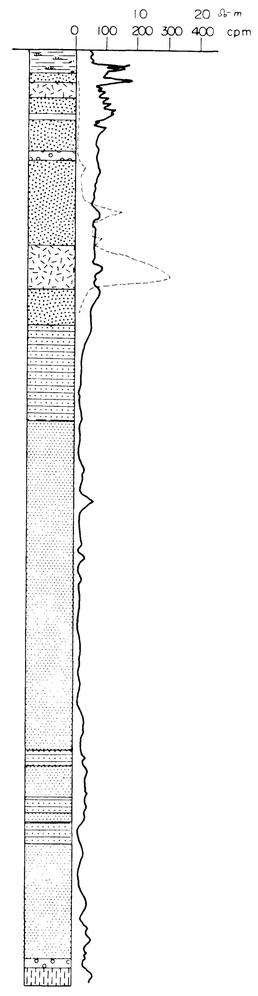
MD 41
G.L. 605 ft
T.D. 500 ft
B G. 50 c/m



MD 40
G.L. 623 ft
T.D. 535 ft
B G. 60 c/m



MD 39
G.L. 705 ft
T.D. 600 ft
B G. 50 c/m



MD 42	Number of drill hole
G. L.	Ground level
T. D.	Drilling depth
B G.	Back gronnd on radio activity
Ω-m	Resistivity
cpm	Count per minute measured by T.C.S 603 RU
KC/M (To)	Kilo counts per minute measured by Mcphar TV-5
.....	Resistivity
———	Radioactivity

LEGEND

AGE		
Quaternary	recent	Overburden
		Silcrete
		Siliceous Sandstone Siltstone
Tertiary		Mud stone
		Sand stone
		Conglomerate
Mesozoic		Shale, Sandstone
Proterozoic		Slate, quartzite

NISSHO – IWAI CO (AUST) PTY LTD

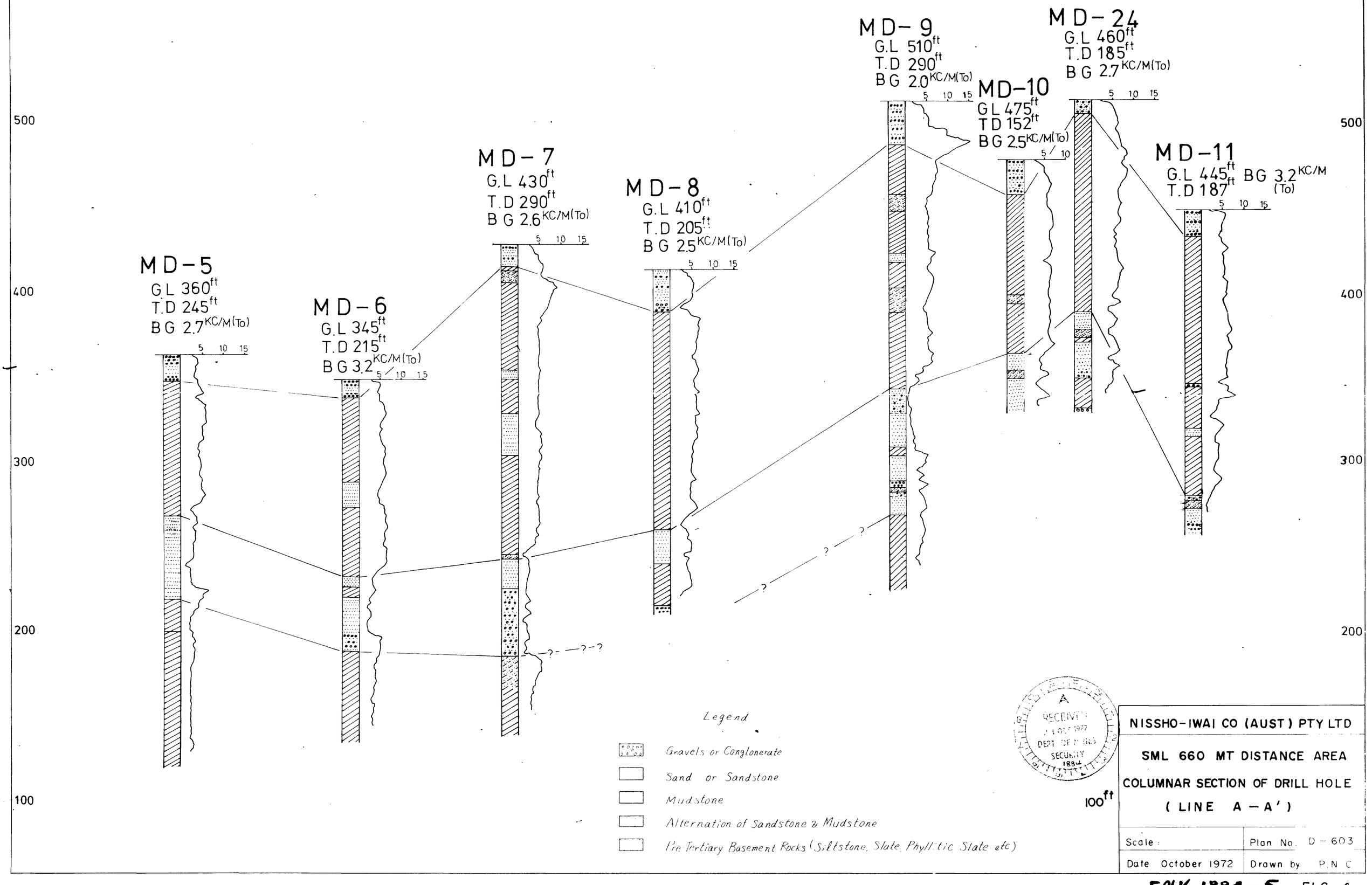
SML 660 MT. DISTANCE AREA
COLUMNAR SECTION OF DRILL HOLES
WITH
RADIOMETRIC & ELECTRIC LOGGING RESULTS

