CONTENTS ENVELOPE 1520 S.M.L. 498

TENEMENT: S.M.L. 498

TENEMENT HOLDER: Nissho-Iwai Co. (Australia) Pty. Ltd.,

CONTENTS ENVELOPE 1520 S.M.L. 498

CABLES: NISSHOIWAI MELBOURNE
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TELEX MELBOURNE 30353
HEAD OFFICE:
Nissho-Iwai Co. (Aust.) Pty. Ltd.
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NISSHO-IWAI CO. (AUSTRALIA) PTY. LTD.

(Incorp. in N.S.W.)
499 BOURKE ST., MELBOURNE, VICTORIA, AUSTRALIA
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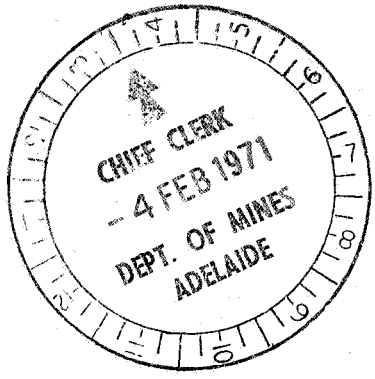
03

PARENT COMPANY:
Nissho-Iwai Co. Ltd.
Osaka, Tokyo.
And at
NEW YORK, LONDON.
60 other overseas offices.

OUR REF. UM-2732
YOUR REF.

YK/SK
MELBOURNE, 3rd February, 1971.



The Director of Mines,
Department of Mines,
169 Rundle Street,
ADELAIDE. S.A. 5000.

Dear Sir,

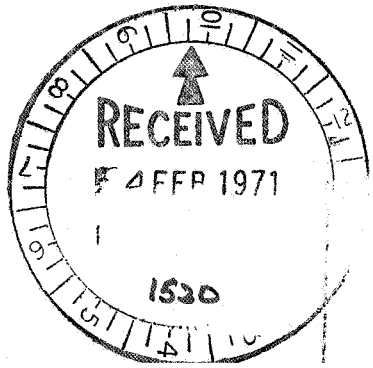
Special Mining Lease
Number 498
Corunna Area

We are pleased to hand to you with this letter, our first quarterly report dated 4th February, 1971 covering our exploration work on the above Special Mining Lease.

Yours faithfully,

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

Y. KANASAKI
Deputy General Manager



04

FIRST QUARTERLY REPORT

O N

SPECIAL MINING LEASE NO. 498

IN THE CORUNNA AREA

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

February 4, 1971

C O N T E N T S

05

ILLUSTRATIONS

INTRODUCTION

07

Special Mining Lease No. 498 had been secured in the Corunna area to study the possible occurrence of sedimentary Uranium type deposit in the Precambrian group. SML 463 had already been secured for the said district and is known to have the distribution of Corunna conglomerate belonging to the Proterozoic era similar to the Uno Range area where outcrop of intense radioactive anomaly had previously been detected.

The present field work had it's start at the beginning of December. Senior geologist K. HIRAKAWA of the Power Reactor and Nuclear Fuel Development Corporation (PNC) conducted the work throughout the first quarter under the directorship of the Exploration Manager.

Our primary purpose was to detect anomaly, to study it's occurrence, and it's extension on the surface, as well as to find clues for geochemical detection of sub-surface Uranium deposits.

Carborne radiometric survey conducted at the beginning of the work elucidated radiometric anomaly. Presently, analysis on U_3O_8 and ThO_2 in the rock samples of this district is carried out by AMDEL at Adelaide.

LOCATION AND ACCESSIBILITY

08

SML 498 is located 410 km road distance from Adelaide and 40 km east of Uno homestead. The distance from Iron Knob to Corunna homestead, at the southern border of the lease, is a mere 5 km in the NNW direction. The lease covers an area of 407 square kilometers extending over Corunna Station, Wartaka Station, Myall Creek Station and Pandurra Station. The area is readily accessible via the main unsealed road from Iron Knob and the unsealed roads which circumscribe Corunna Range. (See Figure 1)

TENURE

The application for Special Mining Lease of the area was submitted to the Mines Department of South Australia on October 1, 1970. SML 498 was granted for a period of twelve months commencing on November 5, 1970. The boundaries of the lease are as follows. (See Figure 1 and 2)

Longitudes	137°00' East at the western boundary.
	137°13' East at the eastern boundary.
Latitudes	32°31' South at the northern boundary.
	32°42' South at the southern boundary.

PHYSIOGRAPHY

09

The Corunna Range which is located at the centre of SML 498 is V-shaped and opens northward with a total extension of nearly 20 km. The southern part where triangular point, Corunna North (altitude 383 m) and Corunna South (altitude 376 m) are located, is a steep cliff towering from the surrounding flat land. However, this gradually looses it's height northward and changes into lower hill. The Range is composed of Corunna conglomerate of the Proterozoic era and the topography well reflects the geologic structure.

On the other hand, relatively less resistant Gawler Range volcanics form hills of 150-240 m at the northwestern part of the lease. The remaining low land around is composed of basement complex which is covered by alluvial sediment and is flat or slightly undulating. The eastern side of the range shows sporadic outcropping of Tertiary sediments from the alluvial sediment. The flat parts have an average altitude of 150-180 m and devoid of distinct drainage systems.

The area is arid, and vegetation is restricted to such types as salt bush, spinifex, myall tree, mallee and so on. In general, the flat plain has poor vegetation in comparison to the range part, and is often a semi-desert with salt bush. Average annual precipitation amounts to 200 mm. Well water is saline and unsuitable for drinking.

SUMMARY OF ACTIVITIES

The present survey was started on the beginning of December, 1970. Systematic carborne radiometric survey had been conducted over a distance of approximately 190 km at the beginning of the survey and as a result, radioactive anomaly had been detected 1.5 km north west of Corunna North. At the same time, water sampling had been carried out as a method for geochemical prospecting. Based upon the above results, geologic and radiometric surveys were conducted around the anomaly in the southern part of the Corunna Range. Chemical analysis and mineralogical studies of the samples are being carried out at the PNC laboratory in Japan.

GENERAL GEOLOGY

Geology around SML 498 is shown in the 1:250,000 scale geological map of Port Augusta. It's stratigraphy is indicated on Table 1.

The basement rock exposed in the area is composed of quartzite of Moonabie Formation and Burkitt granite belonging to the early Carpentarian period.

Table 1. Table of Stratigraphic Units

Age	Rock Unit	Lithology	Stratigraphic Relations
Quarter-nary	Alluvium	Soil, sand, gravel	Flat-lying on flat area
Tertiary		Silcrete cappings thin boulder beds, sandstone	Unconformably overlies Precambrian complex
Late Carpen-tarian	Gawler Range Volcanics	Red-brown porphy-ritic rhyolite with tuffaceous layers	A flat-lying or sheet of extrusives after deposition of Corunna Conglomerate
	Corunna Con-glomerate	Conglomerate, quartz sandstone, siltstone, tuff, quartzite	Unconformably over-lies Burkitt Granite Moonabie Formation
Early Carpen-tarian	Burkitt Granite	Massive hornblends granite	Unconformably over-lain by late Carpentarian sediments
	Moonabie Formation	Quartzite	Unconformably over-lain by late Carpen-tarian sediments

Moonabie Formation is distributed in the flat plain extending eastward to the Corunna Range while Burkitt granite is distributed with slight undulation at the southwestern part of the lease.

Corunna conglomerate of the late Carpentarian period in the Corunna Range covers these basements unconformably. It is mainly composed of conglomerate, quartzite, and quartz sandstone. The geologic structure of the Corunna Range is in general in the NNW-SSE direction passing through the bottom of the V-shape and is estimated to be a synclinal structure with it's axis gently inclining northward. In the east wing the bedding is variable and thus existence of faults were postulated. However, detailed geologic survey is required.

CARBORNE RADIOMETRIC SURVEY

Carborne radiometric survey was carried out over the whole of the lease area of approximately 190 km, TCS-R12 type scintillometer, JRC Co., Japan, was used.

Figure 3 shows the result of the carborne survey.

Distinct relationship between rock distribution and variance in the natural count was observed for this area similar to the Uno area. Rounded figures for the natural count in the flat plain are indicated in Table 2.

Table 2. The Average Value of Background Radioactivity

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Rock type	Radioactivity*
Tertiary rocks	1500 - 2000 cpm
Porphyritic rhyolite (Gawler Range Volcanics)	3500 - 4000
Quartzite (Corunna Conglomerate)	2000
Sandstone and conglomerate (Corunna Conglomerate)	2500
Granitic rocks (Burkitt Granite)	4500
Gneiss, schist and quartzite (Cleve Metamorphics)	3000
Quartzite (Moonabie Formation)	1500

* measured on the flat plain by Model TCS-R12 scintillometer

Anomalous points with readings 2-3 times that of the natural count had been detected in the Corunna conglomerate and Burkitt granite during the survey and indicated the necessity of future survey.

GEOLOGICAL AND RADIOMETRIC SURVEY

Following the detection of the anomaly by the carborne radiometric survey, geologic and radiometric survey was conducted at the west wing of the southern part of the Corunna Range. Geologic mapping, rock sampling, and radiometric survey on ground surface were planned for the intervals of 17 km on the southern part of the Corunna Range where it forms steep cliffsand shows good outcropping. As a start,

the survey was carried out along the 6 traverse lines, crossing to the strike of the formation in the 8 km distance at the west wing.

Figure 4 indicates the anomaly points and the traverse lines.

TCS-122 portable scintillometer was employed to measure radioactivity which was read every 5 m. In the area indicating anomaly, measurement was taken every 1 m.

The following facts were clarified as a result.

(1) Corunna conglomerate is divided in the following members from lower part; red sandstone member composed of reddish brown to purplish red boulder bearing cobble conglomerate and fine sandstone, grey sandstone member composed of pebbly quartz sandstone with thin layer of cobble conglomerate and pebble conglomerate, and quartzite member composed of laminated quartzite with thin layer of coarse sandstone.

(2) Grey sandstone member is distinguished from Red sandstone member by well graded cobble-pebble conglomerate bed.

(3) At the contact of grey sandstone and the upper quartzite member, there was an alternation zone of siliceous sandstone, pebble conglomerate and quartzite which graded into quartzite.

(4) Anomaly had been detected as much as 0.05-0.21 mr/h in the pebble conglomerate or pebbly sandstone of the grey sandstone member. This was at the alternation zone nearest to the boundary of the upper quartzite member. It was traced intermittently for a distance of 8 km on the same horizon.

(5) This anomalous layer will be correlated with that of the Uno Range.

(6) It is estimated that the anomaly had not been detected along line No. 3 because grey sandstone member is fragile, readily forms flat plain and is covered by residual soil and talus deposit.

On the basis of the above findings, detailed geologic survey of the Corunna area as well as radiometric survey of the whole area should be carried out.

GEOCHEMICAL RESEARCH ON WATER SAMPLES

A total of 14 water samples were collected from the wells and dams in the region as a method for chemical prospecting in the area. Sampling points and their U content within the lease are indicated in figure 3. Summarized result of water sample assay is indicated on Table 3.

Table 3. Results of Water Sample Assays

Sample No.	Locality	Type	pH	Salinity g/l	U* in ppb
19	Bornee Dam	Well	7.3	1.05	1.17
30	Corunna Station Well	Well	6.8	0.31	0.30
31	Tassies West Well	Well	7.0	0.31	0.23
33	Long Dam	Dam	7.0	0.06	1.9
34	Bruce Well	Well	7.0	0.44	0.8
35	Corunna North	Well	7.0	0.55	4.7
39	Warwicks Dam Well	Well	6.8	0.63	5.4
40	Tassies East Well	Well	6.6	0.34	0.44
42	Wartaka Reservoir Well	Well	7.5	1.09	7.30
43	Roberts Dam	Dam	7.3	0.09	0.22
44	Roberts Well	Well	7.5	1.81	7.05
45	Round Hill Bore Hole	Well	7.5	1.25	6.37
46	East Spearfelt Dam	Dam	7.3	0.00	0.15
47	B.H.P. Bore Hole	Well	7.8	0.97	0.47

* Assayed by P.N.C.

FURTHER EXPLORATION PROGRAM

The following field works are planned for the second quarterly prospecting of SML 498.

(1) Geologic and radiometric survey and sampling of rocks and soils along the traverse line at the east wing of the range.

(2) Sampling and analyses of stream sediments.

(3) Chemical analyses and mineralogical studies of rocks, soil and water samples collected on this survey.

K. HIRAKAWA, senior geologist of PNC, will conduct the above mentioned field works during the next survey period. The chemical analyses and mineralogical studies will be carried out at the PNC laboratory in Japan.

DMC 128

FORM DP 18A

DEPARTMENT OF MINES AND ENERGY — SOUTH AUSTRALIA

WATER WELL DATA FIELD SHEET

18

Unit Number: 01 (1–3) Repeated on each card (16)

Hund. — (17) Sec./Town (20) Allot. (24) Bore (27) Ref.No.

Landholder ... Address ...

Latitude/East (45) Longitude/North (52) Co-ord. Type (60) Zone Acc. (63)

Basin ...

Situation of Well ... W

DRILLING DATA (See over for Aquifer Data)

03 (1) Driller(s) ... Date Drilled: From ... to (17)

... Method used (25)

Rig operated by ... Purpose ... Status (29) (31) (33)

Depth Drilled ... m Angle ... Hole Diameter ... (35) M (41) (42)

Casing Yes / No From ... m to ... m Diameter ... Type ... (43) (44)

From ... m to ... m Diameter ... Type ... (50) (56)

From ... m to ... m Diameter ... Type ... (57) (61)

Screen/Slotted Liner: Present? Yes / No (62) Core Library No (63) Logging by (69) (70)

Screen/Slotted Liner Type ... Material ...

Interval: From ... m to ... m (71) (76)

04 (1) Samples obtained ... (17)

Analyses available ... (21)

MOST RECENT DATA

07 (1) Total depth ... m (17) M (23) Date (24) SWD ... m (32) M (37) Date (38)

Supply: Flowing? ... Flow Rate ... Method measured ... (46) (51)

Supply method ... Type ... Yield ... Method measured ... (52)

Power source ... Intake depth ... m Pump diameter ... (53)

Column diameter ... Drawdown ... m Duration of Test ... hrs. (54)

Date of Test .../.../19 (57) Status ... (60)

Sampling Method ... Depth sample taken ... m (62)

Analysis Results: Field Conductivity ... µm @ ... °C

310 (63) ~~Conductivity~~/Salinity (69) pH 7.0 (70)

Date 03 FEB 87 (73–80) AMDEL No. ... Deptmtl. No. ...

02 (1) Security Rating ... (17) Bore Folder No. (18)

Permit No. (24) Reference No. (30)

TASSIES WEST WELL (36–69)

Aerial Photo No. (73–80) Accuracy of Identification ...

Compiled ... Coding Check ...

N

Locality Plan

COMMENTS:

19

DATA FROM SML 498 Corunna, Envelope 1520, Dm 1158/70 VI

SAMPLE RESULT Uranium 0.23 ppb

ORIGINAL DATA

Unit Number 06 (1 3)

Repeated on each card 16

Supply method ..... Method of Measure ..... (17 18)

Duration of Test ..... (19) hours

1st. Aquifer: Depth water cut ..... m SWD ..... m (23 • 28 M 29)

Drawdown ..... m Supply ..... (34 39)

Conductivity/Salinity ..... Aquifer developed? ..... (40 46 47) pH (48)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

2nd. Aquifer: Depth water cut ..... m SWD ..... m (51 • 56 M 57)

Drawdown ..... m Supply ..... (62 67)

Conductivity/Salinity ..... Aquifer developed? ..... (68 74 75) pH (76)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

06

3rd. Aquifer: Depth water cut ..... m SWD ..... m (23 • 28 M 29)

Drawdown ..... m Supply ..... (34 39)

Conductivity/Salinity ..... Aquifer developed? ..... (40 46 47) pH (48)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

4th. Aquifer: Depth water cut ..... m SWD ..... m (51 • 56 M 57)

Drawdown ..... m Supply ..... (62 67)

Conductivity/Salinity ..... Aquifer developed? ..... (68 74 75) pH (76)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

DMC 128

FORM DP 18A

DEPARTMENT OF MINES AND ENERGY — SOUTH AUSTRALIA

WATER WELL DATA FIELD SHEET

20

Unit Number: 01 (1–3) Repeated on each card (16)

Hund. ~ (17) Sec./Town (20) Allot. (24) Bore (27) Ref.No.

Landholder ... Address ...

Latitude/East (45) Longitude/North (52) Co-ord. Type (60) Zone Acc. (63)

Basin ...

Situation of Well W

DRILLING DATA (See over for Aquifer Data)

03 (1) Driller(s) ... Date Drilled: From ... to (17)

... Method used (25)

Rig operated by ... Purpose ... Status (29) (31) (33)

Depth Drilled ... m Angle ... Hole Diameter ... (35) M (41) (42)

Casing Yes/No From ... m to ... m Diameter ... Type ... (43) (44)

From ... m to ... m Diameter ... Type ... (50) (56)

From ... m to ... m Diameter ... Type ... (57) (61)

Screen/Slotted Liner: Present? Yes/No (62) Core Library No (63) Logging by (69) (70)

Screen/Slotted Liner Type ... Material ...

Interval: From ... m to ... m (71) (76)

04 (1) Samples obtained (17)

Analyses available (21)

MOST RECENT DATA

07 (1) Total depth ... m (17) M (23) Date (24) SWD ... m (32) M (37) Date (38)

Supply: Flowing? ... Flow Rate ... Method measured (46) (51)

Supply method ... Type ... Yield ... Method measured (52)

Power source ... Intake depth ... m Pump diameter (53)

Column diameter ... Drawdown ... m Duration of Test ... hrs. (54)

Date of Test .../.../19 (57) Status (60)

Sampling Method ... Depth sample taken ... m (62)

Analysis Results: Field Conductivity ... µm @ ... °C

440 (63) ~~Conductivity~~/Salinity (69) pH 7.0 (70)

Date 03FEB71 (73–80) AMDEL No. ... Deptmtl. No. ...

02 (1) Security Rating ... (17) Bore Folder No. (18)

Permit No. (24) Reference No. (30)

BRUCE WELL (36–69)

Aerial Photo No. (73–80) Accuracy of Identification ...

Compiled ... Coding Check ...

N

Locality Plan

COMMENTS:

21

DATA FROM SML 498 Corumna, ENVELOPE 1520, VI

Dm 1158/70

SAMPLE RESULT Uranium 0.8 ppb.

ORIGINAL DATA

Unit Number 06 (1 3)

Repeated on each card 16

Supply method ..... Method of Measure ..... (17 18)

Duration of Test ..... (19) hours

1st. Aquifer: Depth water cut ..... m SWD ..... m (23) M (28) (29)

Drawdown ..... m Supply ..... (34) (39)

Conductivity/Salinity ..... Aquifer developed? ..... (40) (46) (47) pH (48)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

2nd. Aquifer: Depth water cut ..... m SWD ..... m (51) M (56) (57)

Drawdown ..... m Supply ..... (62) (67)

Conductivity/Salinity ..... Aquifer developed? ..... (68) (74) (75) pH (76)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

06

3rd. Aquifer: Depth water cut ..... m SWD ..... m (23) M (28) (29)

Drawdown ..... m Supply ..... (34) (39)

Conductivity/Salinity ..... Aquifer developed? ..... (40) (46) (47) pH (48)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

4th. Aquifer: Depth water cut ..... m SWD ..... m (51) M (56) (57)

Drawdown ..... m Supply ..... (62) (67)

Conductivity/Salinity ..... Aquifer developed? ..... (68) (74) (75) pH (76)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

DMC 128

FORM DP 18A

DEPARTMENT OF MINES AND ENERGY — SOUTH AUSTRALIA

WATER WELL DATA FIELD SHEET

Ref.No. 22

01 Unit Number (1–3) Repeated on each card (16) Hund. (17) Sec./Town (20) Allot. (24) Bore (27)

Landholder Address

Latitude/East (45) Longitude/North (52) Co-ord. Type (60) Zone Acc. (63) Basin

Situation of Well W

DRILLING DATA (See over for Aquifer Data)

03 (1) Driller(s) Date Drilled: From to (17)

Method used (25)

Rig operated by Purpose Status (29, 31, 33)

Depth Drilled m Angle Hole Diameter (35, M 41, 42)

Casing Yes/No From m to m Diameter Type (43, 44)

From m to m Diameter Type (50, 56)

From m to m Diameter Type (57, 61)

Screen/Slotted Liner: Present? Yes/No (62) Core Library No (63) Logging by (69, 70)

Screen/Slotted Liner Type Material

Interval: From m to m (71, 76)

04 (1) Samples obtained (17)

Analyses available (21)

MOST RECENT DATA

07 (1) Total depth m (17, M 23) Date (24) SWD m (32, M 37) Date (38)

Supply: Flowing? Flow Rate Method measured (46, 51)

Supply method Type Yield Method measured (52)

Power source Intake depth m Pump diameter (53)

Column diameter Drawdown m Duration of Test hrs. (54)

Date of Test / /19 (57) Status (60)

Sampling Method Depth sample taken m (62)

Analysis Results: Field Conductivity µm @ °C

550 (63) ~~Conductivity~~/Salinity (69) pH 7.0 (70)

Date 03 FEB 97 (73–80) AMDEL No. Deptmtl. No.

02 (1) Security Rating (17) Bore Folder No. (18)

Permit No. (24) Reference No. (30)

CORUNNA NORTH WELL (36–69)

Aerial Photo No. (73–80) Accuracy of Identification

Compiled Coding Check

N

Locality Plan

COMMENTS:

Data from SMA 498 Corunna, ENVELOPE 1520, Dm 1158/70 VI

Sample Results Uranium 4.7 ppb.

ORIGINAL DATA

Unit Number 06 (1 3 Repeated on each card 16)

Supply method ..... Method of Measure ..... (17 18)

Duration of Test ..... (19) hours

1st. Aquifer: Depth water cut ..... m SWD ..... m (23 • 28 M 29)

Drawdown ..... m Supply ..... (34 39)

Conductivity/Salinity ..... Aquifer developed? ..... (40 46 47) pH (48)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

2nd. Aquifer: Depth water cut ..... m SWD ..... m (51 • 56 M 57)

Drawdown ..... m Supply ..... (62 67)

Conductivity/Salinity ..... Aquifer developed? ..... (68 74 75) pH (76)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

06

3rd. Aquifer: Depth water cut ..... m SWD ..... m (23 • 28 M 29)

Drawdown ..... m Supply ..... (34 39)

Conductivity/Salinity ..... Aquifer developed? ..... (40 46 47) pH (48)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

4th. Aquifer: Depth water cut ..... m SWD ..... m (51 • 56 M 57)

Drawdown ..... m Supply ..... (62 67)

Conductivity/Salinity ..... Aquifer developed? ..... (68 74 75) pH (76)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

DMC 128

FORM DP 18A

DEPARTMENT OF MINES AND ENERGY — SOUTH AUSTRALIA

WATER WELL DATA FIELD SHEET

Unit Number: 01 (1–3) Repeated on each card (16)

Ref.No. 24

Hund. (17) Sec./Town (20) Allot. (24) Bore (27)

Landholder ... Address ...

Latitude/East (45) Longitude/North (52) Co-ord. Type (60) Zone Acc. (63)

Basin ...

Situation of Well ... W

DRILLING DATA (See over for Aquifer Data)

03 (1) Driller(s) ... Date Drilled: From ... to (17)

Method used (25)

Rig operated by ... Purpose ... Status (29, 31, 33)

Depth Drilled ... m Angle ... Hole Diameter ... (35) M (41) (42)

Casing Yes/No From ... m to ... m Diameter ... Type ... (43) (44)

From ... m to ... m Diameter ... Type ... (50) (56)

From ... m to ... m Diameter ... Type ... (57) (61)

Screen/Slotted Liner: Present? Yes/No (62) Core Library No (63) Logging by (69) (70)

Screen/Slotted Liner Type ... Material ...

Interval: From ... m to ... m (71) (76)

04 (1) Samples obtained (17)

Analyses available (21)

MOST RECENT DATA

07 (1) Total depth ... m (17) M (23) Date (24) SWD ... m (32) M (37) Date (38)

Supply: Flowing? ... Flow Rate ... Method measured ... (46) (51)

Supply method ... Type ... Yield ... Method measured ... (52)

Power source ... Intake depth ... m Pump diameter ... (53)

Column diameter ... Drawdown ... m Duration of Test ... hrs. (54)

Date of Test ... / ... / 19 (57) Status ... (60)

Sampling Method ... Depth sample taken ... m (62)

Analysis Results: Field Conductivity ... µm @ ... °C

(63) 630 Conductivity/Salinity (69) pH 6.8 (70)

Date 03 FEB 71 (73–80) AMDEL No. ... Deptmtl. No. ...

02 (1) Security Rating ... (17) Bore Folder No. (18)

Permit No. (24) Reference No. (30)

WARWICKS DAM WELL (36–69)

Aerial Photo No. (73–80) Accuracy of Identification ...

Compiled ... Coding Check ...

N

Locality Plan

COMMENTS:

Data from SANL 498 Corunna, ENVELOPE 1520, Dm 1158/70 VI

Sample Results @ Uranium 5.4 ppb.

ORIGINAL DATA

Unit Number 06 (1 3)

Repeated on each card 16

Supply method ..... Method of Measure ..... (17 18)

Duration of Test ..... (19) hours

1st. Aquifer: Depth water cut ..... m SWD ..... m (23 • 28 M 29 •)

Drawdown ..... m Supply ..... (34 39)

Conductivity/Salinity ..... Aquifer developed? ..... (40 46 47) pH (48 •)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

2nd. Aquifer: Depth water cut ..... m SWD ..... m (51 • 56 M 57 •)

Drawdown ..... m Supply ..... (62 67)

Conductivity/Salinity ..... Aquifer developed? ..... (68 74 75) pH (76 •)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

06

3rd. Aquifer: Depth water cut ..... m SWD ..... m (23 • 28 M 29 •)

Drawdown ..... m Supply ..... (34 39)

Conductivity/Salinity ..... Aquifer developed? ..... (40 46 47) pH (48 •)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

4th. Aquifer: Depth water cut ..... m SWD ..... m (51 • 56 M 57 •)

Drawdown ..... m Supply ..... (62 67)

Conductivity/Salinity ..... Aquifer developed? ..... (68 74 75) pH (76 •)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

DMC 128

FORM DP 18A

DEPARTMENT OF MINES AND ENERGY — SOUTH AUSTRALIA

WATER WELL DATA FIELD SHEET

26

Unit Number: 01 (1–3) Repeated on each card (16)

Hund. (17) Sec./Town (20) Allot. (24) Bore (27) Ref.No.

Landholder Address

Latitude/East (45) Longitude/North (52) Co-ord. Type (60) Zone Acc. (63)

Basin

Situation of Well W

DRILLING DATA (See over for Aquifer Data)

03 (1) Driller(s) Date Drilled: From to (17)

Method used (25)

Rig operated by Purpose Status (29, 31, 33)

Depth Drilled m Angle Hole Diameter (35, M 41, 42)

Casing Yes/No From m to m Diameter Type (43, 44)

From m to m Diameter Type (50, 56)

From m to m Diameter Type (57, 61)

Screen/Slotted Liner: Present? Yes/No (62) Core Library No (63) Logging by (69, 70)

Screen/Slotted Liner Type Material

Interval: From m to m (71, 76)

04 (1) Samples obtained (17)

Analyses available (21)

MOST RECENT DATA

07 (1) Total depth m (17, M 23) Date (24) SWD m (32, M 37) Date (38)

Supply: Flowing? Flow Rate Method measured (46, 51)

Supply method Type Yield Method measured (52)

Power source Intake depth m Pump diameter (53)

Column diameter Drawdown m Duration of Test hrs. (54)

Date of Test / / 19 (57) Status (60)

Sampling Method Depth sample taken m (62)

Analysis Results: Field Conductivity µm @ °C

310 (63) ~~Conductivity~~/Salinity (69) pH 6.8 (70)

Date 03FEB971 (73–80) AMDEL No. Deptmtl. No.

02 (1) Security Rating (17) Bore Folder No. (18)

Permit No. (24) Reference No. (30)

CORUNNA STATION WELL (36–69)

Aerial Photo No. (73–80) Accuracy of Identification

Compiled Coding Check

N

Locality Plan

COMMENTS:

27

DATA FROM SML 498 Corunna, ENVELOPE 1520 V1, Dm 1158/70

SAMPLE RESULTS pH = 6.8, Salinity 310 mg/l,

Uranium 0.30 p.p.b.

