495001

of M	A.O.	C.G.	E.O.	D.S.M.E
				Registrar
Received / Answered	22 NOV 1983			E & IL
DEPT. OF MINES REF. No 10,930/83				

THE SHELL COMPANY OF AUSTRALIA LIMITED

METALS DIVISION

E.L. 12/78 - SCAMANDER

Progress Report on Exploration During the Period

3/8/82 to 1/9/83

OPEN FILE

Author : P.A. Ruxton

Report No : 08.2067

Date : 1/10/83

Copy No : 1

Distribution :
1. Mines Department
2. BHP
3. BXHE/AHO
4. BXH/Devonport

CONTENTS

SUMMARY

1.0 INTRODUCTION

- 1.1 General
- 1.2 Exploration Philosophy & Objectives
- 1.3 Exploration History
- 1.4 Work Completed by S.C.O.A. (3/8/82 - 1/9/83)

2.0 REGIONAL GEOLOGY

- 2.1 Geology
- 2.2 Mineralization

3.0 STREAM SEDIMENT SURVEY

4.0 PROSPECT EVALUATION

5.0 RESEARCH

6.0 GEOPHYSICS

7.0 PINNACLES GRID

8.0 CONCLUSIONS & RECOMMENDATIONS

REFERENCES

APPENDICES

LIST OF FIGURES

FIGURE 1 : Great Pyramid Prospect Location Plan - Scale 1:250 000

FIGURE 2 : E.L. 12/78 Scamander Geology & Prospects

FIGURE 3 : E.L. 10/80 Great Pyramid Grids & Prospects - Scale 1:40 000

FIGURE 4 : Pinnacles/Pyramid Grids - Sn in Soils - Scale 1:10 000

FIGURE 5 : Pinnacles Grid - Stereonet Plot Northern end Bedding - Cleavage

FIGURE 6 : Pinnacles Grid - Stereonet Plot Northern end Fractures - Tourmaline-bearing veins

FIGURE 7 : Pinnacles Grid - Stereonet Plot Southern end Bedding/ Cleavage - fractures/veins

LIST OF PLANS

Plan No.	Title	Scale
BHP	Scamander E.L. 12/78 - Summary of Previous Exploration	As shown
LH 02/1000	Scamander E.L. 12/78 - Geology & Aeromagnetic Anomalies	1:20 000
D/LH 02/502	Scamander E.L. 12/78 - Stream Sediment Sample Locations	1:20 000
D/LH 02/503	Scamander E.L. 12/78 - Stream Sediment Survey Sn, W, Mo	1:20 000
D/LH 02/504	Scamander E.L. 12/78 - Stream Sediment Survey Cu, Pb, Zn	1:20 000
D/LH 02/505	Scamander E.L. 12/78 - Stream Sediment Survey As	1:20 000
D/LH 01/555 D/LH 01/556 D/LH 01/557	Pinnacles Grid - Soil Sample Results - Sn, WO_3, As	1:2 000
D/LH 01/558 D/LH 01/559 D/LH 01/560	Pinnacles Grid - Soil Sample Results - Cu, Pb, Zn	1:2 000
D/LH 01/526 D/LH 01/528 D/LH 01/527	Pinnacles Grid - Topography & Outcrop	1:2 000
D/LH 01/561 D/LH 01/562 D/LH 01/563	Pinnacles Grid - Lithology & Structure	1:2 000
D/LH 01/530 D/LH 01/564 D/LH 01/529	Pinnacles Grid - Mineralization/Tourmaline & "Pyramid-style" fracture distribution	1:2 000

LIST OF TABLES

TABLE 1 : Scamander Area - Summary of Previous Exploration

TABLE 2 : Previous Exploration - BHP 26/9/78 to 3/8/82

LIST OF APPENDICES

APPENDIX 1 : Stream Sediment Orientation Survey

APPENDIX 2 : Geological Notes on the West Pinnacles, East Pinnacles & Cramps Prospects

APPENDIX 3 : Rock Property Tests - Scamander

APPENDIX 4 : Regional Soil Orientation Survey

SUMMARY

The Shell Company of Australia Limited entered a Joint Venture with the Broken Hill Proprietary Company Limited in E.L. 12/78, Scamander and E.L. 10/80, Great Pyramid on 3/8/82.

This report is the first by the Shell Company describing activities in E.L. 12/78 between 3/8/82 and 1/9/83. The report summarizes previous exploration, outlines regional geology and presents work completed by the Shell Company.

Emphasis is placed on regional studies with a stream geochemical survey, geological mapping plus prospect evaluation and fluid inclusion and lithogeochemical research on vein systems in progress.

A grid was placed between Pyramid Hill and Loila Pinnacles. Soil geochemistry and mapping defined three zones of interest. Drilling will commence shortly.

495007

1.0 INTRODUCTION

1.1 General

Exploration Licence 12/78, Scamander of 276 sq km was initially granted to the Broken Hill Proprietary Co. Ltd. on 26/9/78. A Joint Venture Agreement between the Shell Company of Australia Limited and BHP commenced on 3/8/82. Shell is required to match BHP expenditure between the period 26/9/78 to 3/8/82 to earn a 50% equity. This is the first report by the Shell Company on E.L. 12/78 covering the period between 3/8/82 and 1/9/83.

The Scamander licence (E.L. 12/78) is located on the NE coast of Tasmania between Scamander and St. Helens (Fig. 1) and encloses Exploration Licence 10/80 Great Pyramid (12 sq km). Access is by sealed road to Scamander and St. Helens and subsequently by an excellent network of all weather graded forestry roads and fire trails. Vegetation is essentially open eucalypt forest (State Forest) and radiata pine plantations.