Plan No. D – 609

Date : Jan 1973 Drawn by : P. N.C

ENV 1884-9

FIG. 3



NISSHO-IWAI CO (AUST) PTY LTD

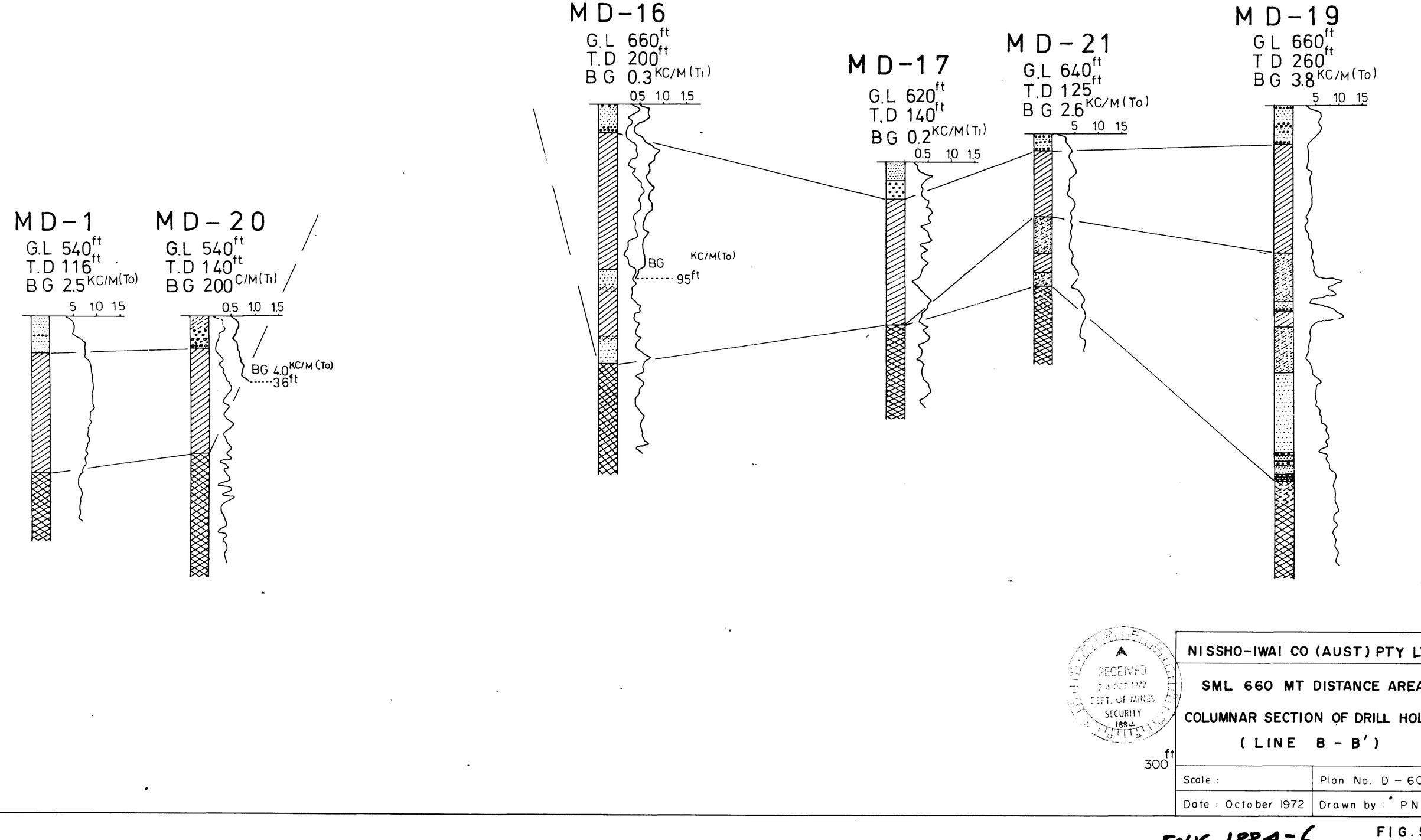
SML 660 MT DISTANCE AREA

COLUMNAR SECTION OF DRILL HOLE

(LINE A – A')

Scale :	Plan No. D – 603