ORIGINAL DATA

Unit Number

0,6

1 3 Repeated on each card 16

Supply method ..... Method of Measure 17 18

Duration of Test ..... 19 hours

1st. Aquifer: Depth water cut ..... m SWD ..... m 23 M 28 29

Drawdown ..... m Supply 34 39

Conductivity/Salinity ..... Aquifer developed? ..... 40 46 47 pH 48

Depth sample taken ..... m Sampling method ..... Analysis No. .....

2nd. Aquifer: Depth water cut ..... m SWD ..... m 51 M 56 57

Drawdown ..... m Supply 62 67

Conductivity/Salinity ..... Aquifer developed? ..... 68 74 75 pH 76

Depth sample taken ..... m Sampling method ..... Analysis No. .....

0,6

3rd. Aquifer: Depth water cut ..... m SWD ..... m 23 M 28 29

Drawdown ..... m Supply 34 39

Conductivity/Salinity ..... Aquifer developed? ..... 40 46 47 pH 48

Depth sample taken ..... m Sampling method ..... Analysis No. .....

4th. Aquifer: Depth water cut ..... m SWD ..... m 51 M 56 57

Drawdown ..... m Supply 62 67

Conductivity/Salinity ..... Aquifer developed? ..... 68 74 75 pH 76

Depth sample taken ..... m Sampling method ..... Analysis No. .....

DMC 128

FORM DP 18A

DEPARTMENT OF MINES AND ENERGY — SOUTH AUSTRALIA

WATER WELL DATA FIELD SHEET

Ref.No. 28

01 Unit Number (1–3) Repeated on each card (16)

Hund. (17) Sec./Town (20) Allot. (24) Bore (27)

Landholder ... Address ...

Latitude/East (45) Longitude/North (52) Co-ord. Type (60) Zone Acc. (63)

Basin ...

Situation of Well ...

DRILLING DATA (See over for Aquifer Data)

03 (1) Driller(s) ... Date Drilled: From ... to (17)

... Method used (25)

Rig operated by ... Purpose ... Status (29) (31) (33)

Depth Drilled ... m Angle ... Hole Diameter ... (35) M (41) (42)

Casing Yes/No From ... m to ... m Diameter ... Type ... (43) (44)

From ... m to ... m Diameter ... Type ... (50) (56)

From ... m to ... m Diameter ... Type ... (57) (61)

Screen/Slotted Liner: Present? Yes/No (62) Core Library No (63) Logging by (69) (70)

Screen/Slotted Liner Type ... Material ...

Interval: From ... m to ... m (71) (76)

04 (1) Samples obtained (17)

Analyses available (21)

MOST RECENT DATA

07 (1) Total depth ... m (17) M (23) Date (24) SWD ... m (32) M (37) Date (38)

Supply: Flowing? ... Flow Rate ... Method measured ... (46) (51)

Supply method ... Type ... Yield ... Method measured ... (52)

Power source ... Intake depth ... m Pump diameter ... (53)

Column diameter ... Drawdown ... m Duration of Test ... hrs. (54)

Date of Test .../.../19 (57) Status ... (60)

Sampling Method ... Depth sample taken ... m (62)

Analysis Results: Field Conductivity ... µm @ ... °C

1050 (63) Conductivity/Salinity (69) pH 7.3 (70)

Date 03 FEB 97 (73–80) AMDEL No. ... Deptmtl. No. ...

02 (1) Security Rating ... (17) Bore Folder No. (18)

Permit No. (24) Reference No. (30)

BORNEE DAM (36–69)

Aerial Photo No. (73–80) Accuracy of Identification ...

Compiled ... Coding Check ...

N

Locality Plan

COMMENTS:

Data From SML Comunna, ENVELOPE 1520, Dm 1158/70
VI

Sample Result

Uranium 1.17 ppb

ORIGINAL DATA

Unit Number 06 (1 3)

Repeated on each card 16

Supply method ..... Method of Measure ..... (17 18)

Duration of Test ..... (19) hours

1st. Aquifer: Depth water cut ..... m SWD ..... m (23) M (28) (29)

Drawdown ..... m Supply ..... (34) (39)

Conductivity/Salinity ..... Aquifer developed? ..... (40) (46) (47) pH (48)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

2nd. Aquifer: Depth water cut ..... m SWD ..... m (51) M (56) (57)

Drawdown ..... m Supply ..... (62) (67)

Conductivity/Salinity ..... Aquifer developed? ..... (68) (74) (75) pH (76)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

06

3rd. Aquifer: Depth water cut ..... m SWD ..... m (23) M (28) (29)

Drawdown ..... m Supply ..... (34) (39)

Conductivity/Salinity ..... Aquifer developed? ..... (40) (46) (47) pH (48)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

4th. Aquifer: Depth water cut ..... m SWD ..... m (51) M (56) (57)

Drawdown ..... m Supply ..... (62) (67)

Conductivity/Salinity ..... Aquifer developed? ..... (68) (74) (75) pH (76)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

DMC 128

FORM DP 18A

DEPARTMENT OF MINES AND ENERGY — SOUTH AUSTRALIA

WATER WELL DATA FIELD SHEET

Ref. No. 30

01 Unit Number (1, 3) Repeated on each card (16)

Hund. (17) Sec./Town (20) Allot. (24) Bore (27)

Landholder ... Address ...

Latitude/East (45) Longitude/North (52) Co-ord. Type (60) Zone Acc. (63)

Basin ...

Situation of Well ... W

DRILLING DATA (See over for Aquifer Data)

03 (1) Driller(s) ... Date Drilled: From ... to (17)

Method used (25)

Rig operated by ... Purpose ... Status (29, 31, 33)

Depth Drilled ... m Angle ... Hole Diameter ... (35) M (41) (42)

Casing Yes/No From ... m to ... m Diameter ... Type ... (43) (44)

From ... m to ... m Diameter ... Type ... (50) (56)

From ... m to ... m Diameter ... Type ... (57) (61)

Screen/Slotted Liner: Present? Yes/No (62) Core Library No (63) Logging by (69, 70)

Screen/Slotted Liner Type ... Material ...

Interval: From ... m to ... m (71, 76)

04 (1) Samples obtained (17)

Analyses available (21)

MOST RECENT DATA

07 (1) Total depth ... m (17) M (23) Date (24) SWD ... m (32) M (37) Date (38)

Supply: Flowing? ... Flow Rate ... Method measured ... (46) (51)

Supply method ... Type ... Yield ... Method measured ... (52)

Power source ... Intake depth ... m Pump diameter ... (53)

Column diameter ... Drawdown ... m Duration of Test ... hrs. (54)

Date of Test .../.../19 (57) Status ... (60)

Sampling Method ... Depth sample taken ... m (62)

Analysis Results: Field Conductivity ... µm @ ... °C

(63) 340 Conductivity/Salinity (69) pH 6.6 (70)

Date 03 FEB 81 (73, 80) AMDEL No. ... Deptmtl. No. ...

02 (1) Security Rating ... (17) Bore Folder No. (18)

Permit No. (24) Reference No. (30)

TASSIES EAST WELL (36, 50, 60, 69)

Aerial Photo No. (73, 80) Accuracy of Identification ...

Compiled ... Coding Check ...

N

Locality Plan

COMMENTS:

31

DATA FROM SML Corunna, ENVELOPE 1529, Dm 1158/70
VI

Sample Result

Uranium 0.44 ppb.

ORIGINAL DATA

Unit Number 06 (1 3)

Repeated on each card 16

Supply method ..... Method of Measure 17 18

Duration of Test ..... 19 hours

1st. Aquifer: Depth water cut ..... m SWD ..... m 23 M 28 29

Drawdown ..... m Supply 34 39

Conductivity/Salinity ..... Aquifer developed? ..... 40 46 47 pH 48

Depth sample taken ..... m Sampling method ..... Analysis No. .....

2nd. Aquifer: Depth water cut ..... m SWD ..... m 51 M 56 57

Drawdown ..... m Supply 62 67

Conductivity/Salinity ..... Aquifer developed? ..... 68 74 75 pH 76

Depth sample taken ..... m Sampling method ..... Analysis No. .....

06

3rd. Aquifer: Depth water cut ..... m SWD ..... m 23 M 28 29

Drawdown ..... m Supply 34 39

Conductivity/Salinity ..... Aquifer developed? ..... 40 46 47 pH 48

Depth sample taken ..... m Sampling method ..... Analysis No. .....

4th. Aquifer: Depth water cut ..... m SWD ..... m 51 M 56 57

Drawdown ..... m Supply 62 67

Conductivity/Salinity ..... Aquifer developed? ..... 68 74 75 pH 76

Depth sample taken ..... m Sampling method ..... Analysis No. .....

DMC 128

FORM DP 18A

DEPARTMENT OF MINES AND ENERGY — SOUTH AUSTRALIA

WATER WELL DATA FIELD SHEET

Unit Number: 01 (1–3) Repeated on each card (16)

Hund. (17) Sec./Town (20) Allot. (24) Bore (27) Ref.No. 32

Landholder ..... Address .....

Latitude/East (45) Longitude/North (52) Co-ord. Type (60) Zone Acc. (63)

Basin .....

Situation of Well ..... W .....

DRILLING DATA (See over for Aquifer Data)

03 (1) Driller(s) ..... Date Drilled: From ..... to (17)

..... Method used (25)

Rig operated by ..... Purpose ..... Status (29) (31) (33)

Depth Drilled ..... m Angle ..... Hole Diameter ..... (35) M (41) (42)

Casing Yes/No From ..... m to ..... m Diameter ..... Type ..... (43) (44)

From ..... m to ..... m Diameter ..... Type ..... (50) (56)

From ..... m to ..... m Diameter ..... Type ..... (57) (61)

Screen/Slotted Liner: Present? Yes/No (62) Core Library No (63) Logging by (69) (70)

Screen/Slotted Liner Type ..... Material .....

Interval: From ..... m to ..... m (71) (76)

04 (1) Samples obtained ..... (17)

Analyses available ..... (21)

MOST RECENT DATA

07 (1) Total depth ..... m (17) M (23) Date (24) SWD ..... m (32) M (37) Date (38)

Supply: Flowing? ..... Flow Rate ..... Method measured ..... (46) (51)

Supply method ..... Type ..... Yield ..... Method measured ..... (52)

Power source ..... Intake depth ..... m Pump diameter ..... (53)

Column diameter ..... Drawdown ..... m Duration of Test ..... hrs. (54)

Date of Test ../../19 (57) Status ..... (60)

Sampling Method ..... Depth sample taken ..... m (62)

Analysis Results: Field Conductivity ..... µm @ ..... °C

1090 (63) ~~Conductivity~~/Salinity (69) pH 7.5 (70)

Date 03FEB971 (73–80) AMDEL No. ..... Deptmtl. No. .....

02 (1) Security Rating ..... (17) Bore Folder No. (18)

Permit No. (24) Reference No. (30)

WARTAKA RESERVOIR WELL (36–69)

Aerial Photo No. (73–80) Accuracy of Identification .....

Compiled ..... Coding Check .....

N

Locality Plan

COMMENTS: 33

DATA FROM SML Corunna, ENVELOPE 1520, Dm 1158/70

Sample Results VI

Uranium 7.30 ppb

ORIGINAL DATA

Unit Number 0.6 (1 3 Repeated on each card 16)

Supply method ..... Method of Measure ..... (17 18)

Duration of Test ..... (19) hours

1st. Aquifer: Depth water cut ..... m SWD ..... m (23) M (28) (29)

Drawdown ..... m Supply ..... (34) (39)

Conductivity/Salinity ..... Aquifer developed? ..... (40) (46) (47) pH (48)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

2nd. Aquifer: Depth water cut ..... m SWD ..... m (51) M (56) (57)

Drawdown ..... m Supply ..... (62) (67)

Conductivity/Salinity ..... Aquifer developed? ..... (68) (74) (75) pH (76)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

0.6

3rd. Aquifer: Depth water cut ..... m SWD ..... m (23) M (28) (29)

Drawdown ..... m Supply ..... (34) (39)

Conductivity/Salinity ..... Aquifer developed? ..... (40) (46) (47) pH (48)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

4th. Aquifer: Depth water cut ..... m SWD ..... m (51) M (56) (57)

Drawdown ..... m Supply ..... (62) (67)

Conductivity/Salinity ..... Aquifer developed? ..... (68) (74) (75) pH (76)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

DMC 128

FORM DP 18A

DEPARTMENT OF MINES AND ENERGY — SOUTH AUSTRALIA

WATER WELL DATA FIELD SHEET

34

Unit Number: 01 (1, 3) Repeated on each card (16)

Hund. (17) Sec./Town (20) Allot. (24) Bore (27) Ref.No.

Landholder ... Address ...

Latitude/East (45) Longitude/North (52) Co-ord. Type (60) Zone Acc. (63)

Basin ...

Situation of Well ... W

DRILLING DATA (See over for Aquifer Data)

03 (1) Driller(s) ... Date Drilled: From ... to (17)

Method used (25)

Rig operated by ... Purpose ... Status (29, 31, 33)

Depth Drilled ... m Angle ... Hole Diameter ... (35) M (41) (42)

Casing Yes/No From ... m to ... m Diameter ... Type ... (43) (44)

From ... m to ... m Diameter ... Type ... (50) (56)

From ... m to ... m Diameter ... Type ... (57) (61)

Screen/Slotted Liner: Present? Yes/No (62) Core Library No (63) Logging by (69) (70)

Screen/Slotted Liner Type ... Material ...

Interval: From ... m to ... m (71) (76)

04 (1) Samples obtained (17)

Analyses available (21)

MOST RECENT DATA

07 (1) Total depth ... m (17) M (23) Date (24) SWD ... m (32) M (37) Date (38)

Supply: Flowing? ... Flow Rate ... Method measured ... (46) (51)

Supply method ... Type ... Yield ... Method measured ... (52)

Power source ... Intake depth ... m Pump diameter ... (53)

Column diameter ... Drawdown ... m Duration of Test ... hrs. (54)

Date of Test .../.../19 (57) Status (60)

Sampling Method ... Depth sample taken ... m (62)

Analysis Results: Field Conductivity ... µm @ ... °C

1810 (63) Conductivity/Salinity (69) pH 7.5 (70)

Date 03FEB971 (73, 80) AMDEL No. ... Deptmtl. No. ...

02 (1) Security Rating ... (17) Bore Folder No. (18)

Permit No. (24) Reference No. (30)

ROBERTS WELL (36, 50, 60, 69)

Aerial Photo No. (73, 80) Accuracy of Identification ...

Compiled ... Coding Check ...

N

Locality Plan

COMMENTS:

35

DATA FROM SML Comma, ENVELOPE, 1520, Dm 1158/70

VI

Sample Results

Uranium 7.05 ppb.

ORIGINAL DATA

Unit Number

0,6

1 3 Repeated on each card 16

Supply method ..... Method of Measure 17 18

Duration of Test ..... 19 hours

1st. Aquifer: Depth water cut ..... m SWD ..... m 23 M 28 29

Drawdown ..... m Supply 34 39

Conductivity/Salinity ..... Aquifer developed? ..... 40 46 47 pH 48

Depth sample taken ..... m Sampling method ..... Analysis No. .....

2nd. Aquifer: Depth water cut ..... m SWD ..... m 51 M 56 57

Drawdown ..... m Supply 62 67

Conductivity/Salinity ..... Aquifer developed? ..... 68 74 75 pH 76

Depth sample taken ..... m Sampling method ..... Analysis No. .....

0,6

3rd. Aquifer: Depth water cut ..... m SWD ..... m 23 M 28 29

Drawdown ..... m Supply 34 39

Conductivity/Salinity ..... Aquifer developed? ..... 40 46 47 pH 48

Depth sample taken ..... m Sampling method ..... Analysis No. .....

4th. Aquifer: Depth water cut ..... m SWD ..... m 51 M 56 57

Drawdown ..... m Supply 62 67

Conductivity/Salinity ..... Aquifer developed? ..... 68 74 75 pH 76

Depth sample taken ..... m Sampling method ..... Analysis No. .....

DMC 128

FORM DP 18A

DEPARTMENT OF MINES AND ENERGY — SOUTH AUSTRALIA

WATER WELL DATA FIELD SHEET

Unit Number 01 (1, 3) Repeated on each card (16) Hund. (17) Sec./Town (20) Allot. (24) Bore (27) Ref.No. 36

Landholder ... Address ...

Latitude/East (45) Longitude/North (52) Co-ord. Type (60) Zone Acc. (63) Basin ...

Situation of Well B

DRILLING DATA (See over for Aquifer Data)

03 (1) Driller(s) ... Date Drilled: From ... to (17)

... Method used (25)

Rig operated by ... Purpose ... Status (29, 31, 33)

Depth Drilled ... m Angle ... Hole Diameter ... (35) M (41) (42)

Casing Yes/No From ... m to ... m Diameter ... Type ... (43) (44)

From ... m to ... m Diameter ... Type ... (50) (56)

From ... m to ... m Diameter ... Type ... (57) (61)

Screen/Slotted Liner: Present? Yes/No (62) Core Library No (63) Logging by (69, 70)

Screen/Slotted Liner Type ... Material ...

Interval: From ... m to ... m (71, 76)

04 (1) Samples obtained ... (17)

Analyses available ... (21)

MOST RECENT DATA

07 (1) Total depth ... m (17) M (23) Date (24) SWD ... m (32) M (37) Date (38)

Supply: Flowing? ... Flow Rate ... Method measured ... (46, 51)

Supply method ... Type ... Yield ... Method measured ... (52)

Power source ... Intake depth ... m Pump diameter ... (53)

Column diameter ... Drawdown ... m Duration of Test ... hrs. (54)

Date of Test .../.../19 (57) Status ... (60)

Sampling Method ... Depth sample taken ... m (62)

Analysis Results: Field Conductivity ... µm @ ... °C

1250 (63) ~~Conductivity~~/Salinity (69) pH 7.5 (70)

Date 03 FEB 71 (73, 80) AMDEL No. ... Deptmtl. No. ...

02 (1) Security Rating ... (17) Bore Folder No. (18)

Permit No. (24) Reference No. (30)

ROUND HILL BORE HOLE (36, 50, 60, 69)

Aerial Photo No. (73, 80) Accuracy of Identification ...

Compiled ... Coding Check ...

N

Locality Plan

COMMENTS:

37

DATA FROM SML Commun., Envelope 1520, Dm 1158/70 VI

Sample Results

Uranium 6.37 ppb.

ORIGINAL DATA

Unit Number 0.6 (1 3)

Repeated on each card 16

Supply method ..... Method of Measure ..... (17 18)

Duration of Test ..... (19) hours

1st. Aquifer: Depth water cut ..... m SWD ..... m (23) M (28) (29)

Drawdown ..... m Supply ..... (34) (39)

Conductivity/Salinity ..... Aquifer developed? ..... (40) (46) (47) pH (48)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

2nd. Aquifer: Depth water cut ..... m SWD ..... m (51) M (56) (57)

Drawdown ..... m Supply ..... (62) (67)

Conductivity/Salinity ..... Aquifer developed? ..... (68) (74) (75) pH (76)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

0.6

3rd. Aquifer: Depth water cut ..... m SWD ..... m (23) M (28) (29)

Drawdown ..... m Supply ..... (34) (39)

Conductivity/Salinity ..... Aquifer developed? ..... (40) (46) (47) pH (48)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

4th. Aquifer: Depth water cut ..... m SWD ..... m (51) M (56) (57)

Drawdown ..... m Supply ..... (62) (67)

Conductivity/Salinity ..... Aquifer developed? ..... (68) (74) (75) pH (76)

Depth sample taken ..... m Sampling method ..... Analysis No. .....

DMC 128

FORM DP 18A

38

DEPARTMENT OF MINES AND ENERGY — SOUTH AUSTRALIA
WATER WELL DATA FIELD SHEET

01 Unit Number (1–16, Repeated on each card) Ref.No. .....

Hund. ..... (17) Sec./Town (20) Allot. (24) Bore (27)

Landholder ..... Address .....

Latitude/East (45) Longitude/North (52) Co-ord. Type (60) Zone Acc. (63) Basin .....

Situation of Well ..B.....

DRILLING DATA (See over for Aquifer Data)

03 (1) Driller(s) ..... Date Drilled: From ..... to (17)

..... Method used ..... (25)

Rig operated by ..... Purpose ..... Status ..... (29) (31) (33)

Depth Drilled ..... m Angle ..... Hole Diameter ..... (35) M (41) (42)

Casing Yes/No From ..... m to ..... m Diameter ..... Type ..... (43) (44)

From ..... m to ..... m Diameter ..... Type ..... (50) (56)

From ..... m to ..... m Diameter ..... Type ..... (57) (61)

Screen/Slotted Liner: Present? Yes/No (62) Core Library No (63) Logging by ..... (69) (70)

Screen/Slotted Liner Type ..... Material .....

Interval: From ..... m to ..... m (71) (76)

04 (1) Samples obtained ..... (17)

Analyses available ..... (21)

MOST RECENT DATA

07 (1) Total depth ..... m (17) M (23) Date (24) SWD ..... m (32) M (37) Date (38)

Supply: Flowing? ..... Flow Rate ..... Method measured ..... (46) (51)

Supply method ..... Type ..... Yield ..... Method measured ..... (52)

Power source ..... Intake depth ..... m Pump diameter ..... (53)

Column diameter ..... Drawdown ..... m Duration of Test ..... hrs. (54)

Date of Test .../.../19 (57) Status ..... (60)

Sampling Method ..... Depth sample taken ..... m (62)

Analysis Results: Field Conductivity ..... µm @ ..... °C

970 (63) ~~Conductivity~~/Salinity (69) pH 7.8 (70)

Date 03FEB971 (73–80) AMDEL No. ..... Deptmtl. No. .....

02 (1) Security Rating ..... (17) Bore Folder No. (18)

Permit No. (24) Reference No. (30)

B.H.P BORE HOLE (36–69)

Aerial Photo No. (73–80) Accuracy of Identification .....

Compiled ..... Coding Check .....

N

Locality Plan

FORM DP 18

COMMENTS:

DATA FROM SML Corunna, Envelope 1520, Dm 1158/70 VI

Sample Results

Uranium 0.47 ppb.

ORIGINAL DATA

Unit Number 0.6 (1 3)

Repeated on each card 16

Supply method ..... Method of Measure 17 18

Duration of Test ..... 19 hours

1st. Aquifer: Depth water cut ..... m SWD ..... m 23 M 28 29

Drawdown ..... m Supply 34 39

Conductivity/Salinity ..... Aquifer developed? ..... 40 46 47 pH 48

Depth sample taken ..... m Sampling method ..... Analysis No. .....

2nd. Aquifer: Depth water cut ..... m SWD ..... m 51 M 56 57

Drawdown ..... m Supply 62 67

Conductivity/Salinity ..... Aquifer developed? ..... 68 74 75 pH 76

Depth sample taken ..... m Sampling method ..... Analysis No. .....

0.6

3rd. Aquifer: Depth water cut ..... m SWD ..... m 23 M 28 29

Drawdown ..... m Supply 34 39

Conductivity/Salinity ..... Aquifer developed? ..... 40 46 47 pH 48

Depth sample taken ..... m Sampling method ..... Analysis No. .....

4th. Aquifer: Depth water cut ..... m SWD ..... m 51 M 56 57

Drawdown ..... m Supply 62 67

Conductivity/Salinity ..... Aquifer developed? ..... 68 74 75 pH 76

Depth sample taken ..... m Sampling method ..... Analysis No. .....

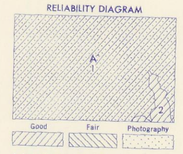
AUSTRALIA 1:250,000

PORT AUGUSTA

EDITION 1 - DNM

REFER TO THIS MAP AS: SI 53-4
EDITION 1
SERIES R 502

RELIABILITY DIAGRAM



A Aerial photography 1954, 1955 and 1965
1 Using graphical photogrammetric methods
2 Hydrographic charts

LOCATION DIAGRAM

TARCOOLA SH 53-16	KINGOONYA SH 53-11	ANDAMOOKA SH 53-12	COPLEY SH 54-9	FROME SH 54-10
CHILDARA SH 53-14	GAWLER SH 53-15	TORRENS SH 53-16	PARACHILNA SH 54-13	CURNAMONA SH 54-14
STREAKY BAY SI 53-7	YANDEA SI 53-8	PORT AUGUSTA SI 53-4	ORROROO SI 54-1	OLARY SH 54-2
ELLISTON SI 53-4	KIMBA SI 53-7	WHYALLA SI 53-8	BURRA SI 54-5	CHOWILLA SI 54-6
	LINCOLN SI 53-51	MAITLAND SI 53-12	ADELAIDE SI 54-9	RENMARK SI 54-10

LEGEND

(P.I.) indicates position doubtful
(I.S.) indicates photo interpretation doubtful

- Highway; built-up area
- Road, sealed surface first class; route marker
- Road, sealed surface second class; mileage
- Road, loose surface all weather first class
- Road, loose surface all weather second class
- Road, loose surface dry weather
- Road, unimproved earth
- Bridge road; bridge railway
- Railway multiple track
- Railway single track
- Light railway or tramway
- Station; siding; station with siding
- Telephone line; power transmission line
- Fence; stone wall
- Levee or dyke; quarry
- Mine; windpump; yard
- Building (s); church; school
- Post office; wireless transceiver; cemetery (P.O.) (W/T)
- Airport or airfield; landing ground
- Control point major, minor; astronomical
- Spot elevation in feet; accurate; approximate 750 ?750
- Bench mark; mud; gravel BM 750
- Sand; cliffs
- Sand ridges; sand dunes
- Relief shading
- Forest dense; forest medium
- Forest coniferous or pine plantation; scrub
- Vineyard; orchard or plantation
- Waterhole; water tank; dam; dry lake
- Lake, river or stream perennial
- Lake, river or stream intermittent
- Dam or weir; falls; rapids
- Drain or ditch perennial, intermittent
- Spring perennial, intermittent, ricefields
- Marsh or swamp; mangroves
- Seaplane anchorage; seaplane base
- Breakwater, pier, dock or wharf (LWM)
- Fathom line; low water mark; lighthouse
- Wreck sunken, exposed; vessel anchorage
- Rocks submerged, bare or awash
- Reef, rocky or coral

EDITION 1 - DNM
SERIES R 502

NMP/65/095

Prepared under the direction of the Minister for National Development, by the Division of National Mapping as part of the national mapping programme. Manuscript prepared in 1965 by the Department of Mines, South Australia, from 1949 and 1955 aerial photography. Minor amendments by the Division of National Mapping in 1966 from 1965 aerial photography and the current hydrographic chart. Distributed to the Defence Services by the Royal Australian Survey Corps and to all other map users by the Department of National Development.

Scale 1:250,000

5 0 5 10 15 20 25 Statute Miles
5 0 5 10 115 20 Nautical Miles
10,000 0 10,000 20,000 30,000 Yards
5 0 5 10 15 20 25 Kilometres

ELEVATIONS SHOWN IN FEET
VERTICAL DATUM IS BASED ON MEAN SEA LEVEL

TRANSVERSE MERCATOR PROJECTION
HORIZONTAL DATUM IS BASED ON MEAN ASTRONOMICAL DETERMINATIONS

BLACK NUMBERED LINES INDICATE THE 10,000 YARD TRANSVERSE MERCATOR GRID, ZONE 5 (AUSTRALIA SERIES) CLARKE 1858 SPHEROID
THE LAST FOUR DIGITS OF THE GRID NUMBERS ARE OMITTED

1965 MAGNETIC DECLINATION FOR THIS SHEET VARIES FROM 6°30' EASTERLY FOR THE CENTRE OF THE WEST EDGE TO 7°00' EASTERLY FOR THE CENTRE OF THE EAST EDGE. MEAN ANNUAL CHANGE IS 03' EASTERLY.

NISSHO-IWAI Co.(Aust)Pty.
SML. 498 Corunna

Locality Map of
S.M.L. 498

Fig. 1

AUTHRS & DRAFTED	GEOLOGICAL SECTION of PNC for NISSHO-IWAI	CHECKED S.ARTANI	PLAN No. C 001
		DATE JAN 1971	

1520

TO GIVE A GRID REFERENCE ON THIS SHEET
Pay no attention to the smaller co-ordinate figures at the corners and in the margins - they are for finding full co-ordinates
PAY ATTENTION TO LARGER MARGINAL FIGURES AND TO THOSE PRINTED ON THE FACE OF THE MAP

POINT • "Myall Creek"

East		North	
Take west edge of square in which point lies and read the figures printed opposite this line (on north or south margin) or on the line itself (on the face of the map)	53	Take south edge of square in which point lies and read the figures printed opposite this line (on east or west margin) or on the line itself (on the face of the map)	97
Estimate tenths Eastward	5	Estimate tenths Northward	9
	535		979

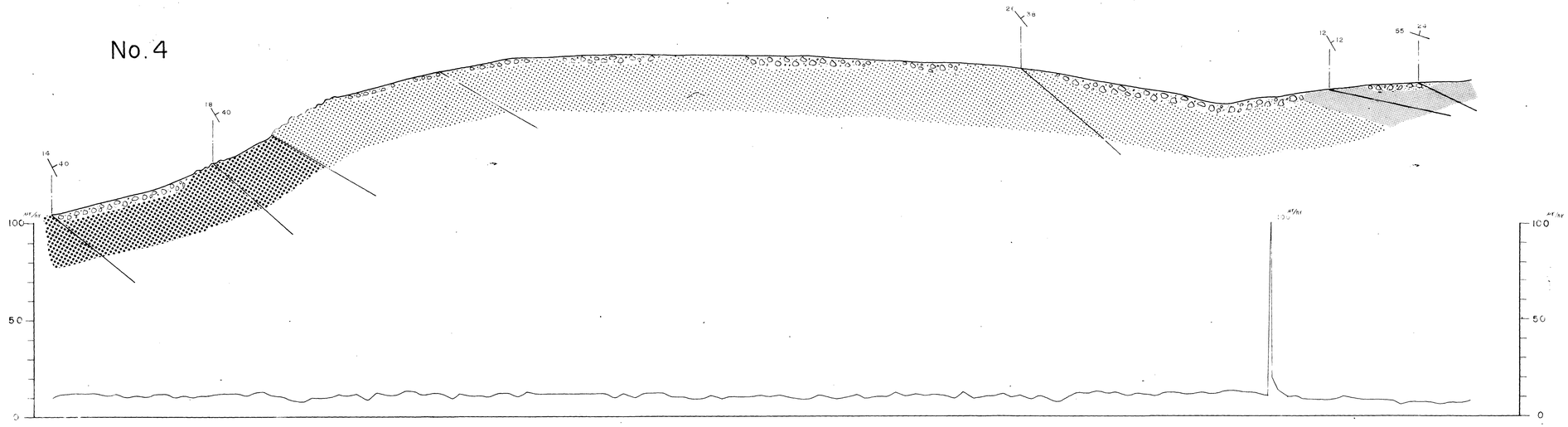
REFERENCE 535979

Unit ..... Yard
Square 10,000
Reference to nearest 1,000
Nearest similar reference distance ..... 300 miles

PORT AUGUSTA
SOUTH AUSTRALIA

1520 - 4

No.4



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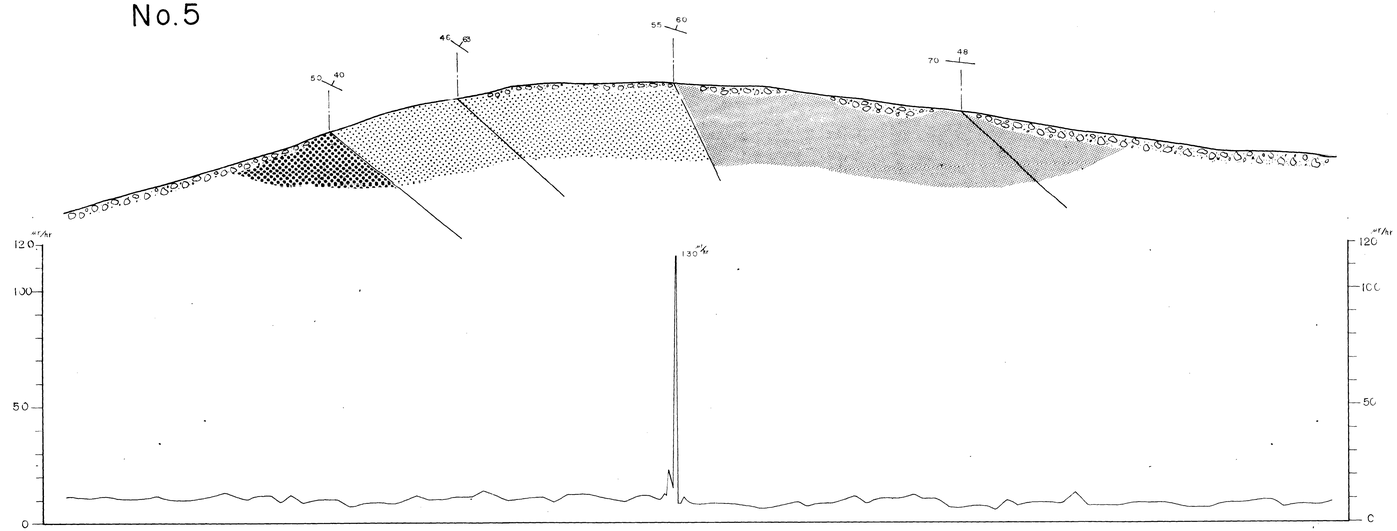

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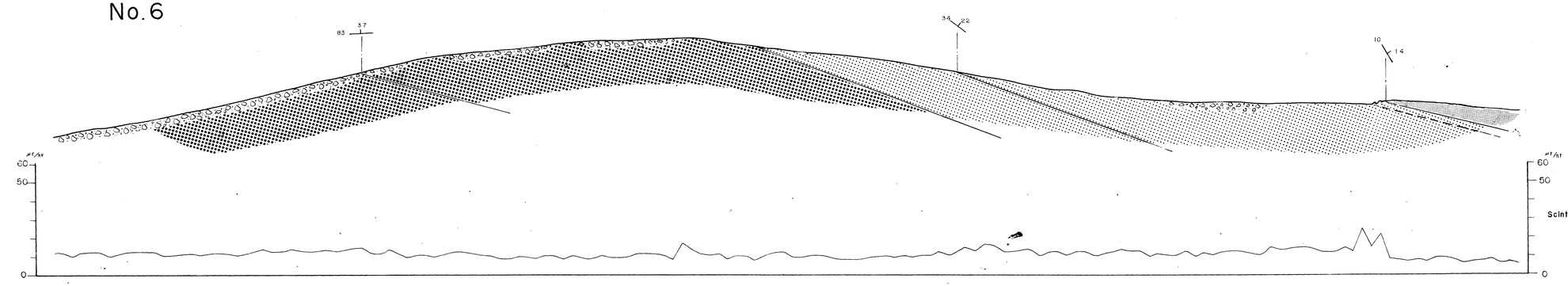


Debris

Quartzite

Grey Sandstone

Red Sandstone

Scale In Meters

0 50 100 150

Scintillometer
J.R.C. ALOKA
T.C.S. 122 B

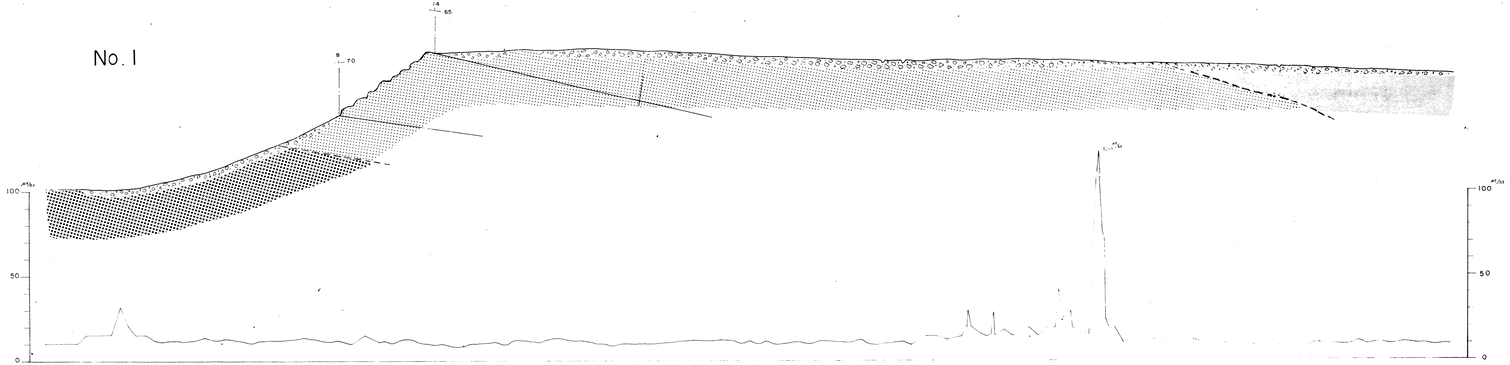
NISSHO-IWAI Co.(Aust) Pty. Ltd.

SML. 498 Corunna

CROSS SECTION SHOWING
GROUND RADIOMETRIC ANOMALIES
LINE 4-6

AUTHORS	GEOLOGICAL SECTION of PNC for NISSHO-IWAI	CHECKED S ARATANI	PLAN No. C 402
DRAFTED		DATE JAN. 1971	

No. 1



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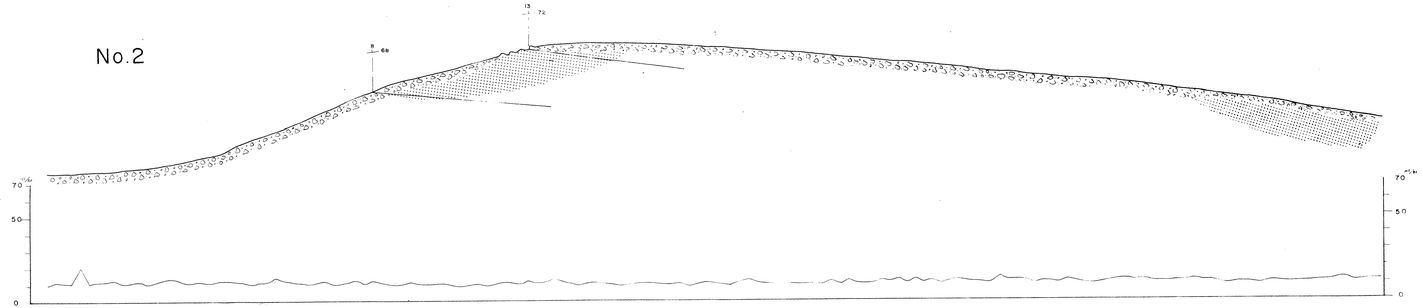

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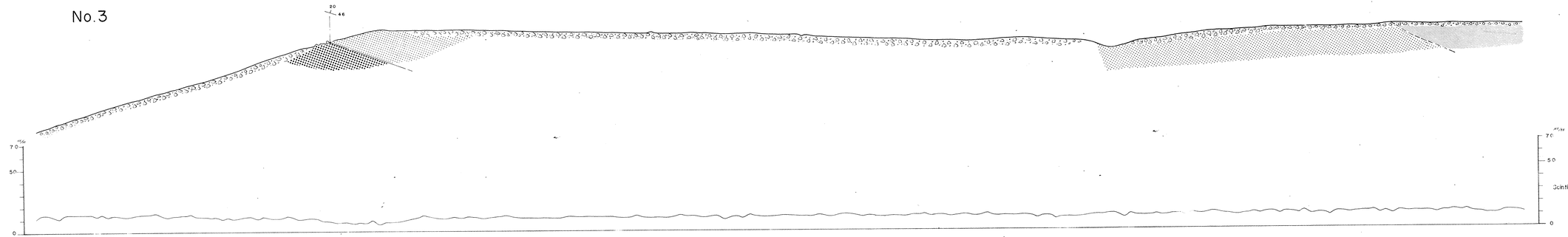


Debris

Quartzite

Grey Sandstone

Red Sandstone

Scale In Meters

0 50 100 150

Scintillometer
JRC. ALOKA
TCS 122B

NISSHO-IWAI Co.(Aust) Pty. Ltd.

SML. 498 Corunna

CROSS SECTION SHOWING
GROUND RADIOMETRIC ANOMALIES
LINE 1 – 3

AUTHORS & DRAFTED GEOLOGICAL SECTION of NISSHO-IWAI	CHECKED S. ARATANI	PLAN No. C 401
	DATE JAN. 1971	

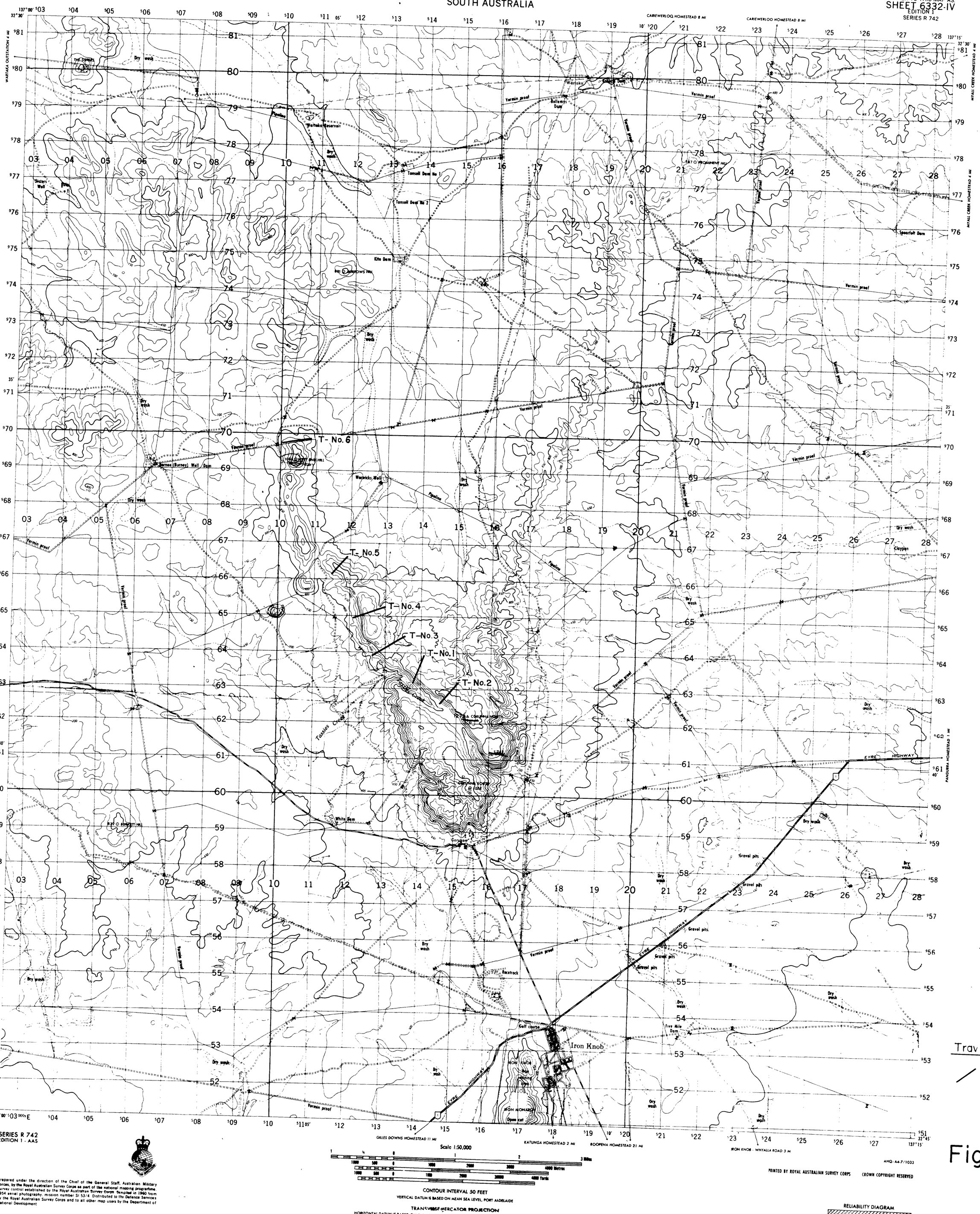
Locality Map of Surveying Lines

AUSTRALIA 1:50,000

CORUNNA
SOUTH AUSTRALIA

EDITION 1 - AAS

REFER TO THIS MAP AS:
SHEET 6332-IV
EDITION 1
SERIES R 742



Traverse Lines

T-No.1

Fig. 4

SERIES R 742
EDITION 1 - AAS

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Scale 1:50,000

CONTOUR INTERVAL 50 FEET
VERTICAL DATUM IS BASED ON MEAN SEA LEVEL, PORT ADELAIDE

TRANSVERSE MERCATOR PROJECTION
HORIZONTAL DATUM IS BASED ON SYDNEY OBSERVATORY, LATITUDE 33°51'41.10"S LONGITUDE 151°12'17.85"E

BLACK NUMBERED LINES INDICATE THE 1,000 YARD TRANSVERSE MERCATOR GRID, ZONE 5 (AUSTRALIA SERIES), CLARKE 1858 SPHEROID
THE LAST THREE DIGITS OF THE GRID NUMBERS ARE OMITTED

AHQ/A4-7/1033

PRINTED BY ROYAL AUSTRALIAN SURVEY CORPS

LEGEND

- Built up area
- Sealed surface first class highway
- Sealed surface first class road with route marker (30)
- Sealed surface second class road with bridge
- Loose surface all weather road with embankment
- Loose surface dry weather road with cutting
- Unimproved earth road with gate, cattle grid
- Track, foot or pack with footbridge
- Railway multiple track
- Railway single track
- Railway station, siding, station with siding
- Light railway or tramway with turntable
- Railway tunnel, bridge
- Telephone or telegraph, power transmission lines
- Levee or dyke, quarry
- Building, school, post office, church
- Windpump, mine, yards, cemetery
- Horizontal control point major, minor
- Benchmark, spot elevation (BM · 855 · 903)
- Wall, fence
- Mud, sand
- Sand dunes, ridges
- Contours, with contour value
- Auxiliary contour
- Depression contours
- Cliffs high, low
- Forest dense, medium
- Forest coniferous, pine plantation
- Scrub, tropical grass
- Orchard or plantation, vineyard
- Marsh or swamp
- Mangroves
- Lake or pond perennial, intermittent
- Dry lake or claypan, drain or ditch
- River or stream, perennial
- River or stream, intermittent
- Lock large, small, sluice gate
- Well, spring, perennial and intermittent
- Dam, tank, waterhole
- Vessel anchorage, lighthouse
- Breakwater, pier or dock or wharf
- Wreck exposed, sunken
- Danger area with soundings
- Rocks or reef submerged
- Rocks or reef, bare or awash

LOCATION DIAGRAM

GRID REFERENCE

TO GIVE A GRID REFERENCE ON THIS SHEET
Pay no attention to the smaller co-ordinate figures at the corners and in the margins - they are for finding full co-ordinates
PAY ATTENTION TO LARGER MARGINAL FIGURES AND TO THOSE PRINTED ON THE FACE OF THE MAP

POINT 1275 △ CORUNNA NORTH

East		North	
Take west edge of square in which point lies and read the figures printed opposite this line (on north or south margin) or on the line itself (on the face of the map)	15	Take south edge of square in which point lies and read the figures printed opposite this line (on east or west margin) or on the line itself (on the face of the map)	62
Estimate tenths Eastward	4	Estimate tenths Northward	2
	154		622

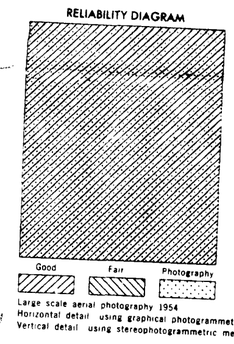
REFERENCE 154622

Unit	Yard
Square	1000
Reference to nearest	100
Nearest similar reference distant	60 miles

GN
7°00'
OR
124.4 MILS

APPROXIMATE MAGNETIC DECLINATION 1960 AT THE CENTRE OF THE SHEET FOR THE TRANSVERSE MERCATOR GRID, ZONE 5 ANNUAL CHANGE IS 03' EASTERLY.

RELIABILITY DIAGRAM



Large scale aerial photography 1954
Horizontal detail using graphical photogrammetric method.
Vertical detail using stereophotogrammetric methods

CORUNNA, AUSTRALIA

NISSHO-IWAI Co.(Aust) Pty. Ltd.

SML.498 Corunna
Locality Map of Surveying Lines

AUTHORS & DRAFTED	GEOLOGICAL SECTION of PNG for NISSHO-IWAI	CHECKED. S.ARATNI
		DATE JAN 1971
		PLAN No. C 403

1520

1520 - 7

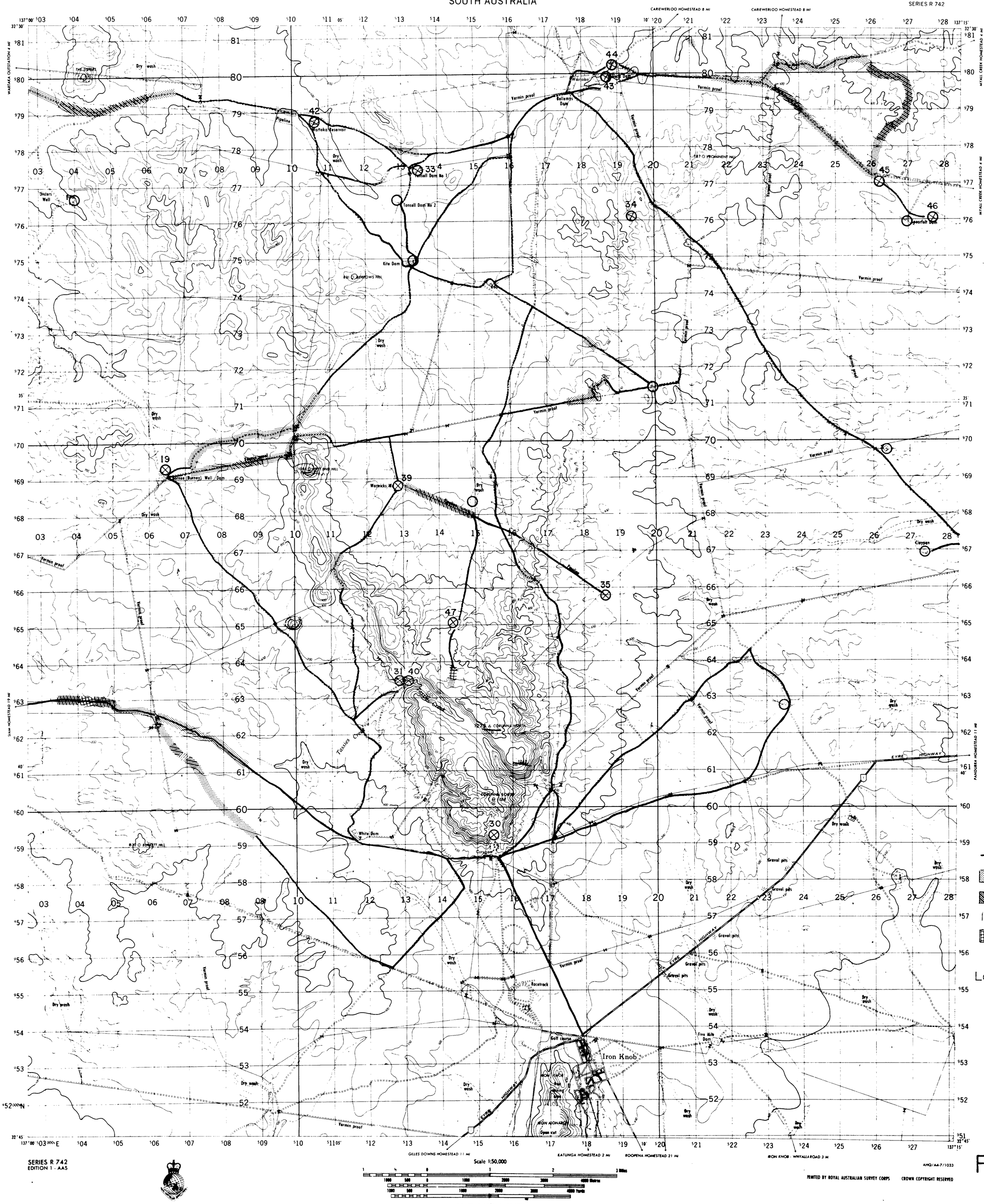
Route Map of Carborne Radiometric Survey & Locality Map of Water Samples

AUSTRALIA 1:50,000

CORUNNA
SOUTH AUSTRALIA

EDITION 1 - AAS

REFER TO THIS MAP AS:
SHEET 6332-IV
EDITION 1
SERIES R 742



Carborned Route

- Less than 2000 C.P.M
- 2000 ~ 3000 C.P.M
- 3000 ~ 4000 C.P.M
- More than 4000 C.P.M
- Radioactive Auomalous Line

Locality Map of Water Samples

20 ⊗ Sample No.

○ Dry Dam or Well

Fig. 3

SERIES R 742
EDITION 1 - AAS

Scale 1:50,000

1 ½ 0 1 2 3 Miles
1000 500 0 1000 2000 3000 4000 Metres
1000 500 0 1000 2000 3000 4000 Yards

AMQ/A4-7/1033

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CONTOUR INTERVAL 50 FEET

VERTICAL DATUM IS BASED ON MEAN SEA LEVEL, PORT ADELAIDE

TRANSVERSE MERCATOR PROJECTION

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BLACK NUMBERED LINES INDICATE THE 1,000 YARD TRANSVERSE MERCATOR GRID, ZONE 5 (AUSTRALIA SERIES), CLARKE 1858 SPHEROID

THE LAST THREE DIGITS OF THE GRID NUMBERS ARE OMITTED

LEGEND

Built up area; Sealed surface first class highway; Sealed surface first class road with route marker; Sealed surface second class road with bridge; Loose surface all weather road with embankment; Loose surface dry weather road with cutting; Unimproved earth road with gate, cattle grid; Track, foot or pack with footbridge; Railway multiple track; Railway single track; Railway station, siding, station with siding; Light railway or tramway with turntable; Railway tunnel, bridge; Telephone or telegraph, power transmission lines; Levee or dyke, quarry

Building, school, post office, church; Windpump, mine, yards, cemetery; Horizontal control point major, minor; Benchmark, spot elevation (BM · 855 · 903); Wall fence; Mud, sand; Sand dunes, ridges; Contours, with contour value; Auxiliary contour; Depression contours; Cliffs high, low; Forest dense, medium; Forest coniferous, pine plantation; Scrub, tropical grass; Orchard or plantation, vineyard

Marsh or swamp; Mangroves; Lake or pond perennial, intermittent; Dry lake or claypan, drain or ditch; River or stream, perennial; River or stream, intermittent; Lock large, small, sluice gate; Well, spring, perennial and intermittent; Dam, tank, waterhole; Vessel anchorage, lighthouse; Breakwater, pier or dock or wharf; Wreck exposed, sunken; Danger area with soundings; Rocks or reef submerged; Rocks or reef, bare or awash

LOCATION DIAGRAM

GRID REFERENCE

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POINT 1275 Δ CORUNNA NORTH

East		North	
Take west edge of square in which point lies and read the figures printed opposite this line (on northing or south margin) or on the line itself (on the face of the map)	15	Take south edge of square in which point lies and read the figures printed opposite this line (on east or west margin) or on the line itself (on the face of the map)	62
Estimate tenths Eastward	4	Estimate tenths Northward	7
	154		622

REFERENCE 154622

Unit ____ Yard
Square ____ 1000
Reference to nearest ____ 100
Nearest similar reference distant ____ 60 miles

APPROXIMATE MAGNETIC DECLINATION 1960 AT THE CENTRE OF THE SHEET FOR THE TRANSVERSE MERCATOR GRID, ZONE 5. ANNUAL CHANGE IS 03' EASTERLY.