Date October 1972	Drawn by P.N.C

ENV 1884–5 FIG. 4



NISSHO-IWAI CO (AUST) PTY LTD

SML 660 MT DISTANCE AREA

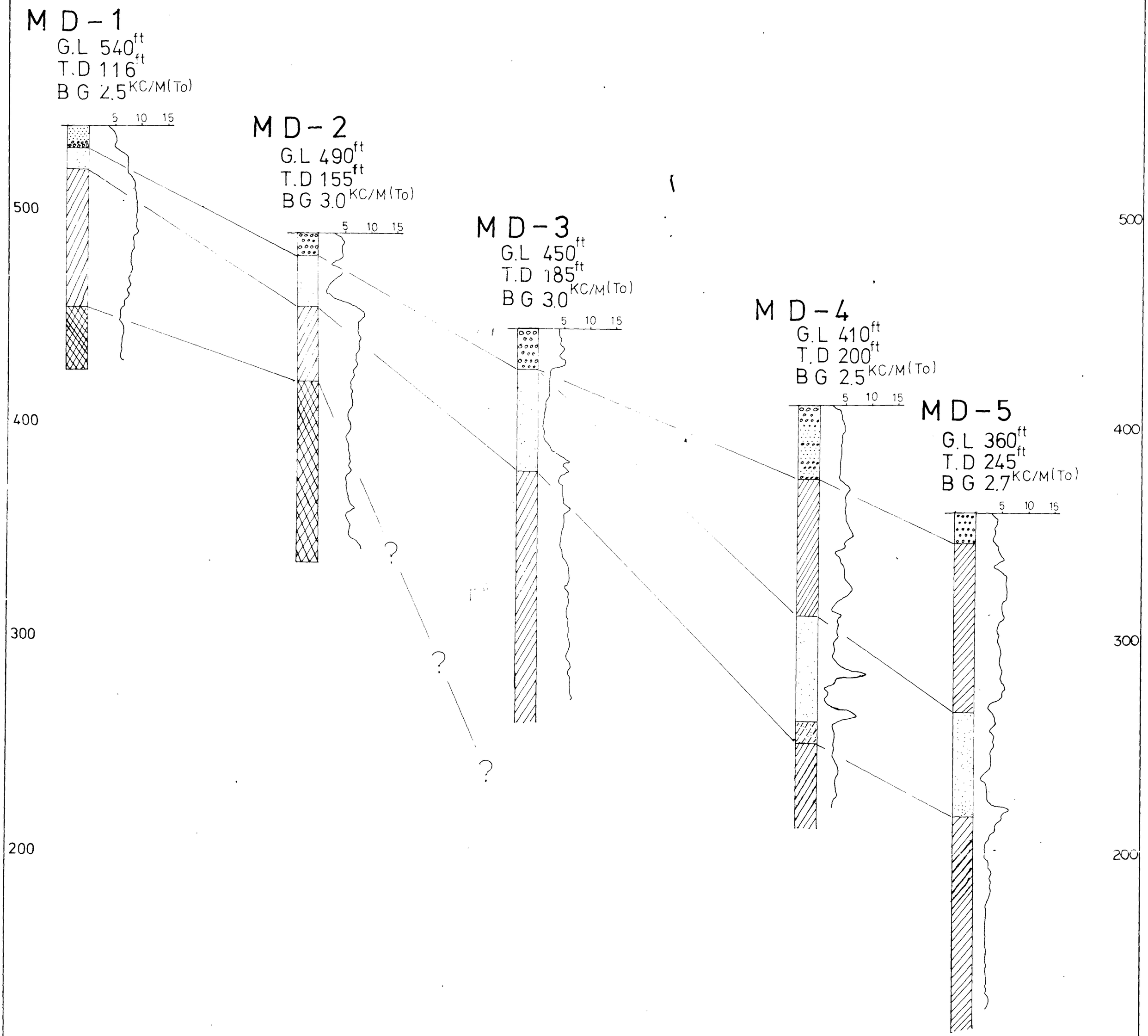
COLUMNAR SECTION OF DRILL HOLE

(LINE B - B')

Scale :	Plan No. D - 604
Date : October 1972	Drawn by : P.N.C.