GN 7°00' OR 124.4 MILS

RELIABILITY DIAGRAM

Good Fair Photography

Large scale aerial photography 1954
Horizontal detail using graphical photogrammetric methods
Vertical detail using stereophotogrammetric methods

NISSHO-IWAI Co.(Aust.) Pty. Ltd

SML. 498 Corunna

ROUTE MAP of CARBORNE RADIOMETRIC SURVEY & LOCALITY MAP of WATER SAMPLES

AUTHORS & DRAFIED	GEOLOGICAL SECTION of PNC for NISSHO-IWAI	CHECKED S.ARTANI	PLAN No.
		DATE JAN 1971	C 301

1520

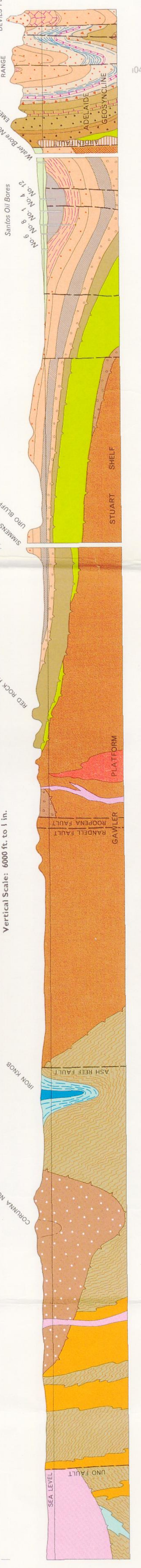
1520-8

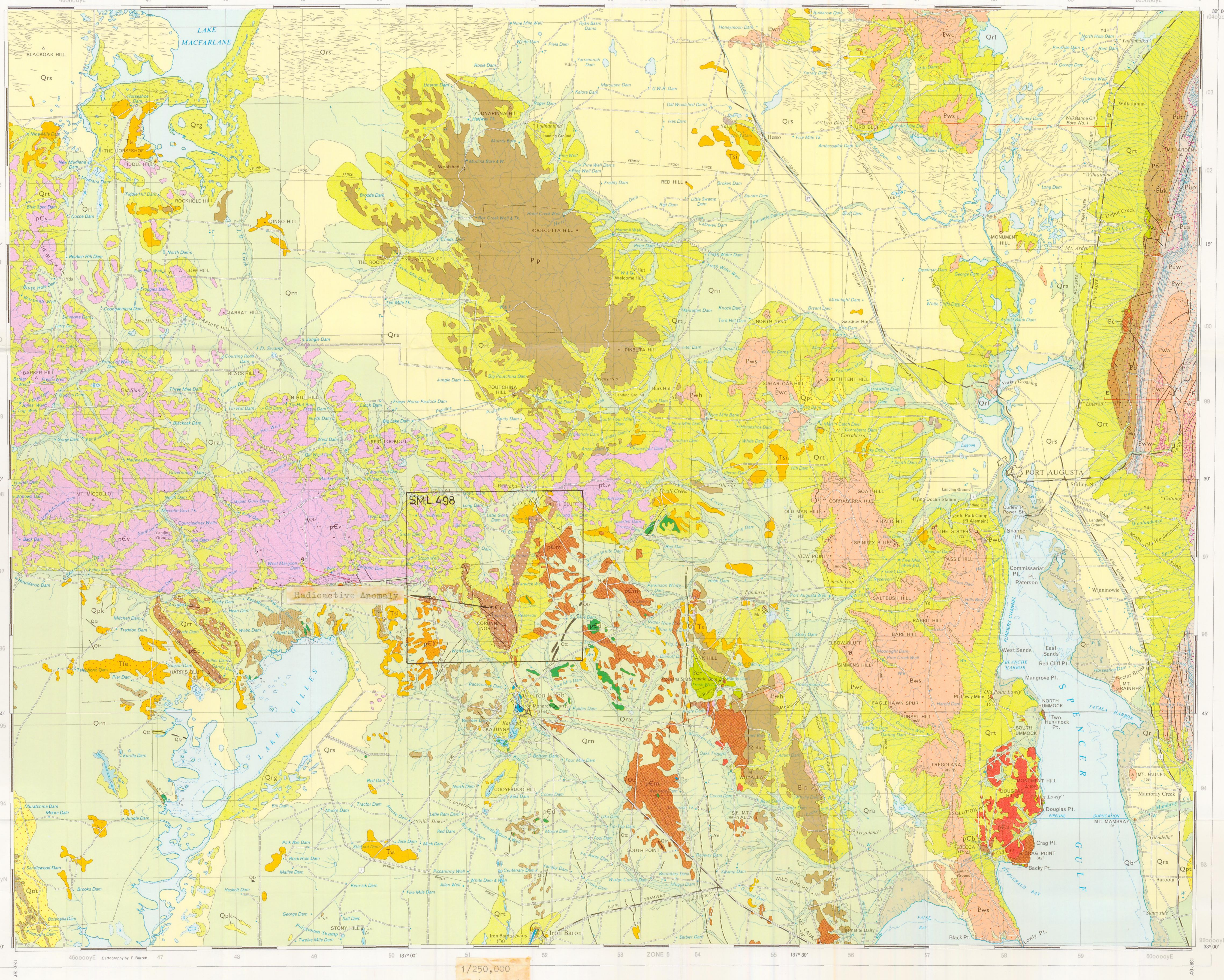
PORT AUGUSTA

GEOLOGICAL SURVEY OF SOUTH AUSTRALIA
DEPARTMENT OF MINES ADELAIDE

AUSTRALIA 1:250,000

S.A. GEOLOGICAL ATLAS SERIES SHEET SI 53-4 ZONE 5





1/250,000
Port Augasta

FIRST EDITION 1968

REFERENCE

CAINOZOIC

QUATERNARY — RECENT

- Qb — White sand of the coastal dunes (SEMAPHORE SAND), modern beach sand and gravel.
- Qrg — Sand of the gypsum dunes: Aeolian beds mapped with YAMBA FORMATION.
- Qra — Fluviatile sands and gravels of the modern drainage channels.
- Qrs — Sand sheets and sief dunes (red-brown FULHAM SAND and pale-yellow MOLINEAUX SAND equivalents).
- Qr — ST. KILDA FORMATION: Sands, shelly silts and clays of the littoral lagoons and mangrove swamps.
- Qrl — YAMBA FORMATION: (Lacustrine beds). Flour gypsum of the samphire flats.
- Qrl — Grey plastic gypsiferous muds.

QUATERNARY — PLEISTOCENE

- Qrn — Soil mantles, including gypsiferous LOVEDAY SOIL with a characteristic soft platy and nodular carbonate horizon.
- Qrt — POORAKA FORMATION: Gravels, sands and clayey sands with clay lenses. Overlies lower Pleistocene HINDMARSH CLAY in many places.
- Qpk — Calcrete in BAKARA SOIL with RIPON CALCRETE at the base.
- Qpt — TELFORD GRAVEL: Dissected high-level gravels, calcreted in places.

TERTIARY

- Tfe — Laterite as cappings and exposed on low rises.
- Tsi — Silcrete cappings, thin boulder beds and sandstones containing leaf impressions.

SEQUENCE IN THE ADELAIDE GEOSYNCLINE EAST OF PORT AUGUSTA

UPPER PROTEROZOIC — ADELAIDE SYSTEM

MARINOAN — WILPENA GROUP

- Ꝑwp — POUND QUARTZITE: White quartzite and underlying red sandstones of Devils Peak. Top not exposed.
- Ꝑww — WONOKA FORMATION: Grey flaggy calcareous siltstones.
- Ꝑwb — BUNYEROO FORMATION: Purple and grey-green shales.
- Ꝑwa — A.B.C. RANGE QUARTZITE: Thin bedded, ripple marked quartzite with silty bands and heavy mineral laminae.
- Ꝑwr — BRACHINA FORMATION: Red and green shales, siltstones.
- Ꝑwn — NUCCALEENA FORMATION: Lenticular pink dolomite.

?STURTIAN — UMBERATANA GROUP

- Ꝑuw — WILLOCHRA FORMATION: Upper unit: Rippled sandstones, siltstones, gritty limestone. Lower unit: Red-grey calcareous siltstones, mud cracked.
- Ꝑuo — BRIGHTON LIMESTONE EQUIVALENT: Grey massive dolomite.
- Ꝑut — TAPLEY HILL FORMATION: Green calcareous siltstone. TINDELPINA SHALE MEMBER: Finely laminated dolomitic shale.
- Ꝑua — APPILA TILLITE EQUIVALENT: Boulder beds, quartzite, siltstone.

TORRENSIAN — BURRA GROUP

- Ꝑb — Unnamed dolomitic shales and quartzite beds.
- Ꝑbk — SKILLOGALEE DOLOMITE: Laminated dark grey and paler dolomite, chert, grey siltstone, feldspathic quartzite; laminated magnesite beds, magnesite conglomerate.
- Ꝑbr — RHYNIE SANDSTONE: Pink and pale grey feldspathic quartzite, laminated and flaggy; minor pink and grey siltstone pebbly in places near base; ripple marks, cross-bedding, heavy mineral laminae, mud cracks (EMEROO QUARTZITE, includes NELSHABY SANDSTONE, WIRRABARA FORMATION.)

?WILLOURAN — ?CALLANNA BEDS

- Ꝑc — Quartzite and siltstone; flaggy laminated, pinkish grey and greyish-red: ripple marks, cross-bedding, heavy mineral laminae and salt casts.
- Ꝑc — Conglomerate, pebbly quartzite; rounded pinkish quartzite pebbles in arkosic matrix, some trachyte pebbles. Heavy mineral laminae, cross-bedding. Unconformity.

WILLOURAN — CALLANNA BEDS

- Ꝑcr — ROOPENA VOLCANICS EQUIVALENT at Depot Creek: Purple and green amygdaloidal trachyte, minor siltstone and pyroclastic lenticles. Thin grit at base with trachyte pebbles.
- Ꝑc — Reddish siltstone, sandstone, dolomite, silty dolomite; laminated, ripple marks, mud cracks.
- Ꝑc — Diapiric breccia with carbonate matrix; rafts of contorted siltstones, sandstones and dolomites.

UNITS OF THE STUART SHELF AND GAWLER PLATFORM

PALAEOZOIC — CAMBRIAN — LOWER — HAWKER GROUP

- Ꞓh — (Section only) PARARA, KULPARA LIMESTONES and PARACHILNA FORMATION EQUIVALENTS from the Wilkatana bores. Unconformity.

PROTEROZOIC — ADELAIDE SYSTEM — MARINOAN — WILPENA GROUP EQUIVALENT

- Ꝑws — TENT HILL FORMATION: Equivalent of A.B.C. RANGE QUARTZITE and BRACHINA FORMATION. SIMMENS QUARTZITE MEMBER: Dense white quartzite. (ARCOONA QUARTZITE MEMBER.)
- Ꝑwc — CORRABERRA SANDSTONE MEMBER: Red-brown micaceous sandstone.
- Ꝑwt — TREGOLANA SHALE MEMBER: Purple and brown sandy siltstones and shales. Equivalent of WOOMERA SHALE.
- Ꝑwh — WHYALLA SANDSTONE MEMBER: Poorly outcropping basal grits and sandstones with abundant cobbles of Pandurra Formation. Unconformity.
- Ꝑ-p — PANDURRA FORMATION: Medium-grained and gritty red sandstones, cross-bedded, conglomeratic near base. Unconformity.

WILLOURAN

- Ꝑcr — ROOPENA VOLCANICS: Purple and grey-green amygdaloidal trachytes, basalt and andesite with minor diorite and also altered amygdaloidal flow rocks of Two Hummock and Backy Point. Equivalents of volcanics at Depot Creek.
- Ꝑcb — BACKY POINT FORMATION: Thin bedded sandstone with cobbles, unconformable on MOONABIE FORMATION. Unconformity.

CARPENTARIAN

- pꞒu — CULTANA GRANITIC COMPLEX: Granite with porphyritic and granophyric phases. Intrudes MOONABIE FORMATION. Overlain by BACKY POINT FORMATION in Cultana area.
- pꞒv — GAWLER RANGE VOLCANICS: Quartz-feldspar porphyry, columnar jointed rhyolite, rhyodacite, dacite and welded vitric and lithic tuffs. Intruding into and over-lying CORUNNA CONGLOMERATE.
- pꞒc — CORUNNA CONGLOMERATE: Conglomerate, sandstone, brown and dark grey siltstone, dolomite, crystal tuff. Unconformity.
- pꞒb — BURKITT GRANITE: Massive hornblende granite. Overlain by CORUNNA CONGLOMERATE.
- pꞒd — Basic intrusive. Amphibolite, serpentine, dolerite, gabbro in sills, dykes and plugs intruding OLDER PRECAMBRIAN and MOONABIE FORMATION.
- pꞒm — MOONABIE FORMATION: Indurated dark-grey quartzite with scattered rhyolite pebbles. Commonly a granular greywacke. Gently folded. Inferred regional unconformity.

LOWER PROTEROZOIC — CLEVE METAMORPHICS

- Bands and bodies of granite and pegmatite associated with gneisses (including FLINDERS GNEISS), developed in Lower Proterozoic sediments during early Carpentarian metamorphic event.
- WARROW QUARTZITE: Coarse recrystallized glassy quartzite and quartz-sericitic schists.
- MIDDLEBACK GROUP: Jaspilites (associated with iron ore bodies in Middleback Ranges.)
- Undifferentiated schist, dolomite, chert and amphibolites (including COOKS GAP SCHIST and MIDDLEBACK NORTH DOLOMITE.)
- Lower Proterozoic rock units, largely converted to early Carpentarian gneisses and now represented by local relict schist and amphibolite bodies (not differentiated on map.)

GEOLOGICAL BOUNDARIES
FAULTS
FOLDS
PLUNGE OF DRAG FOLD
BEDDING
INCLINED
VERTICAL
HORIZONTAL
OVERTURNED
TREND OF BEDDING
TOP OF BED, CROSS-BEDDING
FOLIATION INCLINED
FOLIATION VERTICAL
FOLIATION WITH PLUNGE OF LINEATION
JOINTING
INCLINED
VERTICAL
FLOW BANDING
TYPE SECTION
PLANT FOSSIL LOCALITY
MAIN ROAD
SECONDARY ROAD
TRACK
NATIONAL ROUTE NUMBER
RAILWAY
BOUNDARY FENCE
TRIANGULATION STATION
EPHEMERAL STREAM
LAKE
SWAMP
MANGROVES
WATER FEATURES
BORE
WATER HOLE — W.H.
WELL — W
EARTH TANK OR DAM
QUARRY
MINE

BARYTES	Ba	COPPER	Cu
IRON	Fe	MANGANESE	Mn
QUARTZ	Qtz	HEMATITE ORE (HIGH GRADE)	

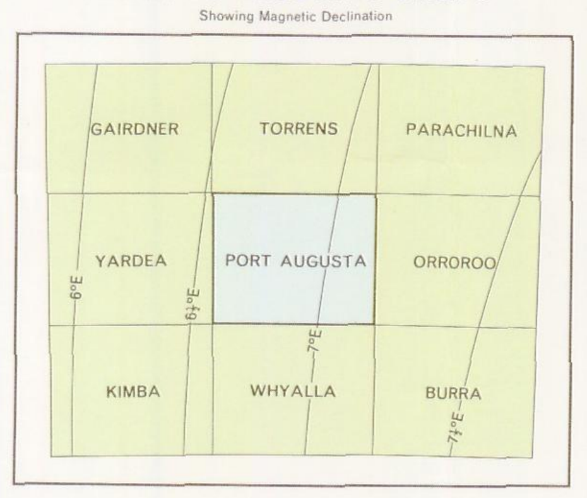
PORT AUGUSTA
SHEET SI 53-4

Geological compilation and revision by C. R. Dalgarno, M.Sc., J. E. Johnson, B. G. Forbes, Ph.D., B. P. Thomson, M.Sc., from previously published Atlas Series Maps and unpublished Geological Survey regional mapping.
Supervising Geologist, Regional Surveys Division, B. P. Thomson, M.Sc.
Map preparation by Cartographic Section, Department of Mines, S.A.
Compiled under the direction of – T. A. Barnes, Government Geologist, Director of Mines.

Issued under the authority of the Honourable R. C. De Garis, Minister of Mines.
Published 1968

INDEX TO ADJOINING SHEETS

Showing Magnetic Declination



Copies of this map may be obtained from the Geological Survey of South Australia, Department of Mines, Adelaide, or the Bureau of Mineral Resources, Geology and Geophysics, Canberra, A.C.T. Printed for the Geological Survey of South Australia as a contribution to the Geological Map Series of the Commonwealth.

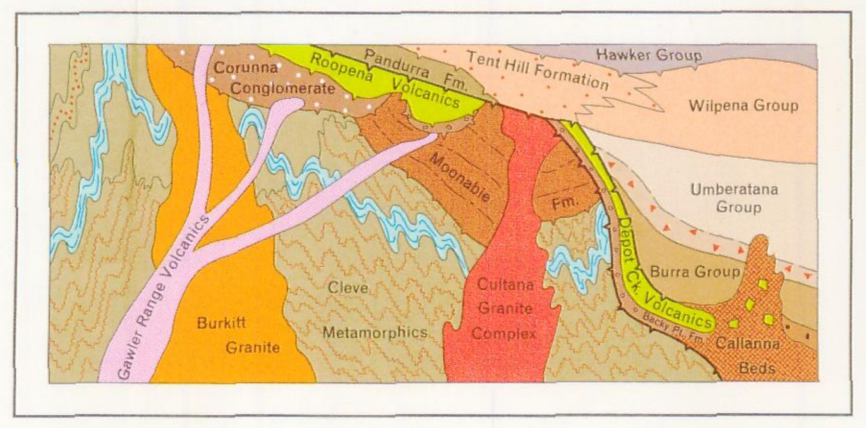
SCALE

MILES 2 1 0 2 4 6 8 10 12 14 16 18 20 MILES

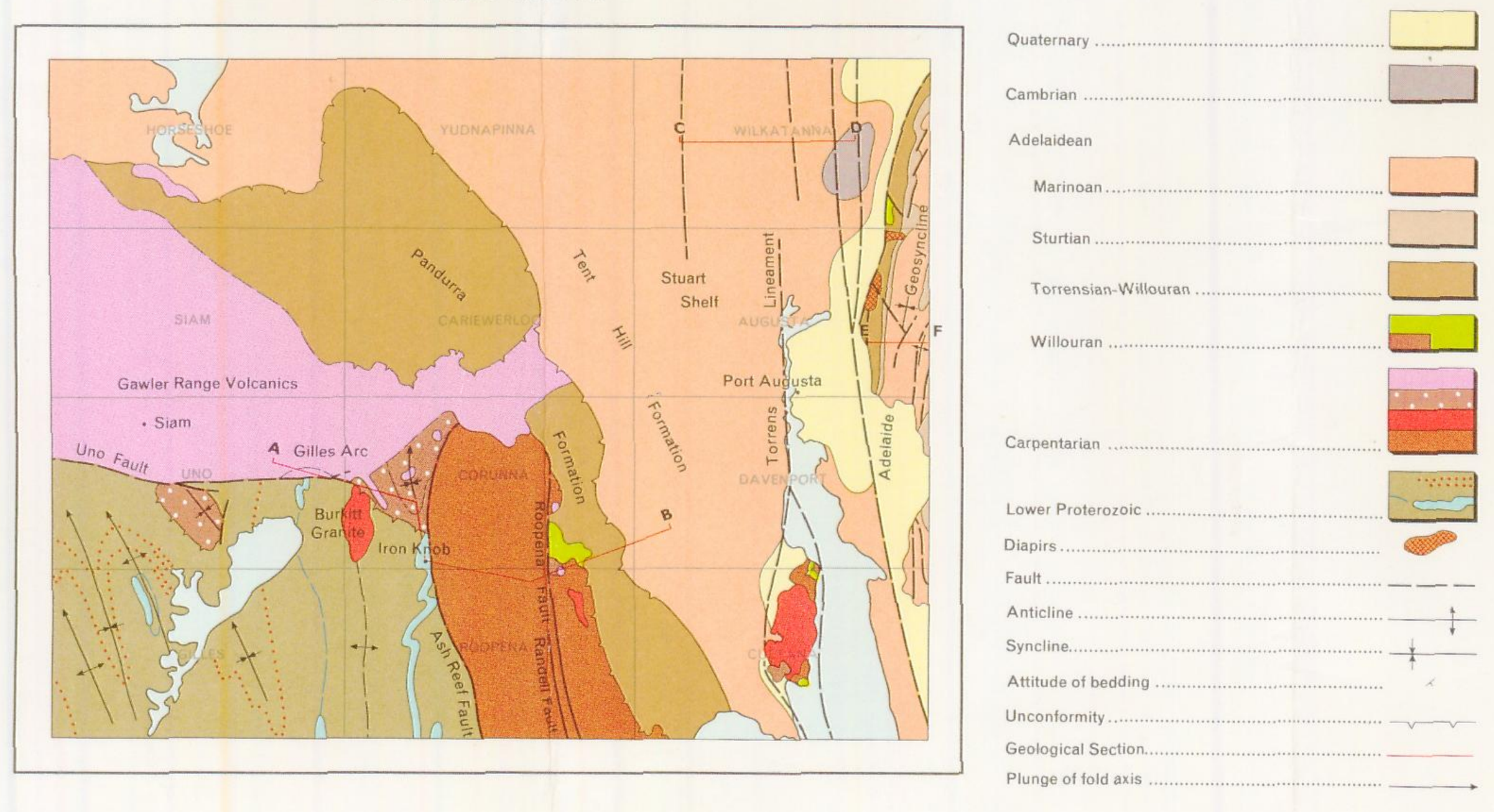
KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

H. J. WALL, GOVERNMENT PHOTOLITHOGRAPHER, ADELAIDE

ROCK RELATION DIAGRAM



TECTONIC SKETCH



1520-9

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SECOND QUARTERLY REPORT

O N

SPECIAL MINING LEASE NO. 498

IN THE CORUNNA AREA

SOUTH AUSTRALIA

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

May 5, 1971

C O N T E N T S

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ILLUSTRATIONS

ABSTRACT

Following the investigation of the first quarter, the second quarter investigation, led by Mr. K. HIRAKAWA, was conducted intensively in the area of the Special Mining Lease No. 498 (Corunna Area).

During this period as in the previous one, the investigation was concentrated mainly in the traverse geologic and radiometric survey in the eastern wing of the Corunna Range for the purpose of determining the geologic structure in this area. During this survey, a systematic sampling and chemical analysis of the stream sediments was performed as well as chemical analysis of the rock samples collected from the lease area, and the mineralogical research, which were carried out by P.N.C. laboratory Japan.

As the result, it has been recognized that the radioactive anomaly on the surface continues for a distance of 12km, and also has made clear the pattern of the geologic structure in this area.

On the other hand, it has been deduced from the results of the mineralogical research that the genesis of ore deposits in the Corunna Area and the Uno Range Area seems nearly identical.

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GEOLOGIC AND RADIOMETRIC SURVEY

Following the preceding investigation conducted in the western wing of the southern part of the Corunna Range during the first quarter, a geological mapping and a radiometric surveying were performed having established four traverse lines running a distance of 4km in the eastern wing of the same area (Refer to Fig. 1 and Fig. 3).

The results of the survey indicated the similar geological structure as in the case of the western wing, and the presence of radioactive anomalies running throughout the area (0.10-0.19mr/h). Also the radioactive detection which was conducted as part of the survey to determine the geologic pattern (as later described), discovered the presence of numerous anomalies, including maximum reading of 0.6mr/h.

The traverse radiometric survey and geologic surveying conducted during the preceding and the present terms have revealed the following facts:

(1) The existence of radioactive anomalies has been traced in the uppermost part of the grey sandstone member as well as in the pebbly sandstone to granule conglomerate.

(2) The radioactive anomalies have been traced approximately for a distance of 12km, and the maximum counting was 0.6mr/h, and the average 0.1mr/h.

(3) The horizon of the anomalous zone seems more or less correlative with that of Uno Area.

(4) The thickness of the anomalous zone in the range is of 0.5m to 1m.

(5) Two anomalous layers have been partly recognized at inverval of 2m to 3m.

(6) Comparing with the Uno Area, the layer of the grey sandstone member is generally thicker than in the Uno Area with the maximum thickness of about 300m.

(7) The degree of radioactivity in the anomalous zone shows a tendency of decreasing towards the northern part of the area.

(8) In general, the anomalous area has staining of hematite showing reddish brown color, or with white clayey layers.

GEOLOGICAL STRUCTURE OF THE CORUNNA RANGE

As above mentioned traverse line surveying had left unsolved various complicated and ambiguous points relating to the geological structure of the Corunna Range, an additional survey concentrating in the further determination of the geological structure and formation of the Corunna Range was performed. As the result, the following features have been made clear: (Refer to Fig. 2).

(1) It has been deduced that there exists a synclinal folding structure with an axis running NNW - SSE in the eastern wing of the Range. This synclinal folding showing a steep dip in the eastern wing and a low dip in the western wing side, forming in general an asymmetrical synclinal folding structure shooting to the north direction, and whereby, the similarity with the structure of the Uno Area could be noticed.

(2) It has been deduced that there exist three faults which cut the synclinal folding, and also that it was these faults which made the geologic structure of the Range so complex.

East Side Fault: This fault runs along the eastern part of the Range in the direction of N - S downthrowing at the eastern part, showing a normal fault with 100m displacement.

Tassies Creak Fault: This fault runs along the southern part of the Range in the direction of NW - SE downthrowing at the eastern part, showing a normal fault with 200m displacement.

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West End Fault: This fault runs oblique through the western wing downthrowing at the eastern part, showing a normal fault with 100m displacement.

There was neither distribution of quartzite member found in the southside of the fault nor radioactive anomaly. Consequently, the possibility of existence of any ore deposits in the basin area between the ranges forming V-shape will be the most important problem in the future. However, as there are many undetermined facts still remaining as to the conditions, scale and magnitude of the Gawler Range Volcanics occurred in this area, it will be necessary to conduct further prospecting work to solve the problem.

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CHEMICAL ANALYSIS OF STREAM SEDIMENTS AND ROCKS

The sampling schedule of the stream sediments in this area, which had been originally planned at the end of the first quarter investigation, had to be somewhat changed as the results of the analysis made with the stream sediment sampling in the Uno Area, since some problem arose as to the applicability of the originally scheduled sampling. For the purpose of further reviewing, three typical streams had been selected, and the sampling of sediments was performed about every 500m along a distance of several kilometers. Also an additional sampling was made in the smaller streams around the Range, and in the Burkitt granite area, totaling 69 different places.

Some portions of the sampling of the stream sediments and rock samples collected in the course of geologic mapping and radiometric surveying were put to the on-the-spot analysis. The major samples, however, analyzed by P.N.C. in Japan. Fig. 3 shows the location of sample collection and the results of the analysis.

According to the analysis from the samples of stream sediments, except those collected from the Burkitt granite area, no trace of uranium was detected, while thorium ranging from 0.004% to 0.029% ThO_2 was recognized in all the samples collected from 15 localities. As to rock samples, thorium was analyzed at the ranging from 0.013% to 0.26% ThO_2, but no anomalous value of uranium was recognized. The results of analysis of uranium and

thorium in the samples of Burkitt granite area of the lease and of porphyritic rhyolite in the Gawler Range Volcanics are as follows:

	U_3O_8 %	ThO_2 %
Burkitt Granite	0.004	0.017
Gawler Range Volcanics	0.01	0.042

Representative analysis is shown in the Table.

Table 1

Chemical assay results of rocks

Sample No.	Locality Traverse line	Rock facies	Radioactive anomalies	U_3O_8 %	ThO_2 %
6001		cgl	210 r/h	0.001	0.096
6002		granite	150	0.004	0.017
6003		"	70	0.002	
6004		pegmatite	35	0.001	
6005		quartz-ss	10	0.001	
6006		red-ss	20	0.000	
6007		cgl	350	0.001	0.260
6008		ss	9	0.000	
6009		"	15	0.000	
6010		cgl	120	0.001	0.084
6011		"	280	0.002	0.044
6012		"	600	0.004	0.170
6014		rhyolite	40	0.001	0.042
6015		cgl	75	0.002	
6016		"	290	0.000	0.096
	No.1-590m	"	190	0.001	0.052
	No.4-650m	"	100	0.001	0.023
	No.5-266m	"	115	0.001	0.058
	No.6-243m	"	190	0.001	0.013
	No.8-148m	"	110	0.001	0.067

ss : sandstone
cgl : conglomerate

MINERALOGICAL RESEARCH

The mineralogical research of the samples from the Corunna Area has also been conducted in P.N.C. laboratory as in the case of the Uno Range Area.

The results of the research so far obtained are given as follows: considering from these results, the situation in the Corunna Area both geologically and geochemically is generally identical as in the case of the Uno Range Area. Therefore, it can be considered that the results of the investigation and research in the Uno Range Area may be applicable to those of this Area.

Radioluxographic test was performed on each specimens (13 sample materials) collected from the Corunna Area. These are shown in the photographs No. 1 to No. 13 with corresponding polished specimens.

After the result of the radioluxographs it has been revealed that the radioactivity is mainly observed in the matrix of gravel and fine sand grains. Photograph 1 (6001, pebble conglomerate), Photograph 5 (6011, pebble conglomerate), Photograph 6 (6012, pebble conglomerate), Photograph 9 (C-T1-590m, pebble conglomerate), and Photograph 11 (C-T5-266m, pebble conglomerate) are representing particularly well the existence of radioactivity in the fine grained sand part filling the interstices between the coarse pebble.

As it has been determined that the higher radioactivities were enriched in the finer sand grains filling interstices between the pebbles or the coarse sand grains. Sand grains were classified by sieving, and were put to the heavy liquid separation. After study it has been clearly observed that the higher radioactivity in the heavy minerals of finer grains.