ENV 1884-6

FIG.5



NISSHO-IWAI CO (AUST) PTY LTD

SML 660 MT DISTANCE AREA

COLUMNAR SECTION OF DRILL HOLE

(LINE C-C')

Scale :	Plan No. D-605
Date : October 1972	Drawn by : P.N.C

FIG. 6

ENV 1884-7

NISSHO-IWAI CO (AUST) PTY LTD	
SML 660 MT DISTANCE AREA	
COLUMNAR SECTION OF DRILL HOLE (LINE D – D')	
Scale :	Plan No. D – 606
Date : October 1972	Drawn by : P.N.C

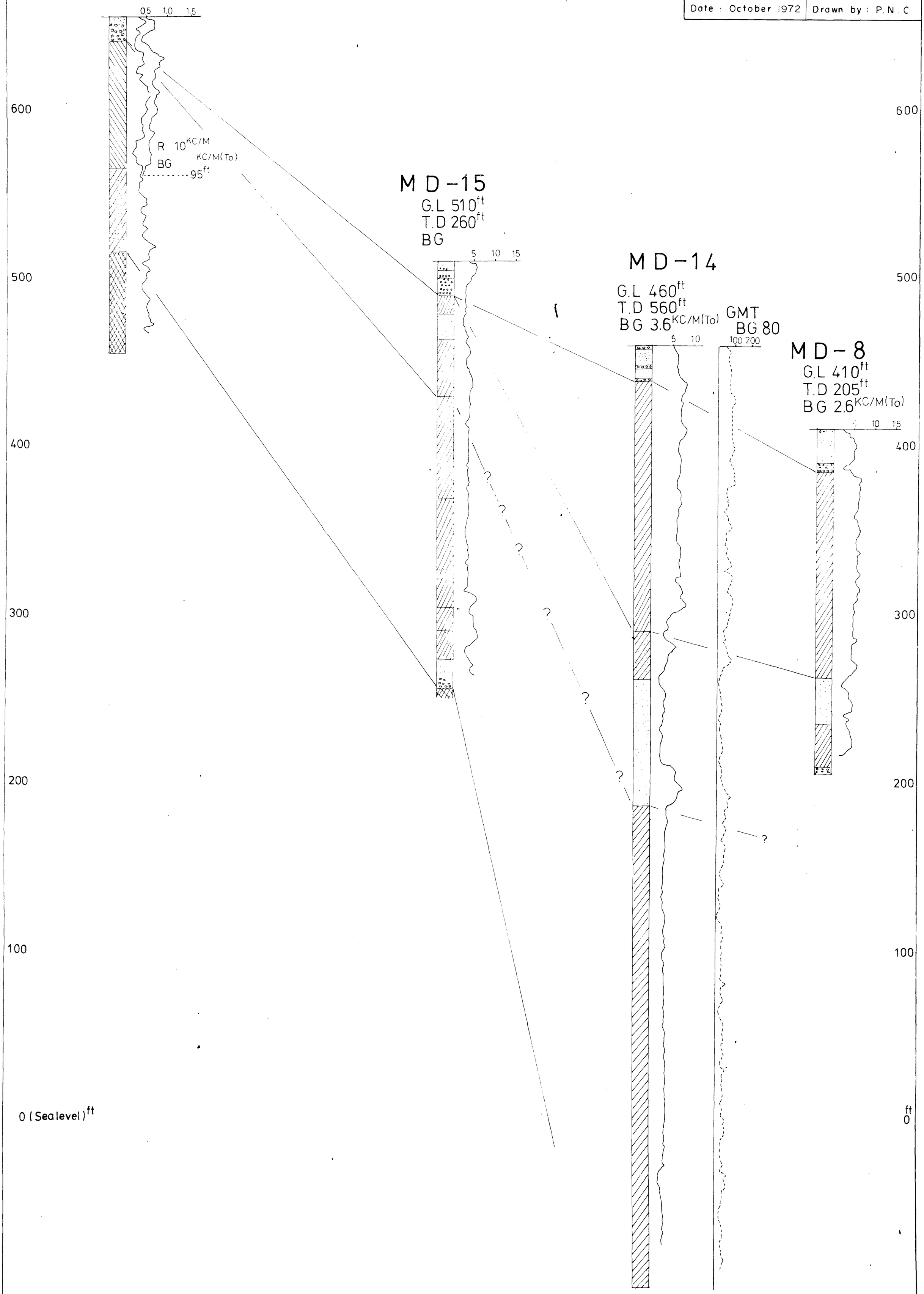
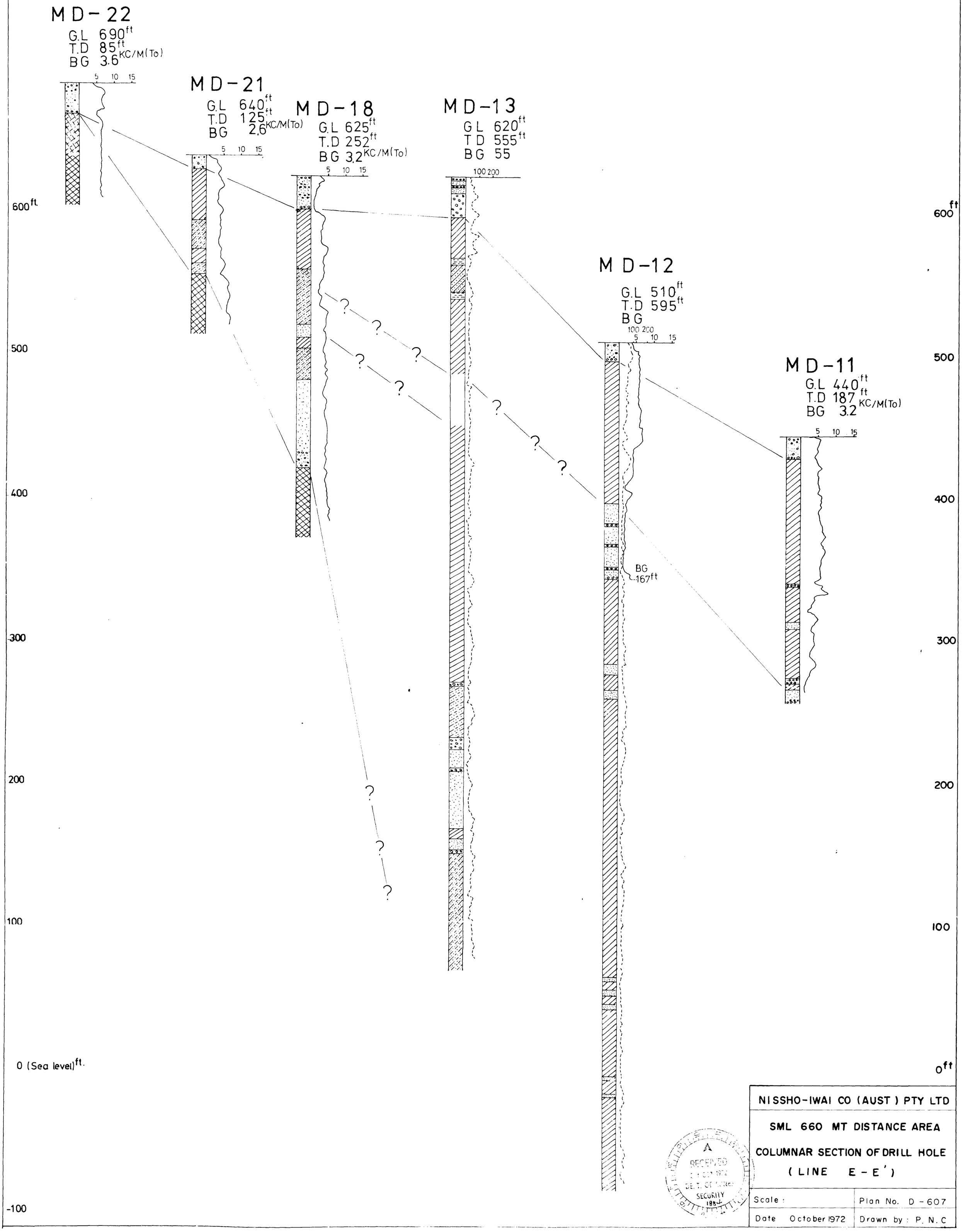


FIG. 7

ENV 1884-8



NISSHO-IWAI CO (AUST) PTY LTD

SML 660 MT DISTANCE AREA

COLUMNAR SECTION OF DRILL HOLE

(LINE E - E')

Scale :	Plan No. D - 607
Date October 1972	Drawn by : P. N. C

ENV 884-9

FIG. 8