Table 2

Shieving and heavy liquid separation
of sample No. 6012

Relation of grain and radioactivity

Grain size mm		Radioactivity per 0.2 gramme cpm
1	0.5	51
0.5	0.25	97
0.25	0.125	131
0.125	0.06	175
- 0.06		206

Relation of density and radioactivity

Grain size 0.125 0.06 mm

Density of minerals		Radioactivity per 0.2 gramme cpm
over	2.89	1557
2.89	2.70	122
under	2.70	120

After the study by X-ray diffraction method and microscope on these heavy minerals, main minerals are composed of zircon, anatase, monazite, rutile, crandallite, and probably thorite.

In order to clarify the possibility of the presence of radioactive elements contained in the heavy minerals, and their genesis, microscopic study of autoradiograph has been carried out. As the results of the comparative study of these sections and the α-Ray tracks on the autoradiograph to observe the radioactive anomalies, it has been confirmed that all of the above listed heavy minerals were containing radioactive elements, particularly, crandallite, thorite, and monazite (most of the monazite in this area was assumed to have been altered, and transformed into crandallite in part or in whole. In most cases, a slight trace of its presence was observed in crandallite as indicated by Photo-17) were observed containing larger amount of radioactive elements comparing with other heavy minerals.

The heavy minerals were contained in the matrix of the pebbles or the coarse grains in either spherical or cylindrical shape wrought by weathering, and some of them altered into crandallite (Photo-17, Photo-18). These heavy minerals, however, are assumed to have been washed or transported to this area where they had been deposited or accumulated.

In summing up the results of these tests and studies, it can be assumed that the ore deposits in the Corunna Area has the same genesis as in the Uno Range Area. In other words, it is

the detrital deposits consisting of radioactive minerals such as zircon, monazite, thorite, and the like which filled the interstices between the pebbles and the coarse sand grains, and it is considered that after having settled down as deposits, a partial alteration or leach-out had taken place upon those minerals, thus producing such a radioactive mineral as crandallite.

The heavy minerals collected as samples (above 2.89 specific gravity) are shown in the following table (the listing of minerals is in the decreasing order):

Table 3

Sample No.	Heavy mineral (specific gravity above 2.89)
6001	Hematite
6002	Magnetite, Hornblende
6007	Crandallite, Anatase, Monazite, Zircon
6010	Zircon, Anatase, Crandallite, Monazite, Rutile, (Thorite)
6011	Crandallite, Rutile, Monazite
6012	Zircon, Anatase, Crandallite, Monazite, Rutile, (Thorite)
6014	Barite, Anatase, Crandallite
6016	Hematite
C-T1-590m	Hematite, Goethite
C-T4-650m	Anatase, Zircon, Crandallite, Rutile, (Monazite)
C-T5-266m	Crandallite, Anatase, Zircon, Rutile
C-T6-243m	Anatase, Zircon, Rutile, Crandallite
C-T8-148m	Crandallite

( ) : not exactly identified.

FURTHER EXPLORATION PROGRAMME

The following schedule of field works as part of the third quarter investigation in the area under the Special Mining Lease No. 498 is projected:

(1) Geologic and radiometric mapping along the prospecting lines of radioactive anomalous zone running northward in the eastern wing of the Corunna Range.

(2) Radiometric grid surveying at the representative anomalous area.

(3) Geologic survey throughout the entire lease area.

General chemical analysis will be performed in AMDEL in Australia and in P.N.C. in Japan, and the mineralogical research will be done at the laboratory of P.N.C. in Japan.

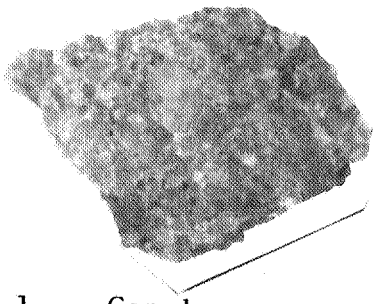
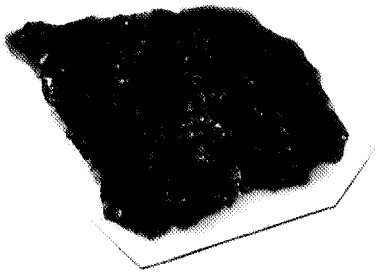


Photo. -1 Conglomerate



Sample №. 6001

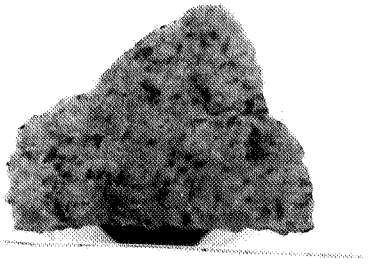
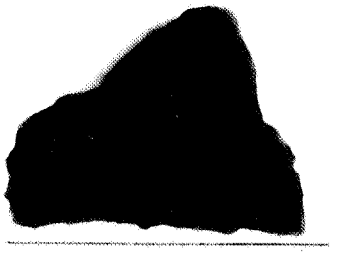


Photo.-2 Granite



Sample №. 6002

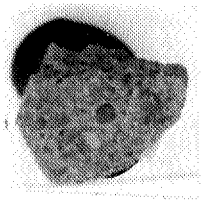


Photo.-3 Conglomerate

Sample №. 6007

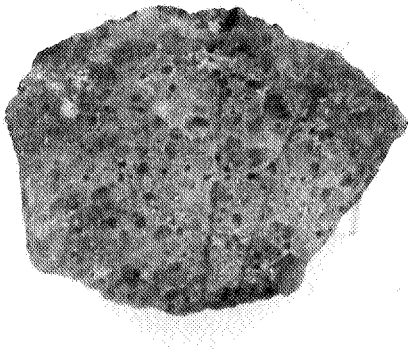
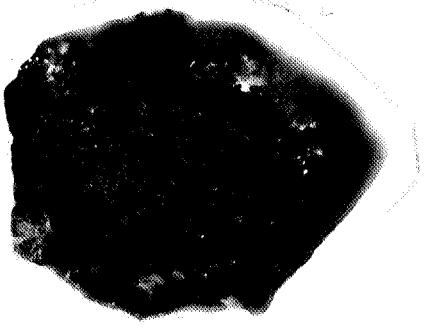


Photo.-4 Conglomerate

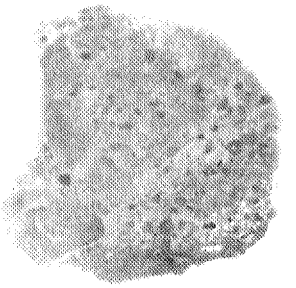


Sample №. 6010

Left: Polished chip

Right: Radioluxograph Exposed 48 hours by a film of ASA 3000

0 1 2cm



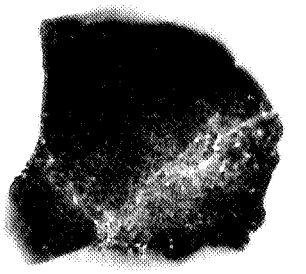


Photo.-5 Conglomerate Sample №. 6011

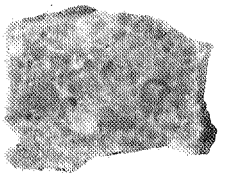
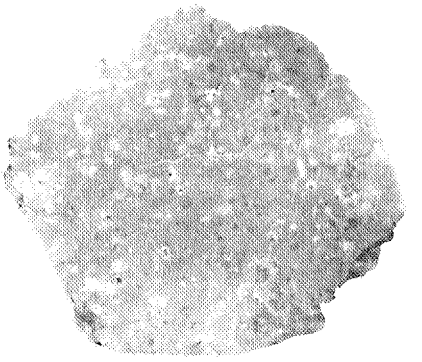


Photo.-6 Conglomerate Sample №. 6012



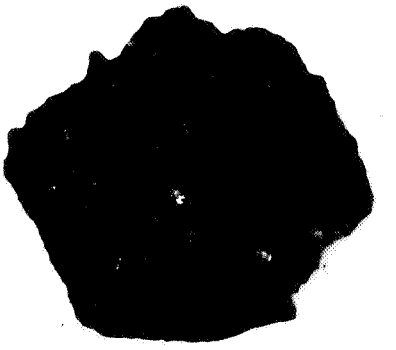


Photo.-7 Porphyritic rhyolite Sample №. 6014

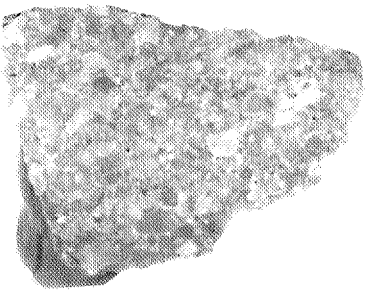


Photo.-8 Conglomerate Sample №. 6016

Left: Polished chip

Right: Radioluxograph Exposed 48 hours by a film of ASA 3000

0 1 2 cm

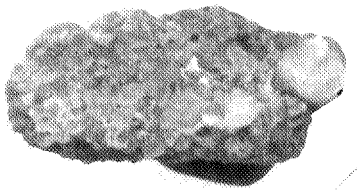
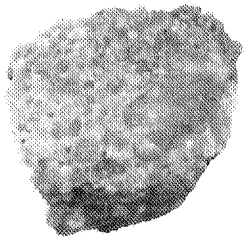


Photo.-9 Conglomerate Sample No. C-T1-590 m



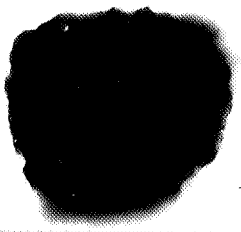
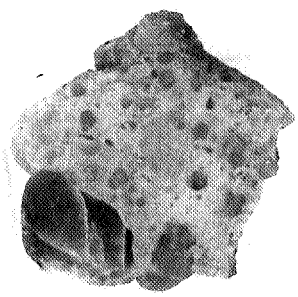


Photo.-10 Conglomerate Sample No. C-T4-650m

Photo.-11 Conglomerate Sample No. C-T5-266 m



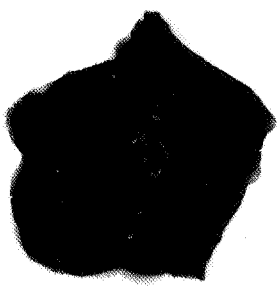


Photo.- 12 Conglomerate Sample No. C-T6-243 m

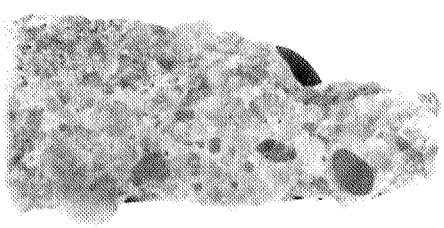


Photo.-13 Conglomerate Sample No. C-T8-148 m

Left: Polished chip
Right: Radioluxograph Exposed 48 by a film of ASA 3000

The autoradiographs from Photo. 14 to Photo. 18 exposed for a week to α-ray from thin sections

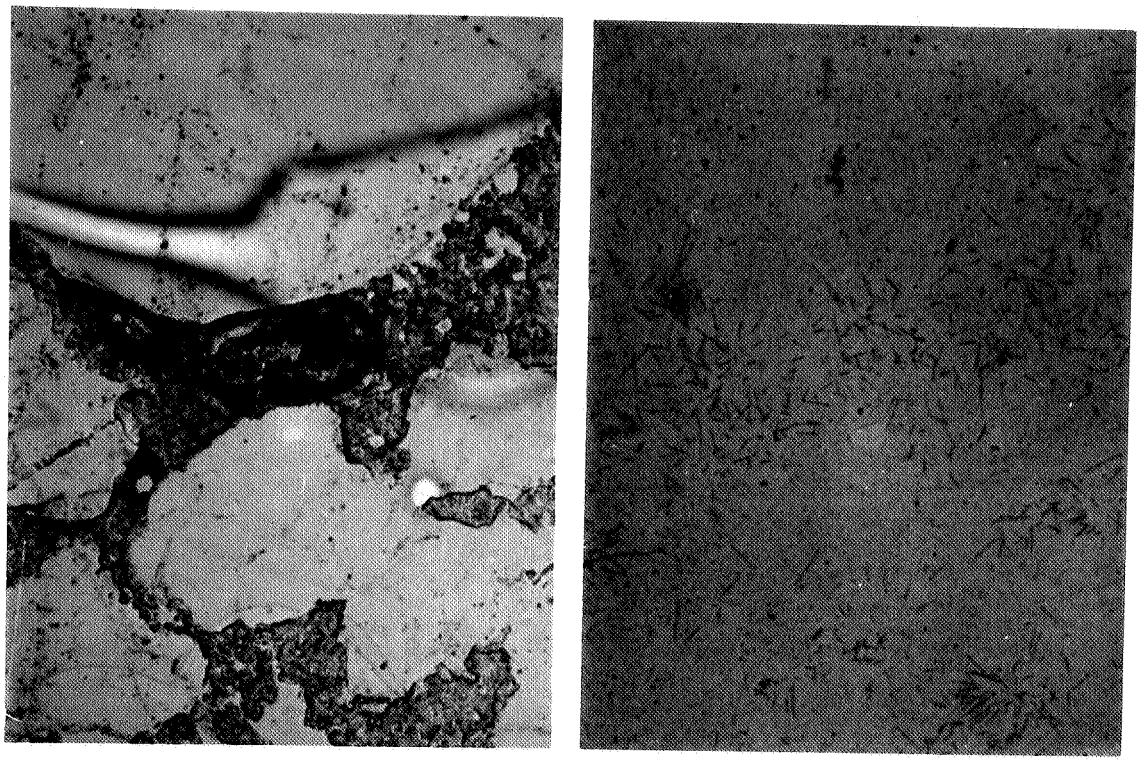


Photo-14 Zircon (Z) and Crandallite (C) between gravels or coasse sands in sample №. 6012

Left: Microphotograph of thin section
Right: Microphotograph of autoradiograph

0 200μ

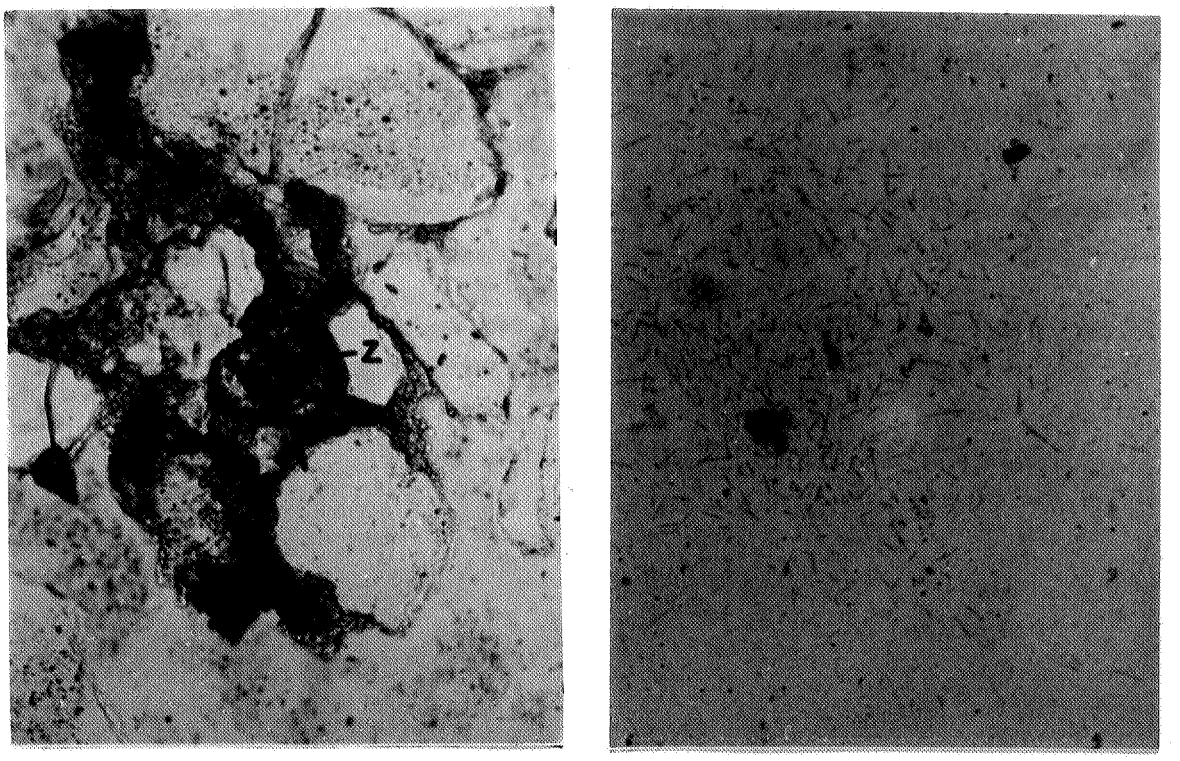


Photo.-15 Zircon (Z) and crandallite (C) between gravels or coasse sands in sample №. 6012 0 200μ

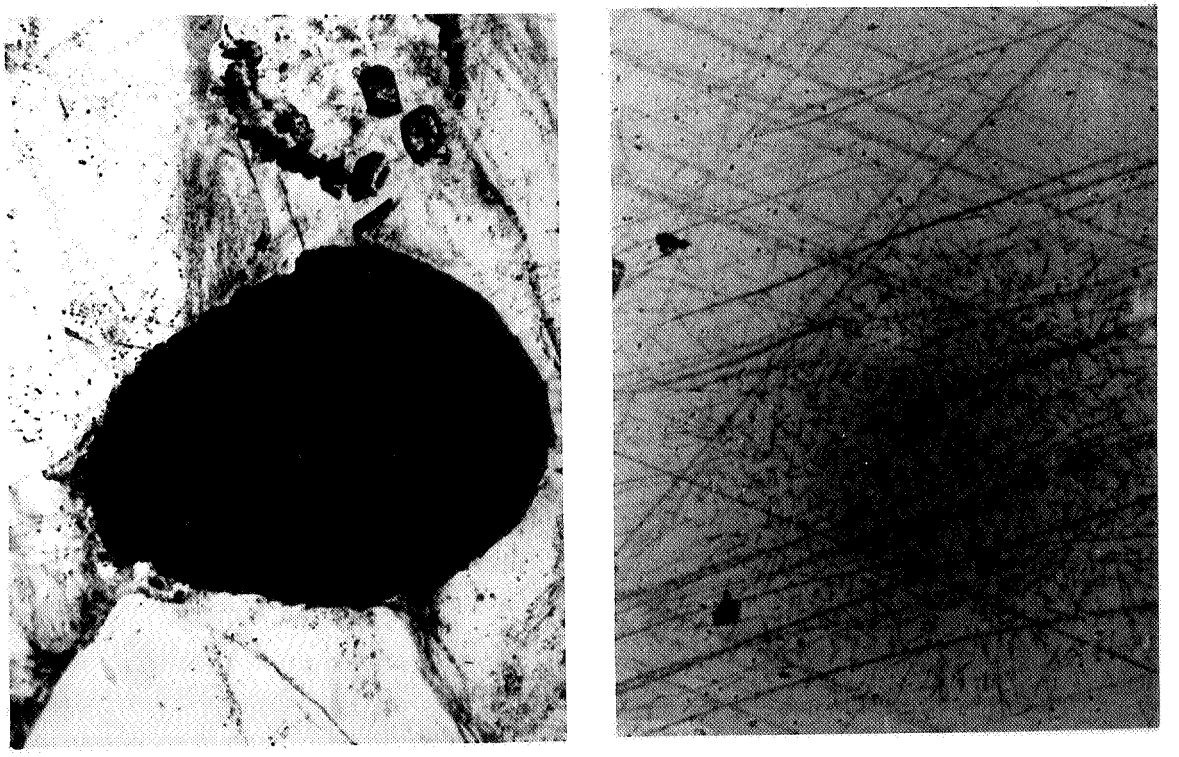


Photo.-16 Anatase (black) in sample №. 6010 0 100μ

Left: Microphotograph of thin section
Right: Microphotograph of autoradiograph

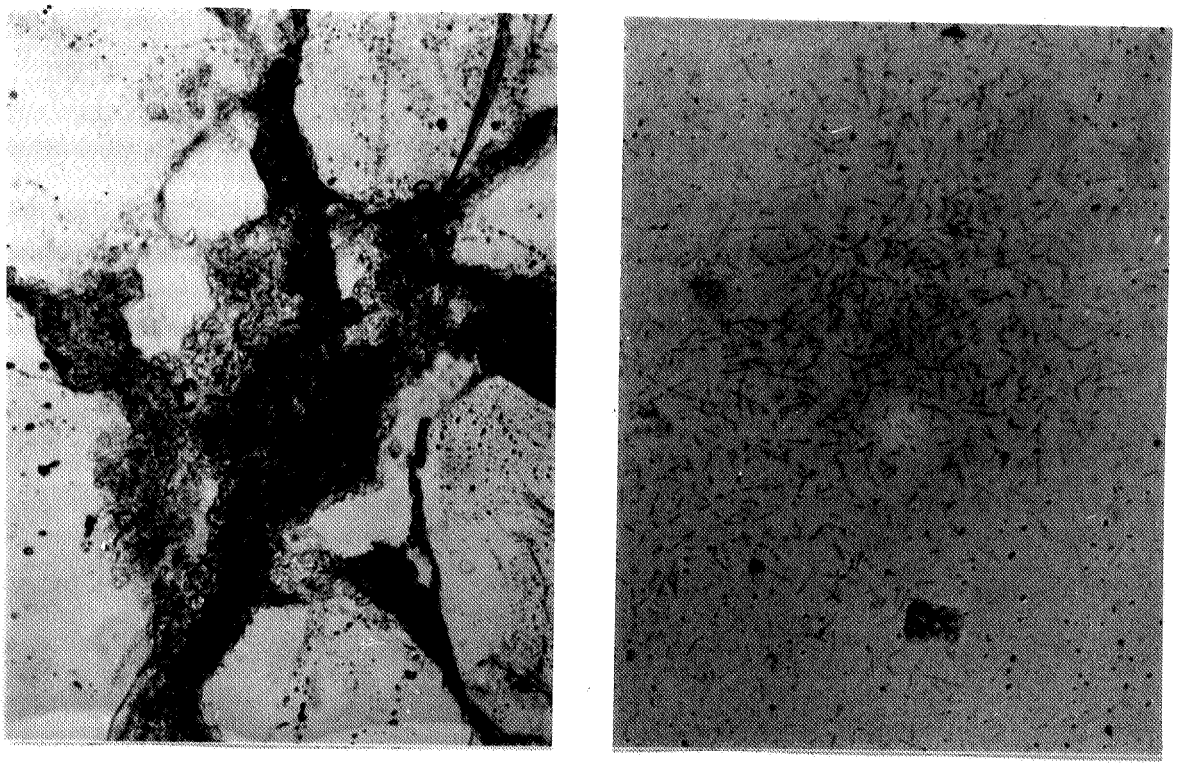


Photo.-17 Crandallite (C) which would have been altered from monazite in sample №. 6012

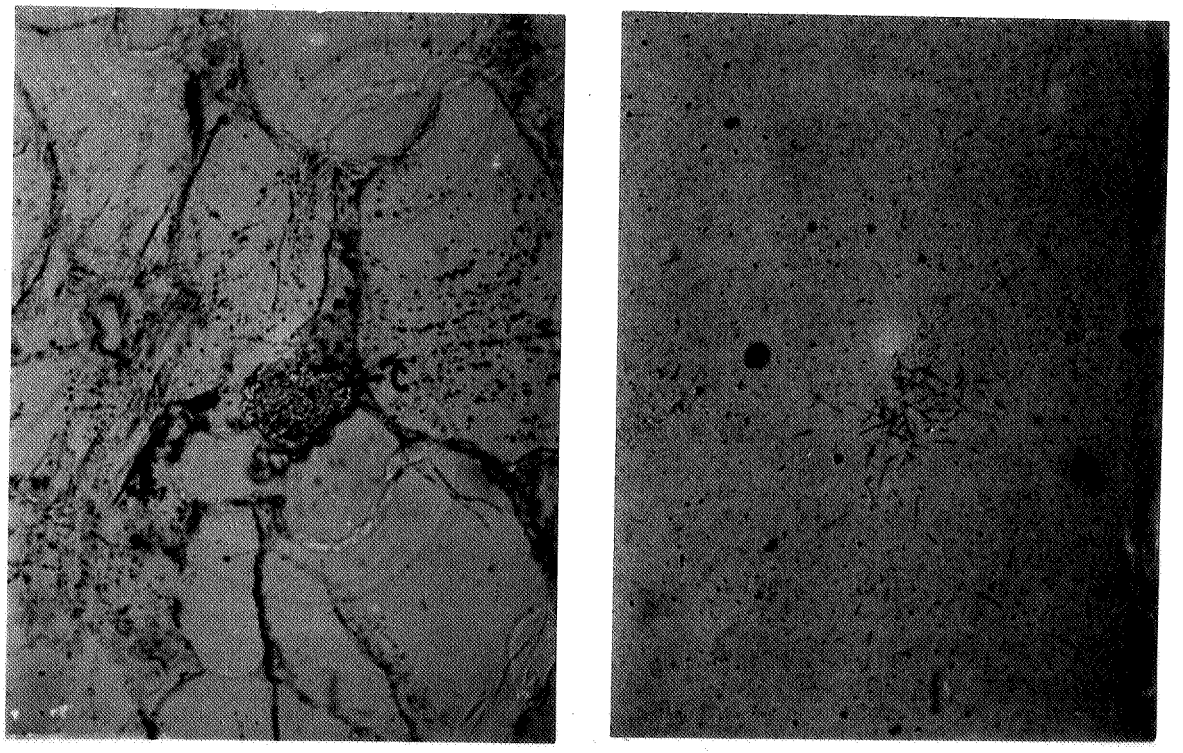
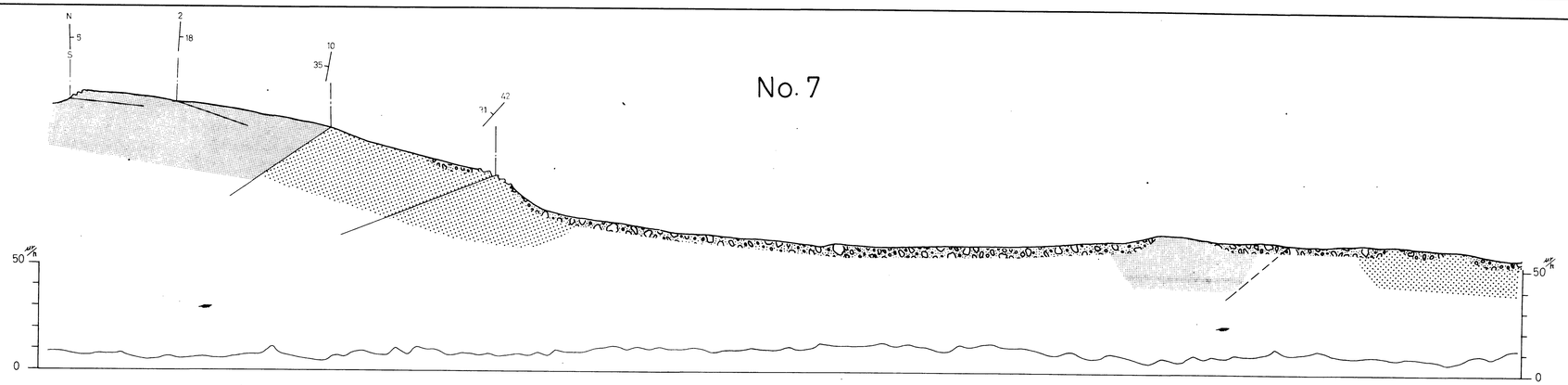


Photo.-18 Crandallite (C) in sample №. 6010

Left: Microphotograph of thin section
Right: Microphotograph of autoradiograph

0 100μ

No. 7



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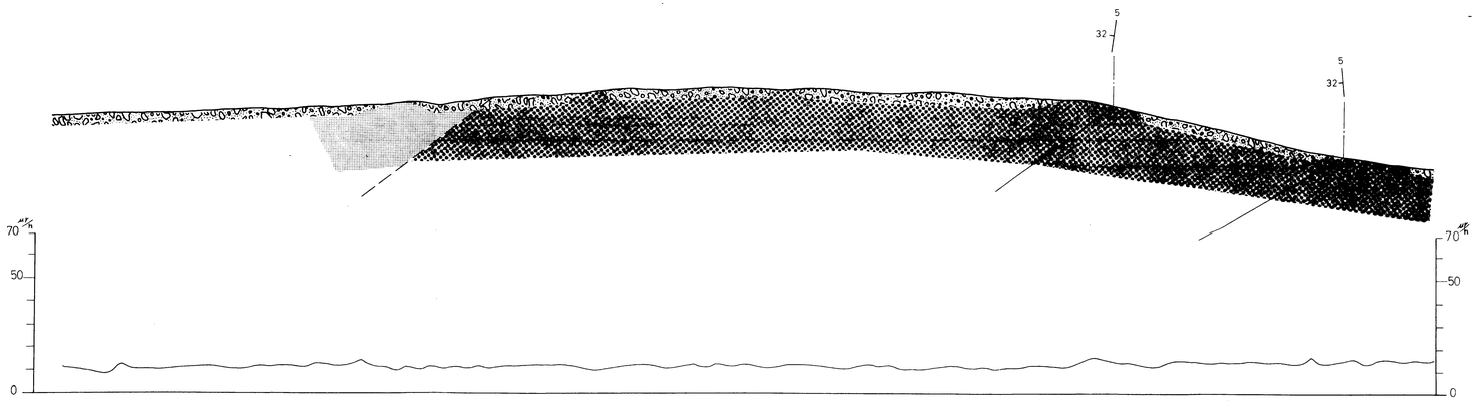
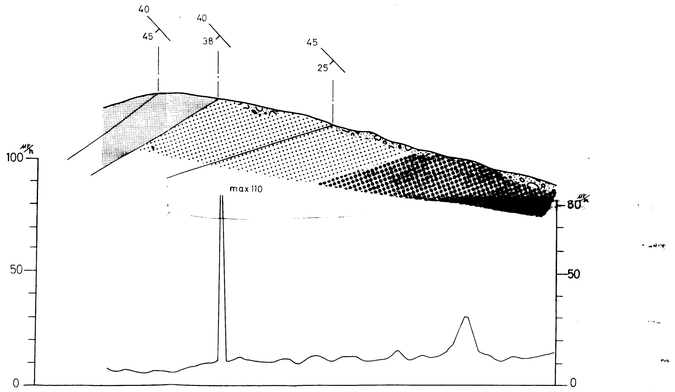
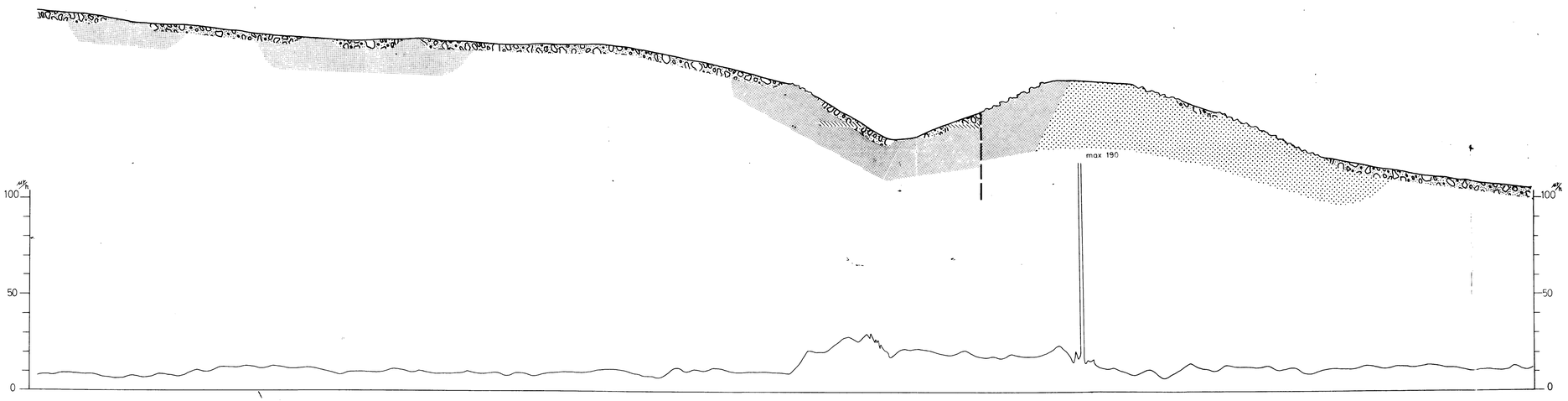


No. 8



No.10



Debris

Shale
Quartzite

Grey Sandstone

Red Sandstone

Fault

Scale in Meters

0 50 100 150

Scintillometer
JRC ALOKA
TCS 122B

NISSHO-IWAI Co.(Aust.)Pty. Ltd

SML. 498 Corunna

CROSS SECTION SHOWING
GROUND RADIOACTIVE ANOMALIES
LINE No. 7 — 10

AUTHORS / DRAFTED	GEOLOGICAL SECTION of P.N.G. for NISSHO-IWAI	CHECKED S. ARATANI	PLAN No. C 404
		DATE MAY 1971	

Fig

15.20 -1

CORUNNA
SOUTH AUSTRALIA

137°00'

32°35'

SMAN HOMESTEAD 19 MI

40'

Dry wash

Vermin proof

Tornee (Burney) Well Dam

Hill @ West end of HILL

Warwicks Well

Pipeline

Dry wash

Vermin proof

Dry wash

Vermin proof

Vermin proof

Dry wash

Tassies Creek

Tassies Creek Fault

Eastern Fault

Dry wash

Dry wash

White Dam

Corunna

Gravel pits

HIGHWAY

A — B

C — D

Gawler Range Volcanics

Quartzite

Grey Sandstone

Red Sandstone

Fault

Radioactive Anomalons Zone

Scale in Kilometers

0 1 2 3

Scale 1:20,000

1 ½ 0 1 2 3 Miles

1000 500 0 1000 2000 3000 4000 Metres

1000 500 0 1000 2000 3000 4000 Yards

NISSHO-IWAI Co(Aust)Pty. Ltd

SML. 498 Corunna

GEOLOGICAL MAP of CORUNNA RANGE

AUTHORS: GEOLOGICAL SECTION OF P.N.C. for NISSHO-IWAI	CHECKED: S. ARATANI	PLAN No. C 405
DRAFTED:	DATE: MAY 1971	

Fig 2

RECEIVED 5 MAY 1971 DEPT. OF MINES SECURITY

1520-2

CORUNNA
SOUTH AUSTRALIA

137° 00′

32° 35′

SIAM HOMESTEAD 19 MI

Dry wash
Vermin proof
Hornee (Burney) Well Dam
1085 ⊙ WEST END HILL
Warwicks Well
Pipeline
Tassies Creek
1275 △ CORUNNA NORTH
1248
CORUNNA SOUTH ⊙ 1252
832 ⊙ BARRETT HILL
White Dam
Corunna
HIGHWAY
Gravel pits

Scale 1:20,000

1 ½ 0 1 2 3 Miles
1000 500 0 1000 2000 3000 4000 Metres
1000 500 0 1000 2000 3000 4000 Yards

Stream Sediment
× SS 53 Sample No.
0.002 U_3O_8 %
0.020 ThO_2 %

Rock Sample
× 6001 Sample No.
0.000 U_3O_8 %
0.005 ThO_2 %

—— TNo.7 Traverse Line

NISSHO-IWAI Co.(Aust) Pty. Ltd

SLM. 498. Corunna

LOCALITY MAP of STREAM SEDIMENTS, ROCK SAMPLES & LOCALITY of TRAVERSE LINES at CORUNNA AREA

AUTHORS DRAFTED GEOLOGY A.L. SECTION of P.N.C. for NISSHO-IWAI	CHECKED S. ARATANI	PLAN No. C 201
	DATE MAY 1971	

RECEIVED 5 MAY 1971 DEPT. OF MINES SECURITY 1529

Fig 3

15.20-3

NISSHO-IWAI CO. (AUST.) PTY. LTD.
499 Bourke Street,
MELBOURNE. 3000.

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16th February, 1971.

REPORT ON THE DISCOVERY OF RADIOACTIVE MINERALS

(1) Location

The location of discovery of radioactive anomaly is longitude 137°07' East, latitude 32°39' South, which is nearly at the centre of the Range. It is located about 1.5km in the NW direction of Corunna North and only accessible by four (4) wheel drive vehicles.

(2) History

Corunna conglomerate of the late Proterozoic Era is distributed in this area similar to the Uno area. Expecting the sedimentary type uranium deposit to occur in this area, we submitted the application for a Special Mining Lease on this area to the Department of Mines on the date of 1st October. It was granted on 5th November, 1970: the number is 498 and the date of commencement is 5th November, 1970.

The present field work had it's start at the beginning of December, 1970. Senior geologist K. Hirakawa of the Power Reactor and Nuclear Fuel Development Corporation (PNC) conducted the work throughout the first quarter. As a first step of the work, systematic carborne radiometric survey had been conducted to cover the whole of the lease area. As a result, radioactive anomalies with a reading 2 - 3 times that of the background count was detected in pebble conglomerate of Corunna conglomerate, on 14th December, 1970.

..../2

(3) Geology and Radioactive Anomaly

Corunna conglomerate is divided from lower part red sandstone member, grey sandstone member and quartzite member. It is clear that anomalous zone is in the upper part of grey sandstone member. Anomalous count is 0.05 - 0.20 mR/H on the average. It was traced intermittently for a distance of 8km on the horizon. This anomalous layer will be correlated with that of the Uno Range. The thickness of the anomalous zone is not clear because of poor outcrops but it is estimated to be about 1.0m.

The type of minerals are not yet determined.

The chemical assay results of outcrop chip samples by AMDEL in Adelaide, South Australia are as follows:-

SAMPLE NO.	U_3O_8(%)	ThO_2(%)	RADIOACTIVITY OF OUTCROP IN mR/H
1	0.005	0.10	0.21
2	0.005	0.10	0.19

(4) Exploration

Our exploration program in the 1st year (5th November, 1970 to 4th November, 1971) is as follows:-

Geological Mapping
Radiometric Survey
Geochemical Survey
Sampling and Assaying

lines 21-27
28-33
51-52

64

THIRD QUARTERLY REPORT

O N

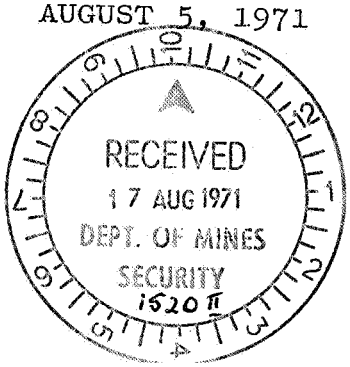
SPECIAL MINING LEASE NO. 498

IN THE CORUNNA AREA

SOUTH AUSTRALIA

Nissho-Iwai Co. (Australia) Pty. Ltd.,
499 Bourke Street,
MELBOURNE. 3000.

AUGUST 5, 1971



C O N T E N T

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ILLUSTRATIONS

SUMMARY

The prospecting of the S.M.L. 498 Corunna area was carried out in the third quarter of this year in succession to the preceding quarter. Mr. Minoru KOINUMA, geologist with the P.N.C. of Japan, took charge of the exploration on the instructions of Mr. ARATANI, exploration manager.

In this quarter, emphasis was put on the following works:

(1) Grid survey and detailed radiometric traverse line survey in the places where high radioactive anomaly was detected in the area of Corunna hill.

(2) Pursuing of the grey sandstone member showing radioactive anomaly and geologic investigations of its overlying and underlying members in the eastern wing of Corunna syncline.

(3) Geologic and radiometric surveys in the area on the north of west end hill in the western wing of Corunna syncline.

The results obtained are summarized as follows:

(a) The detailed radiometric traverse line survey was carried out around the two radioactive outcrops, which were found at the point of map grid 154634* in the topographical map of "CORUNNA" (1 : 50,000) and showing activity levels of 0.6 mr/hr and 0.28 mr/hr respectively, but radioactivity higher than hitherto reported has not been detected.

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* The first three figures of the number represent a distance (15.4 yards) from the west end of the topographical map, and the last three figures indicate a distance, 63400 (1000 yards), from the south end.

(b) The geologic features of the eastern wing of Corunna hill running from NNE to SSW are divided into two parts, eastern and western, at the central part by Ash Reef Fault which was referred as an east side fault in the report of the second quarter but is written as Ash Reef Fault in Port Augusta folio (1 : 250,000) running through the central part of the eastern wing from south to north. In the western half, the eastern wing of Corunna syncline is distributed in a strike of NW-SE almost in parallel with Ash Reef Fault, showing a vertical or overturned.

In the eastern half, geologic features have a general tendency of monocline structure to the north though only the red sandstone member which comprises a lower part of Corunna conglomerate shows a strike of NW to SE, being accompanied by anticline and syncline structures in some parts. The eastern half is entirely different in geological structure from the western half.

(c) Sufficient geological investigations have not being carried out in the western wing of Corunna hill, because much time were spent to the analysis of geological structure in the eastern wing. Therefore the results of investigations in this area will be dealt with in the next report though it has been made clear that the western wing is complex in geological structure, showing anticline and others as well as a fault crossing West End Fault.

DETAILED RADIOMETRIC TRAVERSE LINE SURVEY

A detailed radiometric traverse line survey was carried out centering around the anomaly points, which were found at the point of map grid 154634 in the topographical map of Corunna (1 : 50,000) showed radioactivity of some 0.6 mr/hr and 0.28 mr/hr respectively. The point of 154634 is located approximately 800 feet above the sea level near the uppermost stream of a large creek which comes from the triangulation station of Corunna north to the north and then crosses the eastern wing of Corunna hill to flow eastward. The area around the outcrops has comparatively steep topographical features in the area of Corunna hill. Though the area was comparatively steep, the greater part of the radioactive member (grey sandstone member) was covered with debris of the overlying quartzite (in general featuring a cliff and is well exposed) and grey sandstone members. Accordingly, exposure of the radioactive anomalous zone itself was bad, and the survey could not help replying on boulder. The radioactive anomaly, however, has been found to be continuously distributed throughout the surveyed area. We provided a line in an area through the line extending 300 m to the upper stream and 200 m to the downstream from the outcrop. Then we drew traverse lines perpendicular to the slopes on both sides of valley at intervals of 30 to 90 m. 13 traverse lines are totalling 2,200 m and supplemental lines totalling in 1,000 m length.

Radioactivity was measured at intervals of 2.5 m except the place around the horizon of radioactive members where the measurement was made at intervals of 1 m.

It has been previously known that the rock showing radioactive anomaly is conglomerate. The gravel of conglomerate in the area of the present survey has a diameter of 2 cm in average and 6 cm at the maximum and content rate of gravels as compared with the cases hitherto reported. But the conglomerate is considered to be substantially the same as reported cases. It is a thin interformational conglomerate 20 - 30 cm in thickness and its constituent gravels are all composed of white quartzite.

This pebble conglomerate is located in the uppermost part of the grey sandstone member and is a layer of the cycles of sedimentation beginning from granule-pebble conglomerate and ending in coarse sandstone or quartzite with a distinct cross-bedding. At present this is the only layer which is known to show radioactive anomaly among the many cycles mentioned above.

The formation of pebble conglomerate showing radioactivity has gentle dip as a whole, gently undulating, at an angle of 8 - 15° to the northeast in a strike of N70 - 50W. In the present survey, no radioactive anomaly showing a higher intensity than hitherto reported has been detected, but it should be noted that some boulder rocks in the area show as high as 0.3 mr/hr in radioactivity.

In conclusion it can be said that a weak radioactivity at the point of map grid 154634 has been detected continuously but thin in thickness. Therefore, any more exploration seems to be unnecessary in an area around the point of 154634 considering these facts.

0071

GEOLOGICAL SURVEY IN THE EASTERN PART OF CORUNNA HILL

The geological structure of the eastern wing of Corunna hill is more complex than expected. The kinds of rocks distributed in the area are shown in the following table.

Table 1

A g e	Rock Unit	Thickness	Lithology
Tertiary	Gawler range volcanics		Silicified rocks, Quartz porphyry
Late Capentarian (Proterozoic)	Upper most member	50 m or more	Coarse ss., siltstone, shale and quartzite
	Quartzite member	30 m.	Cross-bedded quartzite, massive quartzite
	Grey ss. member	120 m.	Boulder conglomerate, coarse ss., granule-pebble conglomerate and granule bg. ss.
	Red ss. member	4200 m.	Boulder conglomerate, Pebble-granule bg. ss., fine ss.

ss. : sandstone

bg. : bearing

(1) Red sandstone member:

In the present survey, it was found that the red sandstone member is distributed in three main areas. The first is an area extending from Corunna Homestead to the triangulation station of Corunna north. The red sandstone member in this area is mainly consists of conglomerate, occasionally including sandstone. The conglomerate consists of such gravels as quartzite, red chert, hematite quartzite, gneiss, schist, fine sandstone with cross bedding, red sandstone and rarely iron ore. Gravels are rounded ones 2 - 20 cm in diameter. The content rate of gravels is medium and the sorting of gravels is good. In the east of Corunna hill, the rocks which are seen in the upper part of the conglomerate are only fine to medium sandstone, and purplish shales observed in Tassie creek are never found among them.

In a few places on the east side of the triangulation station of Corunna north, the red sandstone member and the overlying grey sandstone and quartzite members are observed to have unconformable relation with each other, but the details will be described in the next report, because investigations are continuing at present. The extension of this red sandstone member to the north is cut off by Ash Reef Fault near the point of 168618 and disappearing from the surface of the earth.

The second area in which the red sandstone member is distributed is the area between the eastern wing of Corunna syncline and Ash Reef Fault. In this area, the red sandstone member consists of fine and coarse sandstones and sandstone of a brecciated zone of sandstone produced by Ash Reef Fault, and is located almost in parallel with the axis of Corunna syncline in

a strike of N-S (N20W to N20E), showing a vertical or overturned. It gradually decreases its thickness under the influence of Ash Reef Fault, which runs slightly diagonal to the eastern wing of Corunna syncline, and finally disappearing to the depth of the central flat area.

The third area where the red sandstone member is distributed is the east side of Ash Reef Fault. In the northern half of the eastern arm of Corunna hill, the red sandstone, which consists of pebble bearing sandstone, pebble conglomerate and coarse sandstone, is observed. While the red sandstone member shows a vertical dip in a strike of N-S on the western side of Ash Reef Fault, on the eastern side it shows a strike of NE-SW and forms small anticline and syncline at its south and north ends but generally dips monoclinally to the northeast. Its thickness is so large as to be more than 4,000 m, reaching more than 10 times the thickness hitherto reported.

In addition, in the northernmost part of Corunna hill a similar boulder conglomerate as seen around Corunna hill is observed to form a syncline which plunges to SE, accompanied with the grey sandstone and quartzite members.

(2) Grey sandstone member:

This member is clearly separated from the underlying red sandstone member by a cobble-boulder conglomerate which mainly consists of quartzite gravels and shows a clear difference in the source of supply from the red sandstone which contains diversified gravels. The thickness (20 m or more) of this conglomerate suggests that there must have been some kind of gap

between the sedimentation of the underlying red sandstone member and that of the grey sandstone member. Gravels composing this conglomerate become smaller in diameter toward the upper part and makes the conglomerate more sandy, and finally grading into coarse sandstone. In the uppermost part of the conglomerate, a thin granule conglomerate or occasionally pebble conglomerate of 10 - 50 cm in thickness are intercalating, and, furthermore, an alternation of quartzite with remarkable cross bedding, granule conglomerate and coarse sandstone is observed.

In the western wing of Corunna syncline, the grey sandstone member is distributed in the area which extends from the vicinity of Corunna north to the north in a strike of NW-SE, while in the eastern wing it can not stand against the drag by overturned-asymmetric folding and Ash Reef Fault which acts to reduce its thickness, and finally cut by Ash Reef Fault to disappear from the surface.

In the north end of Corunna hill, as mentioned above, a series of rocks are distributed covering the red sandstone in alternation, that is, from the bottom, boulder conglomerate, an alternation of granule conglomerate, coarse sandstone and quartzite with cross bedding.

(3) Quartzite member:

This member is transitional in constitution from the underlying grey sandstone, that is, from quartzite with distinct cross bedding to massive quartzite. The thickness is of some 30 m.

(4) Uppermost member:

This member was not distributed in the geological map in the present survey.

(Any relation has not yet been confirmed between this and the underlying quartzite member, but it is possible that this member has serial relation to the grey sandstone and quartzite members.)

In this member, coarse sandstone, siltsone, shale and fine sandstone are distributed in this order from the bottom, and quartzite is also included in some part. Excepting quartzite, a comparatively large part of this member is soft rock. Therefore, such members have been already eroded out in most areas, leaving only a part of shale in an area encircled with a line which unites map grid 163634 with 155642 (the western border line) and Corunna syncline (the eastern border line) and an inside area of the cyncline formed at the north end of Corunna hill. This member seems to be correlated to the black shale and the overlying fine sandstone in the Uno Area.

(5) Gawlar range volcanics:

In the eastern wing of Corunna hill, the red sandstone member of Corunna conglomerate is intruded by Gawlar range volcanics in various places. The largest body of volcanics are found in an area ranging from map grid 188745 to 188753. The nature of these rocks are supposed to be quartz porphyry, but have not yet been examined under a microscope. In the above-mentioned place of map grid, doleritic rock is observed intruded Gawlar range volcanics.

RADIOMETRIC SURVEY IN THE EASTERN WING OF CORUNNA HILL

The result of surveys hitherto carried out and the data obtained in the present survey revealed that radiometric anomaly have been recognized in only pebble conglomerate which is underlying the quartzite member. Therefore, the directly underlying beneath the quartzite zone was entirely examined at the time of geological surveys and, as a result, radioactive anomaly could be pursued pretty well. But the anomaly thus measured was not so remarkable and the radioactive anomalous zone was very thin. Since it is possible that the zone was made thin by the influence of fault and folding radioactive surveying in an area where tectonic movement had no effect seems to be necessary.

1) Corunna syncline

Corunna syncline is a folding, the axis of which extends at first to the north passing through a very near place to the east of Corunna Homestead, turns to the east under the influence of Tassie Creek Fault, goes to NNE, and runs through an eastern part of Corunna hill, then turns to the west at the point of map grid 158648 to enter the central flat area and extends to the north along the eastern wing of Corunna hill. The plunge of the folding goes northward.

The syncline, which was described as an asymmetrical syncline in the report of the second quarter, was confirmed by the survey carried out in the northern part to be an asymmetrical and/or overturned syncline showing overturn in some part. The western wing of Corunna syncline dips to

the northeast at an angle of 10 - 40° in a strike of NW-SE in the area extending from the west of Corunna hill to the triangulation station of Corunna north, while in the eastern wing of the syncline the strike is found to be south to north, becoming almost parallel to the folding axis, and the dip occasionally overturns from vertical at an angle of 90 - 65°, inclining to the west.

The members change the thickness beyond the folding axis, and in the eastern wing the grey sandstone and quartzite have a thickness more than 200 m in total.

2) Ash Reef Fault

Ash Reef Fault runs northward on the west side of Corunna hill almost in parallel with the axis of Corunna syncline, and in the north of Corunna syncline cut the eastern wing diagonally.

The location of this fault has not yet been confirmed, and its existence could be questionable according to the interpretation of the relation between the red sandstone and the overlying grey sandstone member, which will be stated in Paragraph (3).

3) Relation of the red sandstone member to the overlying grey sandstone and quartzite members

It has been believed that Corunna hill consists of Corunna conglomerate as a whole, and considered that the interelation between them is wholly conformable. We have divided it, on the basis of the classification of Corunna conglomerate in Uno range, into four members, that is red sandstone, grey sandstone, quartzite and uppermost. But

as a result of the survey in the eastern flank of Corunna hill, it came into question whether or not there had been any kind of gap between the boulder conglomerate located in the basal part of the grey sandstone member and the underlying red sandstone member as to the sedimentation. The difference observed in the kind of constituent gravels suggests that there must have been some movement between them. And unconformable features were actually found in some outcrops in the eastern wing of Corunna hill so as to prove that such a movement had occurred in the sedimentation of the members. In addition, in the eastern wing, the quartzite and grey sandstone members of Corunna syncline show a strike of almost south-north and a vertical dip, while most of the red sandstone is NE-SE in strike and generally dips to NE, though it shows some anticline and syncline, being more than 4,000 m in thickness. Therefore, if the relation between the two members is supposed to be conformable, what is the explanation of such differences in geological features will come into question.

We have no sufficient data to answer this problem at present. But a conclusion will be drawn by further investigations from the following three explanations.

(1) The member showing a strike of NW-SE and dips to NE is considered older than the Corunna conglomerate and has unconformable relation to it. But the red sandstone, grey sandstone and quartzite members have conformable relation in it.

(2) The two members (red sandstone and grey sandstone or the upper) which have been considered to belong to the Corunna conglomerate are unconformable with each other.

(3) The red sandstone member has conformable relation to the grey sandstone member and the upper. An anticlinal part (overturning), which was happened between Corunna syncline and the red sandstone member showing a strike of NW-SE was eroded probably in addition to Ash Reef Fault.

FURTHER EXPLORATION PROGRAM

1) Pursuing of radioactive anomalous zones in the directions of their strikes to confirm the structure of them by costeaning and drilling at the most favorable points.

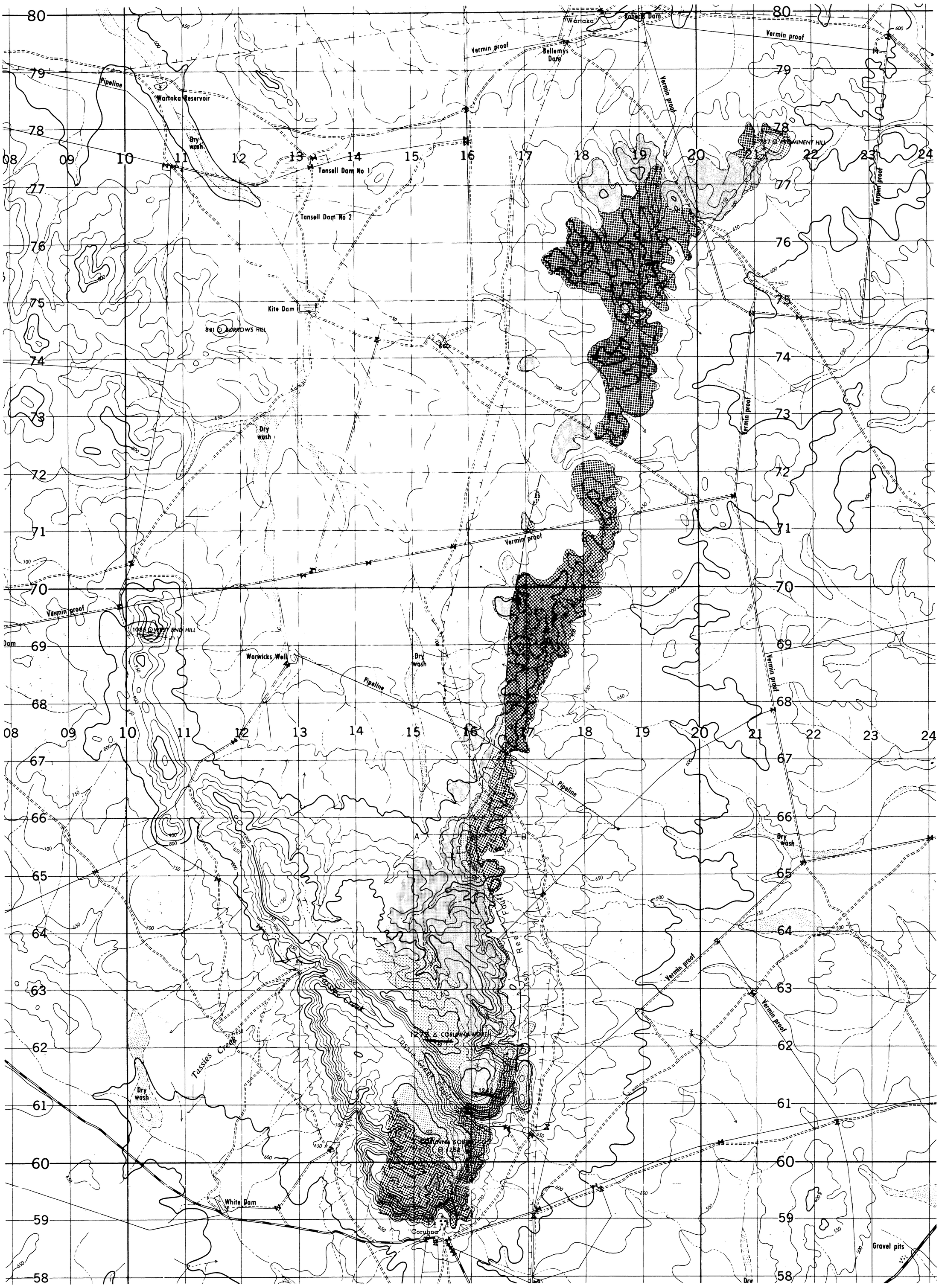
2) Investigations of radioactive anomalous zones to confirm whether or not they are located only beneath the quartzite zone and whether or not they are located also in the underlying red sandstone.

3) Investigations of the geologic relation between the red sandstone member and the overlying grey sandstone member.

4) Geological and radiometric surveys of the area around the crossing of West end fault and another fault, and of the area on the north of it.

5) Radiometric survey of a bore hole by the B.H.P. in the central part of Corunna hill.

CORUNNA
SOUTH AUSTRALIA



Scale 1: 0,000

1 ½ 0 1 2 3 Miles

1000 500 0 1000 2000 3000 4000 Metres

1000 500 0 1000 2000 3000 4000 Yards

- Tertiary
- Dolerite dyke
- Gawler Range Volcanics
- Corunna cgl.
  - Quartzite Member
  - Grey Sandstone
  - Red Sandstone
- Dip, Strike (Vertical, normal, overturned)
- Horizontal
- Syncline
- Anticline

NISSHO-IWAI Co. (Aust.) Pty Ltd.

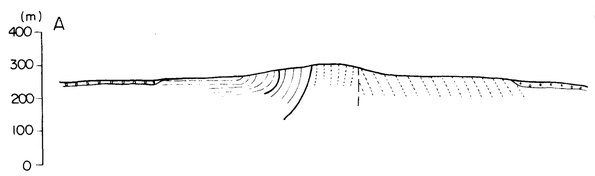
SML. 498 Corunna

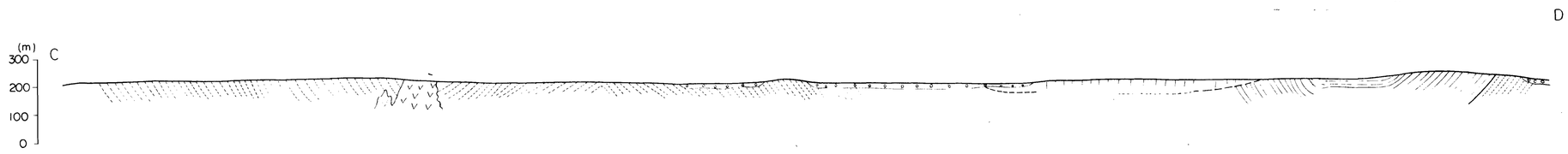
GEOLOGICAL MAP OF EASTERN PART OF CORUNNA HILL

AUTHORS	GEOLOGICAL SECTION of PNC for NISSHO-IWAI	CHECKED S. ARATANI	PLAN No.
DRAFTED		DATE AUGUST 1971	C 406

Fig. 1

1520 -10





Debris

Tertiary

Gawler Range Volcanics

Quartzite

Grey Sandstone

Red Sandstone

Scale in Meters

0 200 400 600 800 1000

NISSHO-IWAI Co.(Aust.)Pty. Ltd

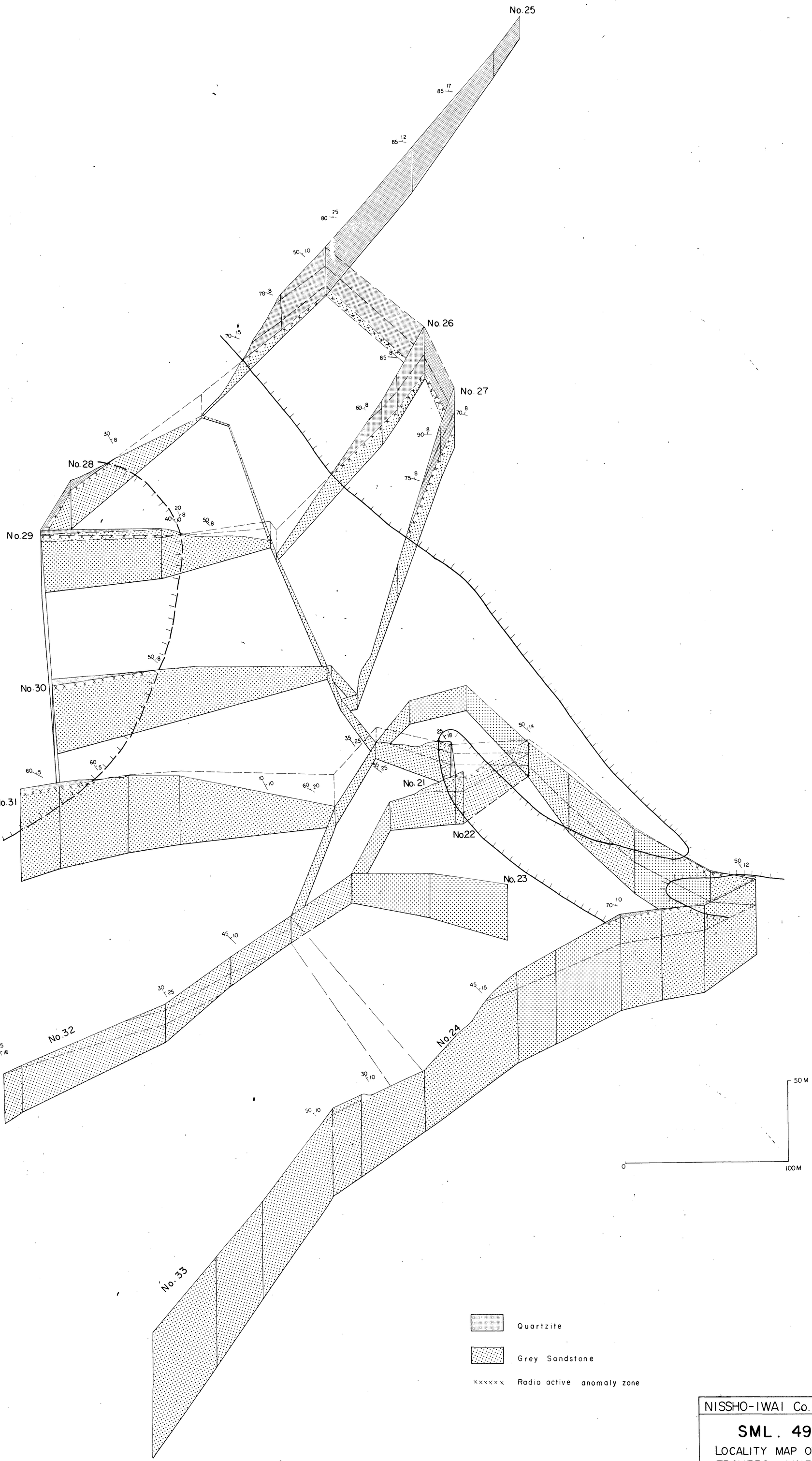
SML. 498 Corunna

GEOLOGIC PROFILE OF EASTERN PART OF CORUNNA HILL

AUTHORS GEOLOGICAL SECTION of DRAFTED PNC for NISSHO-IWAI		CHECKED S.ARATANI	PLAN No.
		DATE AUGUST 1971	C 407

Fig. 2

1520-11



NISSHO-IWAI Co.(Aust.)Pty. Ltd

SML. 498 Corunna

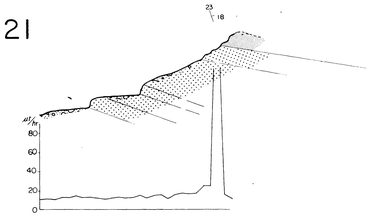
LOCALITY MAP OF DETAILED TRAVERS LINE
(SHOWING BY PANEL DIAGRAM)

AUTHORS DRAFTED	GEOLOGICAL SECTION of PNC for NISSHO-IWAI	CHECKED S ARATAN	PLAN No.
		DATE AUGUST 1971	C 408

Fig. 3

1520-12

No. 21



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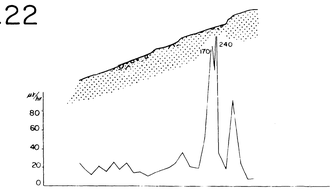

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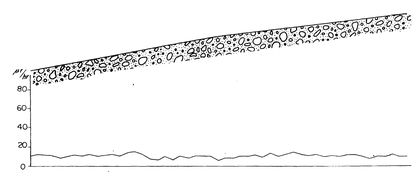

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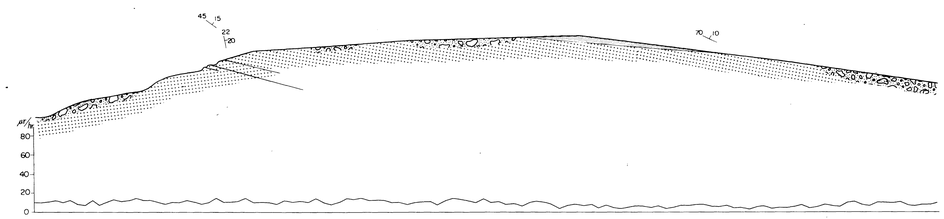

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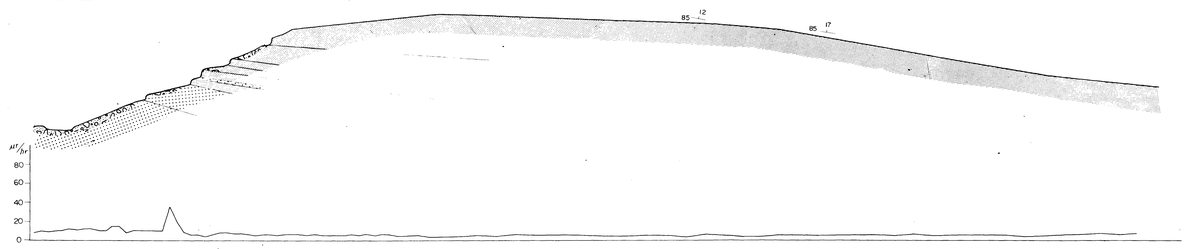
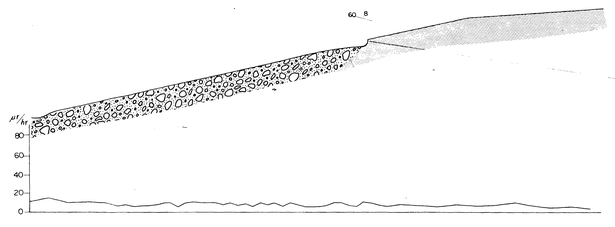


No. 26



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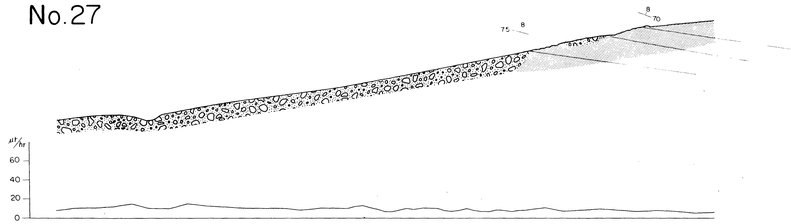


Debris

Quartzite

Grey Sandstone

Red Sandstone

Scale in Meters

0 10 20 30 40 50

Scintillometer

JRC ALOKA
TCS 122B

NISSHO-IWAI Co.(Aust.)Pty. Ltd

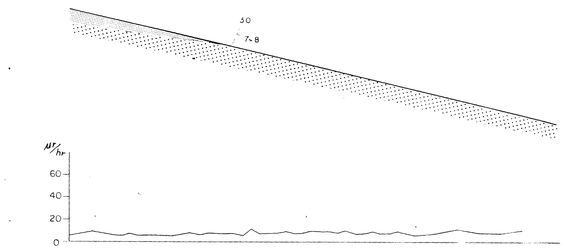
SML. 498 Corunna

CROSS SECTION SHOWING
GROUND RADIOMETRIC ANOMALIES
LINE 21 – 27

AUTHORS	GEOLOGICAL SECTION of	CHECKED S ARATANI	PLAN No
DRAFTED	P.N.G. for NISSHO-IWAI	DATE AUGUST 1971	C 409

Fig. 4

No. 28



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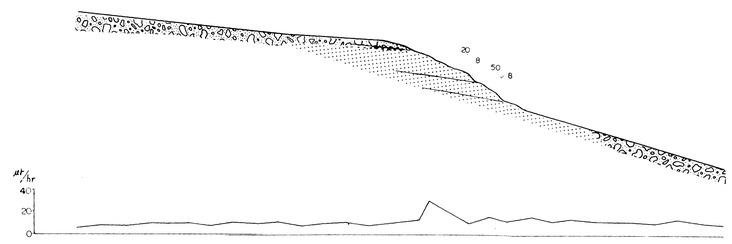

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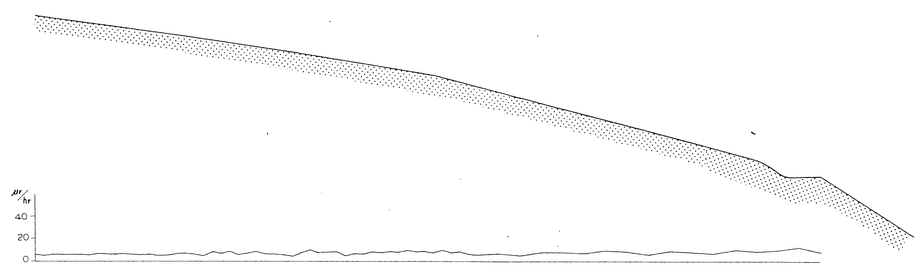

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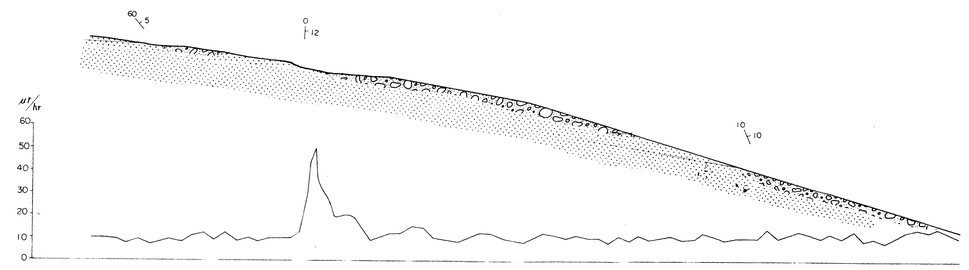

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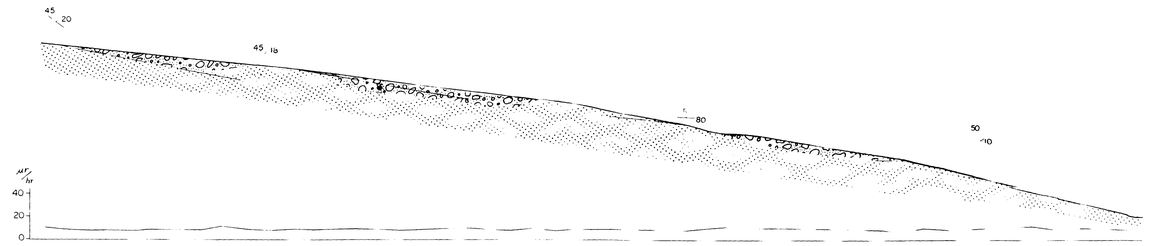

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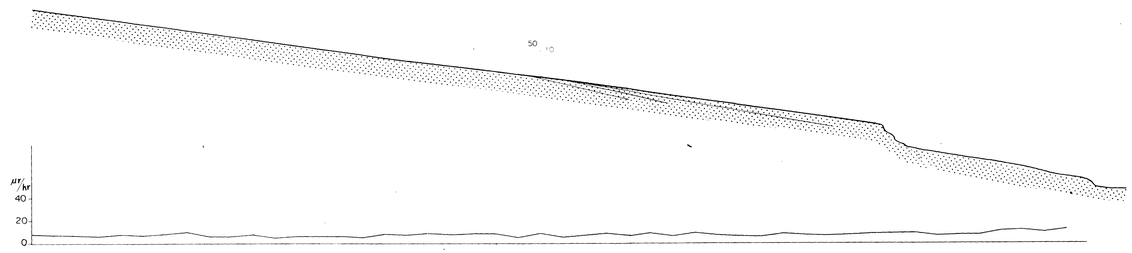


Debris

Quartzite

Grey Sandstone

Red Sandstone

Scintillometer
JRC ALOKA
TCS 122B

Scale in Meters
0 10 20 30 40 50

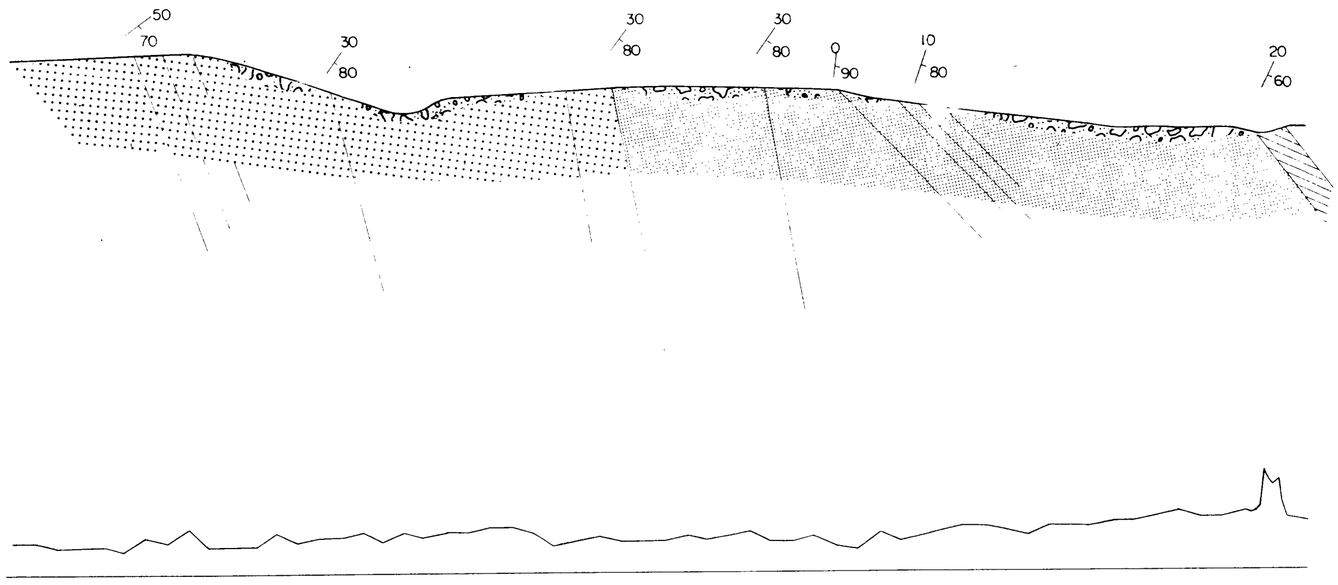
NISSHO-IWAI Co.(Aust.) Pty. Ltd

SML. 498 Corunna

CROSS SECTION SHOWING
GROUND RADIOMETRIC ANOMALIES
LINE 28-33

AUTHORS DRAFTED	GEOLOGICAL SECTION of PNC for NISSHO-IWAI	CHECKED S. ARATANI DATE AUGUST 1971	PLAN No. C 410

No. 51



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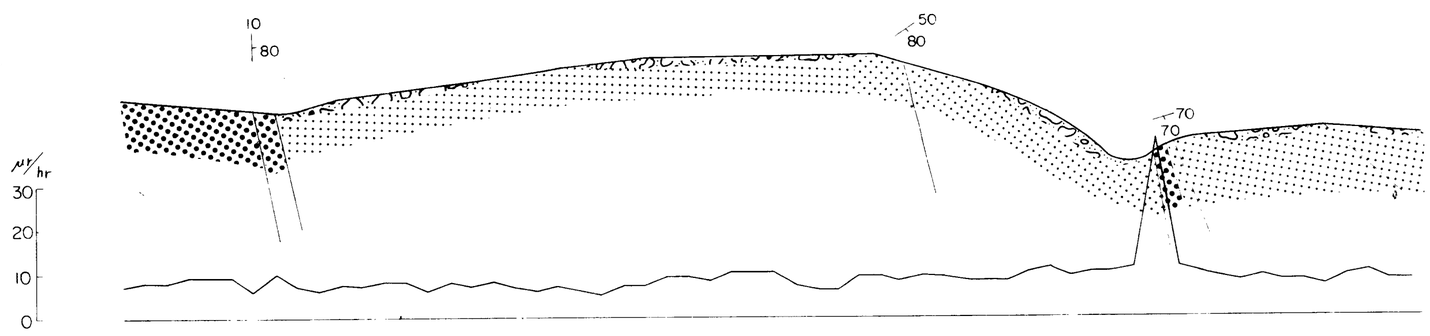


Debris

Shale

Quartzite

Grey Sandstone

Red Sandstone

Scintillometer

JRC ALOKA
TCS 122B

Scale in Meters

0 10 20 30 40 50

NISSHO-IWAI Co.(Aust.)Pty. Ltd

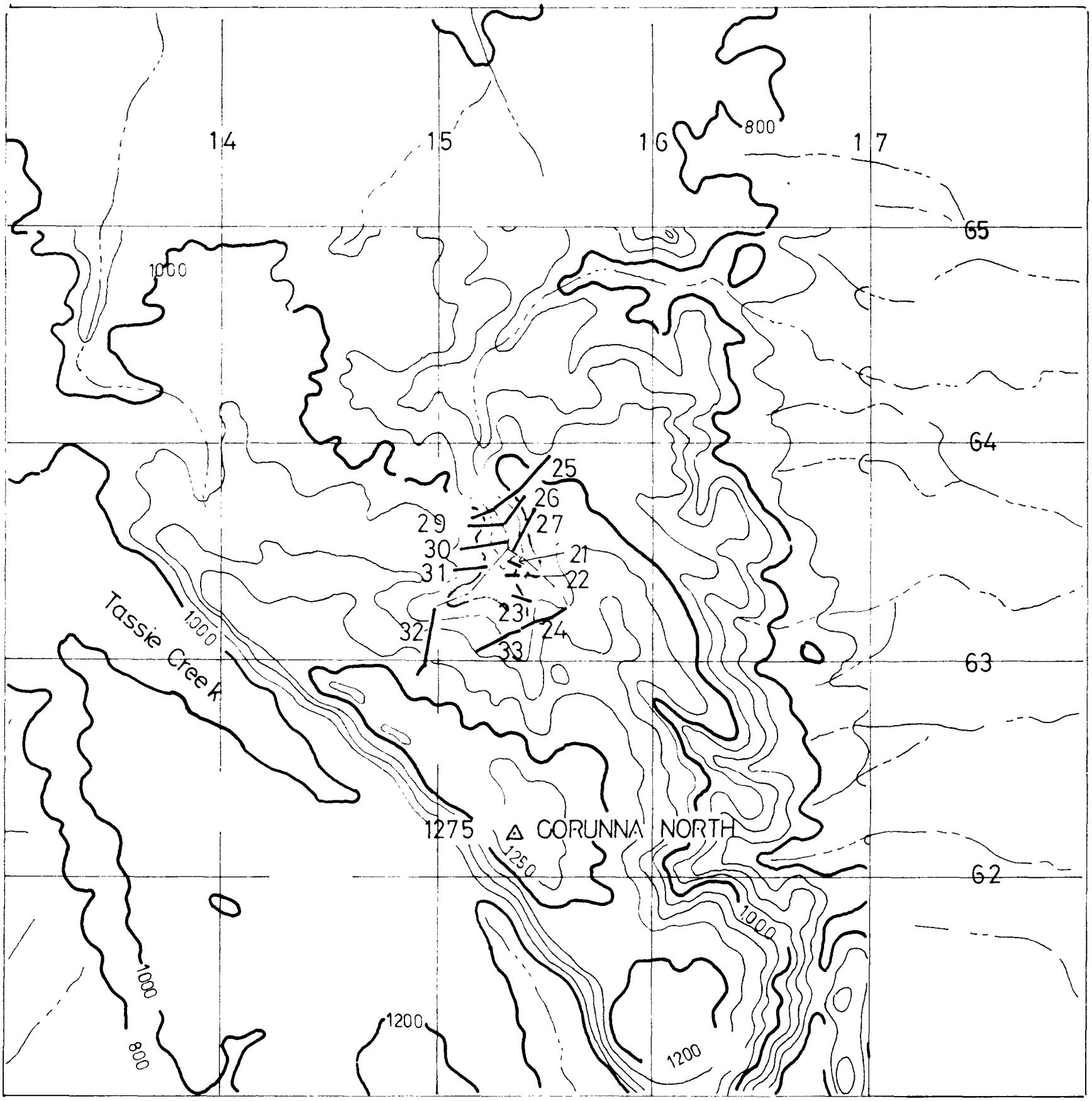
SML. 498 Corunna

CROSS SECTION SHOWING
GROUND RADIOMETRIC ANOMALIES
LINE 51 - 52

AUTHORS	GEOLOGICAL SECTION of	CHECKED S. ARATANI	PLAN No
DRAFTED	PNC for NISSHO-IWAI	DATE AUGUST 1971	C 411

Fig. 6

1520-15 ~~1520-15~~



0 500 1,000 2,000 M.

CONTOUR INTERVAL 50 FEET.

—— 23 TRAVERSE& SECTION No.

—— 62 MAP GRID

TOPOGRAPHY TAKEN FROM CORUNNA 1: 50,000

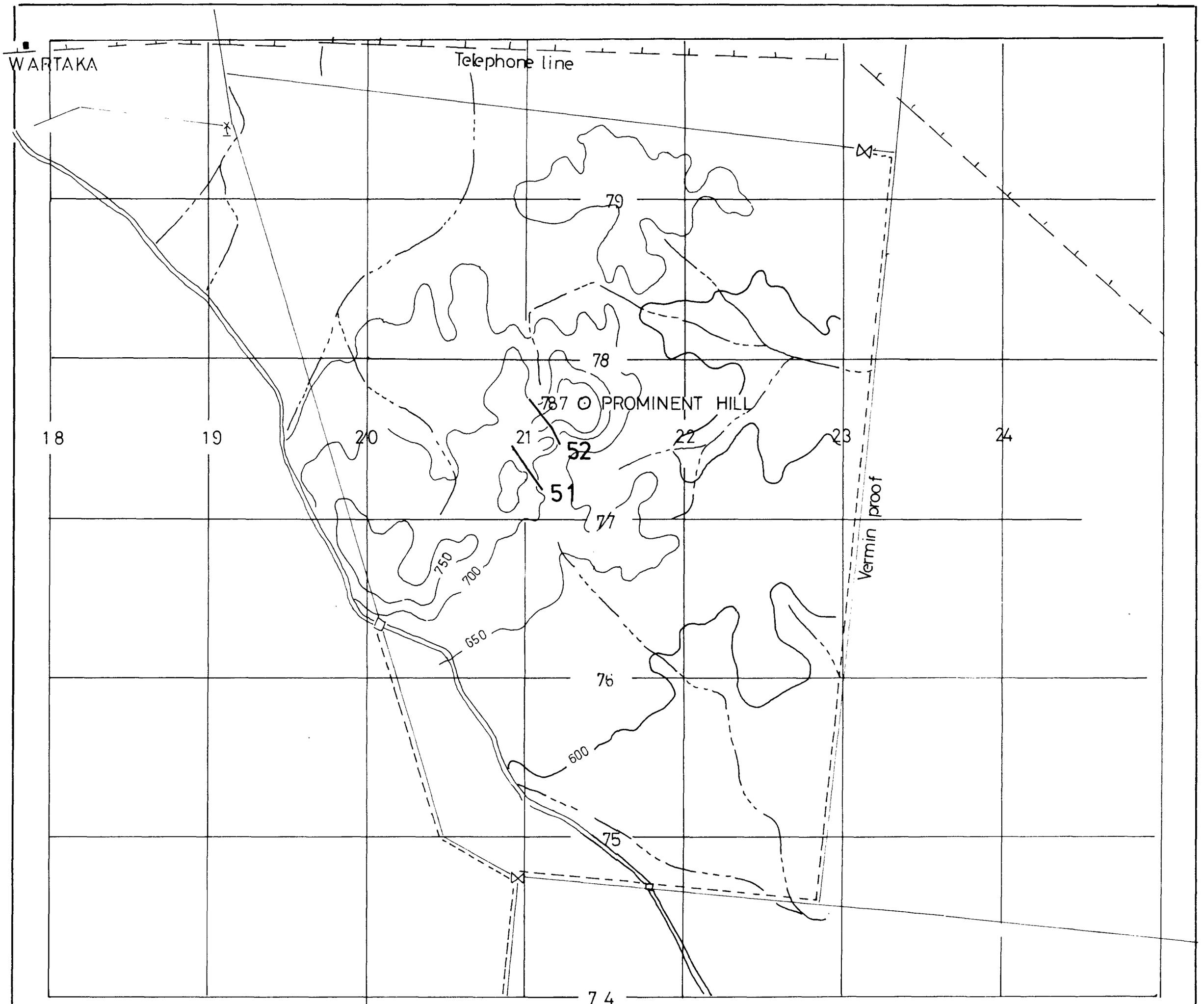
NISSHO IWAI Co.(Aust)Pty Ltd.

S. M.L. 498 Corunna

Locality Map of Radiometric Traverse Lines No. 21 - 33

AUTHOR	GEOLOGICAL SECTION of P.N.C. for NISSHO-IWAI	CHECKED S ARATANI	PLAN No. 412-C
		DATE AUG. 1971	

1520-16



0 500 1,000 2,000 M.

—76— MAP GRID No.

—51 Traverse & Section No.

Topography taken from CORUNNA 1:50,000

RECEIVED
30 AUG 1971
DEPT. OF MINES
SECURITY
1520-17

NISSHO-IWAI Co.(Aust.) Pty. Ltd.

S.M.L. 498

Locality Map of Radiometric Traverse Line No. 51 & 52

AUTHORS: GEOLOGICAL SECTION of P.N.C. for NISSHO-IWAI Co.	CHECKED S. ARATANI	PLAN No. 413 C
	DATE AUG. 1971	

1520-17

0081

FOURTH QUARTERLY REPORT

O N

SPECIAL MINING LEASE NO. 498

IN THE CORUNNA AREA

SOUTH AUSTRALIA

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

NOVEMBER 5, 1971

C O N T E N T S

0082

ILLUSTRATIONS

1. ABSTRACT

Following the third quarter period, prospecting works were intensively continued in charge of Minoru Koinuma, geologist of the Power Reactors and Nuclear Fuel Development Corporation (PNC) of Japan. Dr. S. Ishihara, geologist of the Geological Survey of Japan, also took part in the survey for 10 days in August.

The results of the surveys carried out in the western part of the lease in this term are summarized as follows:

Radiometric survey (1) Following-up of radioactive anomaly and (2) investigation on the stratigraphy of radioactive anomalous zones have been carried out. By the former it has been recognized that radioactivity is continuous throughout the area but it is weak. As for the latter, it has been found that the anomalous zones were distributed in a certain horizon.

Geologic survey (1) Investigation on the stratigraphy of Proterozoic sediments in the area and (2) investigation of geologic structure in the area of the Warwicks gulley. Stratigraphical investigation has revealed that some parts of red sandstone member grades into the lowermost member consisting of shale, fine-grained sandstone and quartzite as a result of contemporaneous hetero-facies. And geologic investigation made the complicated geological structure of the Warwicks gulley clear on the assumption that a supposed fault running in the direction of NW-SE obliquely crossing the West End Fault.

Radiometric logging Radiometric logging was carried out with a McPhar TV-5 radiation spectrometer in a percussion drill hole previously done by the B.H.P. Ltd., but radioactive anomaly detected there was much weaker than that measured in the Uno area.

2. SUMMARY OF PREVIOUS WORKS ON THE S.M.L. 498

On November 5, 1970, we were granted to survey the area of S.M.L. 498 (covering 145 square miles) which lies 20 miles west of the previously granted area of the S.M.L. 463 and is similar in geological feature to the latter. This special mining lease was established to explore sedimentary uranium ore deposits in the Corunna conglomerate of Late Carpentarian age. Under the direction of the exploration manager S. Aratani, geologists of the PNC of Japan carried out such field works, as carborne radiometric survey covering 250 linear kilometers as well as sampling and chemical analyses of water collected from wells, dams and boreholes inside and outside the lease. Stream sediments were also sampled and assayed. Uranium was not detected in stream sediments analyzed, while it was detected in most of the water samples examined, showing especially anomalous values in the samples collected from Gawler Range Volcanic area. Radiometric traverse line survey carried out at about the same time in the southern part of Corunna Hill revealed that radioactive anomaly was found in pebble conglomerate as in the case of the Uno area, but it was much weaker and the grey sandstone member was thinner than in the Uno area. The stratigraphic horizon of radioactive anomaly was recognized shifted up to a level adjacent to the quartzite member. The above-mentioned surveys were carried out in and before the second quarter period. During the third and the fourth quarters, we surveyed Corunna conglomerate in both northern and western parts of the lease. In parallel with the field works, samples collected were subjected to chemical analysis and mineralogical examination in the laboratory of the PNC of Japan. The investigation has determined that the radioactive anomaly was mostly due to thorium, and has confirmed that the thorium minerals are monazite and thorite. Uranium was scarcely detected.

3. GEOLOGICAL MAPPING IN THE WESTERN PART OF CORUNNA HILL

The Corunna conglomerate in the western half of the Corunna syncline is stratigraphically similar, in general, to that in the eastern half (Figs. 1 and 2) and is simply monoclinal in geologic structure, dipping at 15°-50° in the direction of NE at the N40°-60°W strike. The geologic sequence of the western half is as the following table.

Table 1. Geologic Sequence of the Western Part of Corunna Hill

Member	Thickness
Quartzite member	100 m -
Grey sandstone member	200 - 300 m
unconformity	
Red sandstone member	300 m
Lowermost member	50 m
unconformity	
Basement	

Lowermost member This member typically develops in the adjacent area of Tassie Creek, being composed of greenish grey to purplish shale, silty sandstone or laminated white coarse sandstone and of the uppermost greyish quartzite layer. Shale and silty sandstone are distributed in the area from Tassie Creek to Corunna Homestead, while they are rarely seen inserted in the red sandstone member around Homestead. White coarse sandstone is a rock constituting the white cliff of Mt. Murruy. It is a laminated feldspathic sandstone and often shows intraformational folding. The uppermost part of the member is greenish grey quartzite, which is distributed

on the top of Mt. Murruy and also forms the western foothill of Corunna Hill and a small monadnock in the west of it. These rocks show the same geologic structure as the overlying red sandstone. The lowermost member is a trasitional layer to the overlying red sandstone member and not less than 50 metres in thickness.

Red sandstone member As previously reported, the red sandstone member is mainly composed of conglomerate in the area from Corunna Homestead to Tassie Creek, showing a gradual increase in the ratio of sandstone toward the north. The western half of Corunna Hill from Corunna Homestead to West End Hill, excepting Mt. Murruy, consists of this member. The conglomerate of the red sandstone member near the Homestead consists of cobbles 10 centimetres in diameter of hematite or hematite quartzite, red chert, gneiss, schist and sandstone, and matrix of coarse-grained sandstone. The quantity of gravels in the member increases gradually from Tassie Creek to Corunna Homestead.

Grey sandstone member Unconformity is occurring between the grey sandstone and the underlying members. The grey sandstone member in the area is more remarkable in the development of conglomerate facies than that in the Uno area, and has the basal conglomerate containing gravels up to 30 centimetres in diameter. Gravels contained in the grey sandstone member become smaller in size toward the upper part, forming the sequence of layers from pebble conglomerate to coarse grained sandstone. The member is estimated to be approximately 300 metres in thickness. The conglomerate facies develops typically around the Warwicks gulley, and grades into pebble-bearing sandstone in the vicinity of Tassie Creek and West End Hill. The conglomerate of the grey sandstone member is monomictic, mostly consisting of white vein quartz in contrast to that the underlying red sandstone member containing

polymictic conglomerate. This member shows an alternation of pebble conglomerate and quartzite, being transitional to the overlying quartzite member.

Quartzite member This member is distributed in the eastern flank in the western wing of Corunna Hill, showing gentle incline. The member are composed of an alternation of pebble conglomerate in the lowermost part, massive quartzite, current bedded quartzose sandstone in the lower part, and mainly quartzite in the middle and upper parts. The member is estimated to be some 100 metres in thickness according to borehole data of the B.H.P.

Gawler Range volcanics The volcanics are distributed in a wide area from Warwicks to Wartaka, and, in addition, they are intruded into the red and the grey sandstone members at several places. Rocks of the volcanics mainly consist of porphyritic rhyolite.

Basement rocks The basement rock in the west of Corunna Hill is the Warrow quartzite which is a facies of the Cleve metamorphics and it is exposed in parallel with the range.

4. RADIOMETRIC SURVEY AND LOGGING

Each of the members in the area was surveyed for its radioactivity, including the grey sandstone member which had been known to have radioactive anomaly. The measured intensity is shown in Table 2.

Table 2. Radioactivity of Rocks

Rock units	Radioactivity (μr/h)	B.G. (μr/h)
Gawler range volcanics	25-50	25
Quartzite member	8-12	10
Grey sandstone member	10-15 (290)*	10
Red sandstone member	8-12	10
Lowermost member (quartzite)	5-10	10
(white sandstone)	10-20	10
(shale)	5-10	10
Basement (Warrow quartzite)	5-10	

* The figure in parenthesis shows the maximum observed intensity at a radioactive anomalous part.

As seen in the table, radioactive anomaly was not detected in any other members except the grey sandstone member. The radioactive anomalous zone in the uppermost part of the grey sandstone member could be followed nearly throughout the area. But we could not trace the anomaly by the surface survey in the area as completely as in the Uno area, because in the area the values measured were not sufficiently high and the anomalous zone was less than 20 centimetres in thickness. The highest radioactivity measured in the area was 290 μr/h.

Radiometric logging was carried out in a borehole which had been drilled by the B.H.P. Ltd. (Fig. 4). This hole was located in the central part of the Corunna syncline (Fig. 3), which was a valuable place for a underground radioactive measurement. Results of the logging showed that the radioactivity was weaker and the zone was thinner than in the borehole drilled in S.M.L. 463 of the Uno area. Radioactive peaks were observed in three layers in the

depth of 47 to 52 metres, supporting the results obtained by the surface survey mentioned above. By the logging, the depth to the upper boundary of the quartzite member was found to be 47 metres from the mouth of the hole.

5. GEOLOGICAL STRUCTURE

Boundary between the red and the grey sandstone members

From geologic survey carried out in the western wing of Corunna Hill, it is certain that there is unconformity between the red and the grey sandstone members. Results from which this conclusion came are: The origin of sedimentary rocks is different between the two members; There are boulders more than 30 cm in diameter on the boundary between them; Grey sandstone was found deposited on a place where more than one meter of sandstone had been eroded from the red sandstone member; Unconformity is clearly observed at the boundary between them in the Warwicks gulley.

Geological structure around Warwicks gulley

It has been known that there is the West End Fault running from south to north in the area. And it is considered to be necessary to establish another fault which is of NW-SE system and obliquely crosses the West End Fault. But further detailed survey would be necessary on geologic structure around the Warwicks gulley, because there remains many problems have to be solved.

6. SUMMARY AND CONCLUSION

Since we were granted to explore the S.M.L. 498, prospecting works have been carried out in various methods: surface radioactive survey, traverse line survey, geochemical survey of water and soil, chemical assay, and radiometric logging. The results obtained are summarized as follows:

(1) The status of bedded type radioacty anomaly in Protorozoic sediments of the Corunna area closely similar to that of the Uno area (S.M.L. 463).

(2) The radioactive anomalous zone could be followed well along a certain horizon. The zone, however, is much thinner in the lease than that in the Uno area.

(3) The radioactivity measured in the Corunna area was up to 600 μr/h, being much lower than that in the Uno area. Should we suppose that all the radioactivity measured is due to uranium, the specimen will be estimated as much as 0.06% U_3O_8.

(4) Most radioactive anomalous rocks collected by surface survey contain thorium minerals. The U/Th ratio in these rocks is nearly zero. No positive evidence has been obtained to show that the ratio will increase to the depth underground.

(5) It is estimated that there is a wide area of intrusion of Gawler Range volcanics in the central part of the Corunna syncline, and radioactive anomalous formation are missing there.

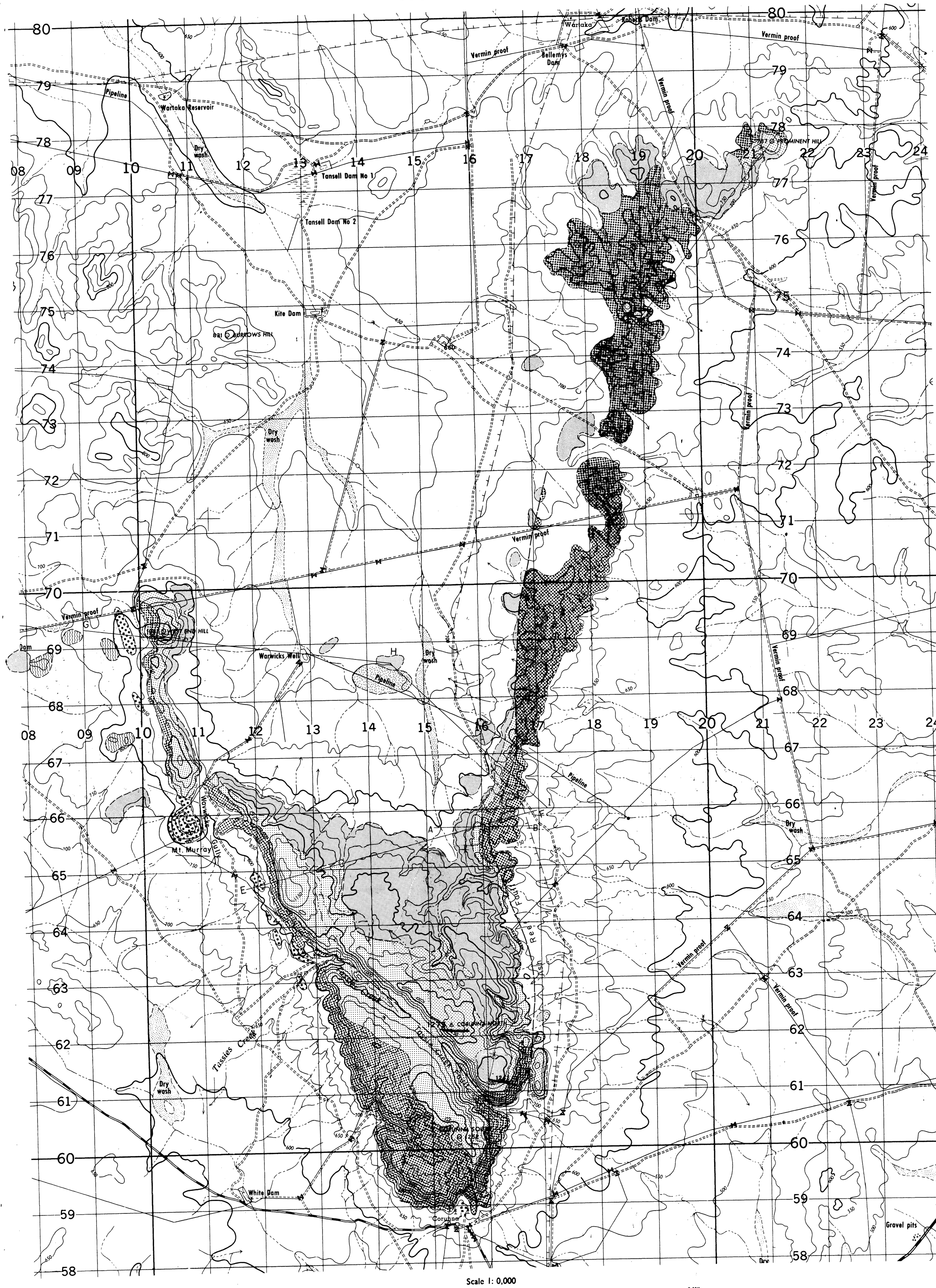
From the above-mentioned results, it is difficult to expect to find out a bedded type uranium deposit in the Proterozoic sediments of the area. Radioactive anomaly was also detected in some small area where Burkitt granite and Gawler Range volcanics are distributed in the lease. Though sufficient survey have not

been carried out there, we concluded that the radioactive anomaly would not tie up with a high grade uranium deposits.

On these accounts, we have no intention of continuing the exploration of uranium ores in S.M.L. 498 in the future and should like to release the lease at the expiry of the granting term.

CORUNNA

SOUTH AUSTRALIA



NISSHO-IWAI Co. (Aust.) Pty Ltd.

SML. 498 Corunna

GEOLOGICAL MAP OF CORUNNA HILL

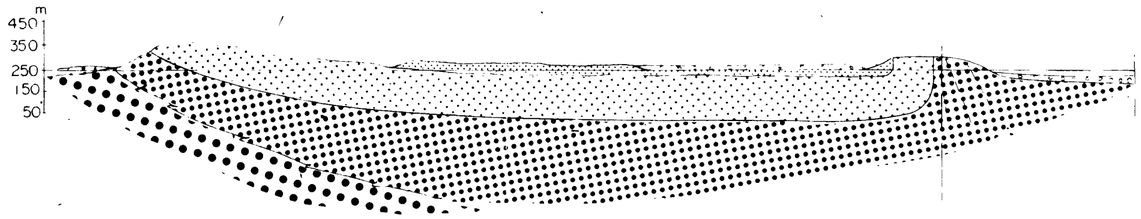
AUTHORS	GEOLOGICAL SECTION of PNC for NISSHO-IWAI	CHECKED S. ARATANI	PLAN No. C-414
DRAFTED		DATE NOV. 1971	

Fig. 1

1520 - 18

E

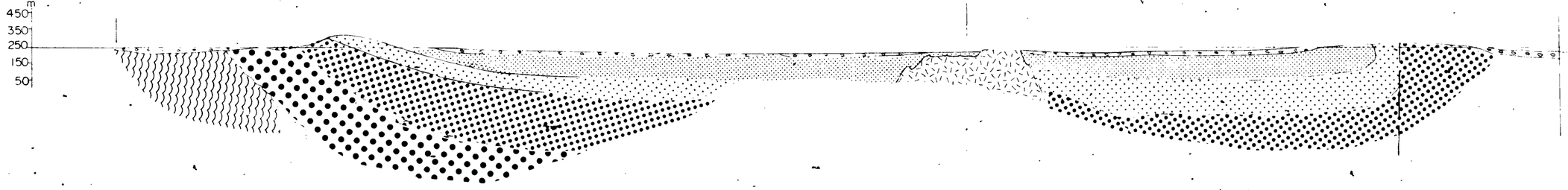
F



G

H

I



Soil

Quartzite

Grey Sandstone

Red Sandstone

Lowermost Member

Cleve Metamorphics

Gawler Range Volcanics

Fault

1/20,000

0 1,000 m

NISSHO IWAI Co.(Aust) Pty Ltd.

SML 498 Corunna

GEOLOGIC PROFILE OF WESTERN PART OF CORUNNA HILL

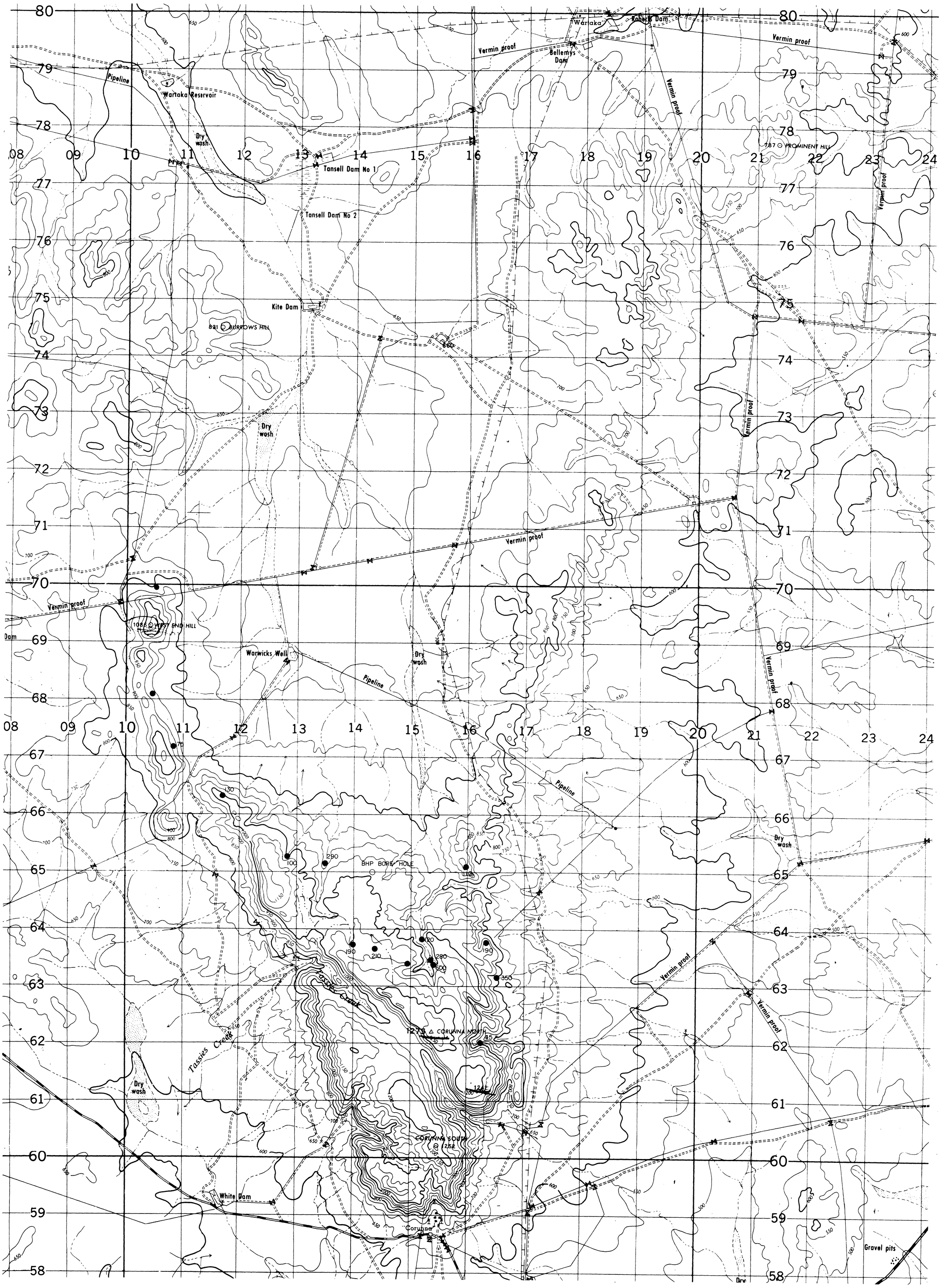
AUTHOR	GEOLOGICAL SECTION of PNC for NISSHO-IWAI	CHECKED S ARATANI	PLAN No
		DATE NOV. 1971	C-415

Fig. 2

1520-19

CORUNNA

SOUTH AUSTRALIA



Scale 1: 0,000

1 ½ 0 1 2 3 Miles

1000 500 0 1000 2000 3000 4000 Metres

1000 500 0 1000 2000 3000 4000 Yards

● Radioactive Anomaly (μr/h)

○ BHP Bore Hole

NISSHO IWAI Co.(Aust)Pty Ltd.		
SML. 498 Corunna		
MAP SHOWING RADIOACTIVE ANOMALY AND BHP BORE HOLE		
AUTHOR GEOLOGICAL SECTION of P.N.C. for NISSHO-IWAI	CHECKED S. ARATANI	PLAN No. C-416
	DATE NOV. 1971	

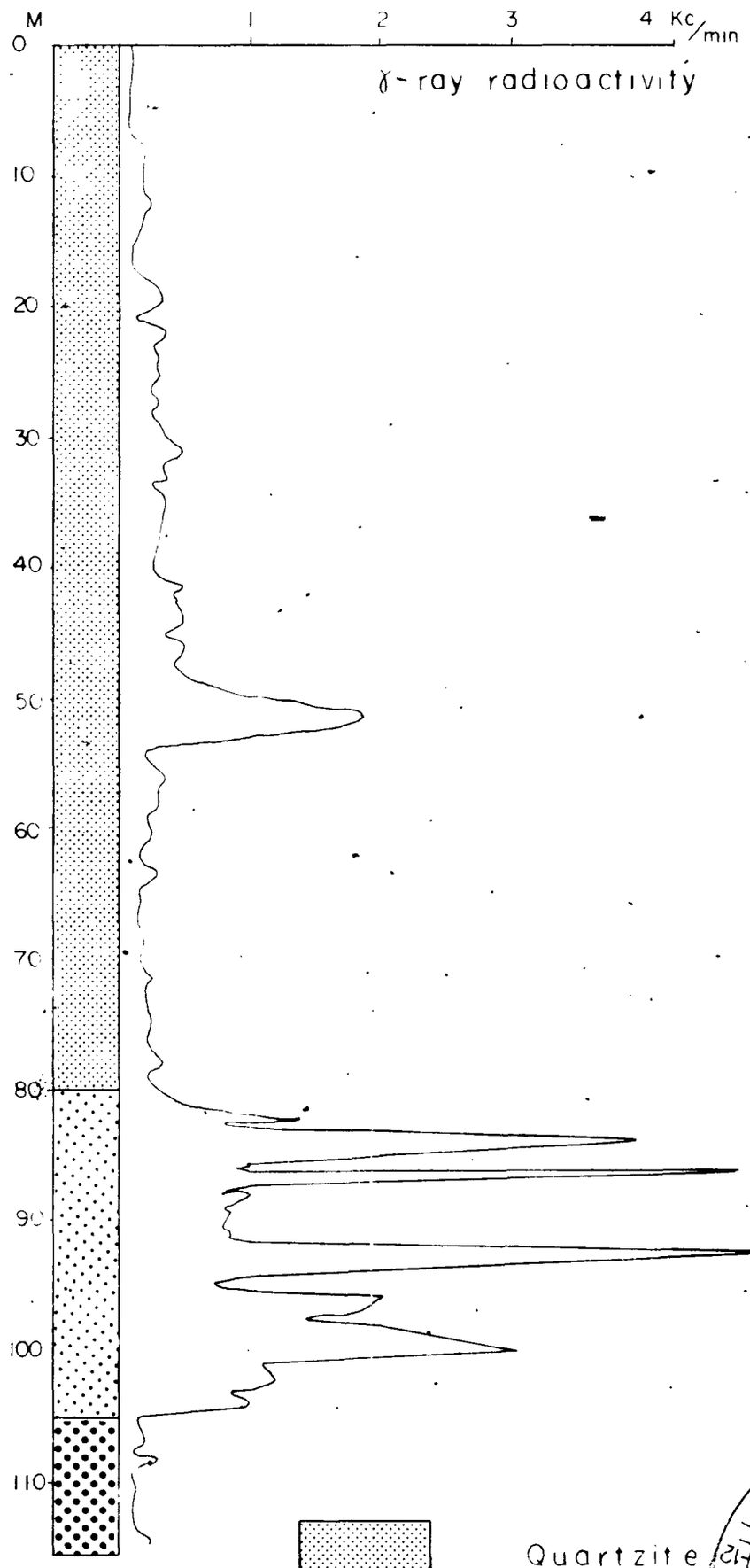
Fig. 3

UNO AREA (SML 463)

A-U-No.1

Range, T_2 (1.7 Mev) ; Kc/min Monitor; Mcphar Tv-5

B G ; 120 C/M T C , 3 Sec Prove ; Mcphar Tv-1



Quartzite

Grey ss

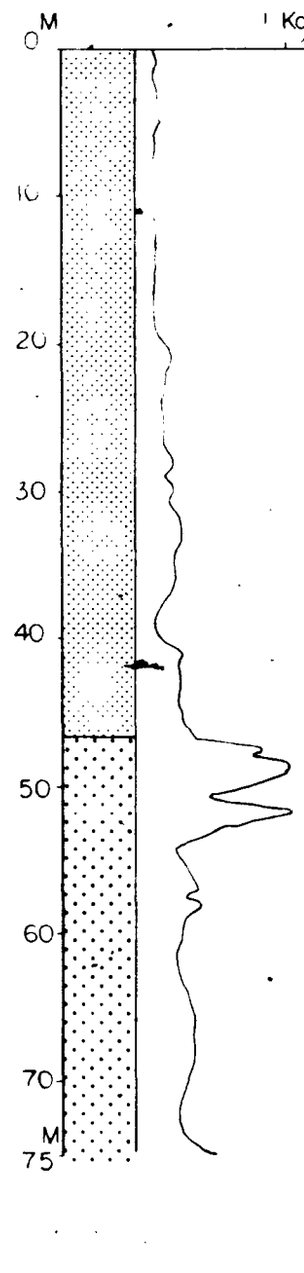
Red ss

CORUNNA AREA (SML 498)

BHP Bore hole

Range ; T_2 (1.7 Mev) 1 Kc/min Monitor ; Mcphar Tv-5

B G ; 150 C/M T C ; 3 Sec Prove ; Mcphar Tv-1



NISSHO IWAI Co. (Aust) Pty Ltd.

SML 498 Corunna

LOGGING DATA OF BHP BORE HOLE

AUTHOR	GEOLOGICAL SECTION of P.N.C for NISSHO-IWAI	CHECKED S. ARATANI	PLAN No
		DATE NOV. 1971	C-601

Fig. 4