1.2 Exploration Philosophy & Objectives

The Scamander area is prospective for Sn - WO_3. Exploration is directed towards the search for:

a) Sheeted fracture/vein swarms - closely spaced mineralized fractures/veins (Great Pyramid type), and
b) Greisenized or altered granite - disseminated flat-lying and/or vein style mineralization in granite host-rocks.

495008

1.3 Exploration History

The numerous tin, copper, tungsten and silver shows in the Scamander area attracted many prospectors in the late 1800's and early 1900's. Total metal production from the area has been low with 2.9 tons of tin won from Pyramid Hill, 85 tons of copper from the Orieco mine and about 10,000 ounces of silver was recovered from a number of small silver shows. Old workings are common in the district with exploratory shafts, adits and trenches.

Systematic exploration began in 1959 when the Mt. Lyell and EZ Companies included part of the licence area with airborne magnetics. Subsequent work by EZ, Austminex, Geophoto, BHP, Rio Tinto, Consolidated Goldfields Australia and Scamander Mining is summarized in Table 1 and Plan BHP.

Exploration by BHP between 26/9/78 and 3/8/82 included airborne magnetic and EM surveys, a regional stream sediment sampling programme with work concentrating on the North Scamander prospect where 8 holes were drilled. The North Scamander Extended Grid was placed between Great Pyramid and North Scamander and the Cramps grid centred on a NW trending aeromagnetic anomaly between the Cramps and Dunns prospects. Traverse lines of soil sampling and magnetics were placed over aeromagnetic, stream sediment anomalies and prospects. This work is summarized in Table 2 and recorded in detail in Hine (1980), Hine (1981), Steele (1981) and Steele (1982).

495009

The North Scamander prospect was defined as a steeply dipping, NW trending, fault-related body between 5 and 10m wide consisting of massive pyrrhotite and magnetite with associated pyrite, sphalerite, galena and minor chalcopyrite. Assay results indicate best grades of 0.93% Sn over 1m (110 - 111m NS 2), 10.9% Zn and 6.2% Pb in NS 2. The distribution of Sn, Pb and Zn is highly erratic, related to chloritic/ magnetite/sulphide stringers and veins.

The aeromagnetic survey defined numerous anomalies. Northeast trending linear features are related to dolerite dykes and a large anomaly at North Scamander attributed to fault-related magnetite and pyrrhotite. Other anomalies were unexplained. (Refer Plan D/LH 02/1000).

No anomalies were identified from the Dighem survey.

Regional studies failed to outline any new prospects although several stream sediment anomalies were not followed up.

1.4 Work Completed by S.C.O.A. (3/8/82 - 1/9/83)

1. Compilation of all available geological data.

2. Stream sediment and soil orientation surveys over various prospects.

3. Initiation of a comprehensive stream sediment sampling programme (2-3 samples per km sq).

4. Detailed prospect evaluation - with completion of the East, West Pinnacles and Cramps prospects.

5. Commencement of a research project - M.Sc. at LaTrobe University Melbourne by Gavin Plummer under the control of Teunis Kwak and S.C.O.A. to study the fluid inclusion, history and litho-geochemistry of prospects.

6. Rock property tests on Mathinna Beds and granite samples.

7. Placement of the Pinnacles Grid NW of Pyramid Hill with over 30 km of grid line, soil sampling and mapping.

2.0 REGIONAL GEOLOGY

2.1 Geology

Mathinna Bed sediments form the dominant rock type in the Scamander licence (Refer Plan LH 02/1000). The occurrence of monograptus in Wrinkler Creek suggests a Siluro - Devonian age (Groves, 1972). The sediments consist of a bedded sequence of sandstones, siltstones and shales which display sedimentary structures - graded bedding, load casts, small scale lunate current ripple cross stratification, upper phase plane bedding - characteristic of deep water turbidite flysch deposits. No carbonates have been recognized in the succession. Bedding in the Scamander area generally trends NW and youngs and dips to the SW.

The Mathinna Beds were deformed during the Middle Devonian Tabberabberan Orogeny. All the sediments are folded and the siltstones and shales cleaved. Folds trend NW and plunge gently to the SE. They are dominated by large amplitude folds (wavelengths of 3 to 4 km) (Groves, 1972) with superimposed folds of

495011

smaller wavelengths (Ruxton, 1983). Major faults and shears trending NNW and NE are recognized.

Mathinna sediments were intruded by granitoids of the Blue Tier Batholith in the Upper Devonian. These granitoids range in composition from early hypershene -biotite adamellite of the St. Mary's Pluton, to hornblende-biotite granodiorite/adamellite of the St. Helen's Pluton and Scamander Tier Dyke, to biotite granite/adamellite of the Poimena and Mt. Pierson Plutons and finally to late stage two mica, alkali granites of the Lottah plutons and Constables Creek Sheet (Fig. 1). Tin mineralization is associated with late stage differentiated alkali granites. The Constables Creek granite sheet dips shallowly to the south forming a roof zone to the Mt. Pierson Pluton. This tin-bearing, two mica, tourmaline-bearing granite sheet probably underlies the Mathinna Bed in the Scamander licence.

Contact metamorphic effects include spotting and recrystallization in the Mathinna Beds. The degree of spotting to some extent depends on the initial chemistry of the sediment. The width of contact aureoles is generally measured in 100's of metres.

Thin dolerite/diorite dykes (10 to 20m thick) which trend NE across the licence area are associated with major faults and accompanied by linear aeromagnetic anomalies. The age of these dykes is not precisely known, they however, cross-cut Mathinna Bed sediments and are related to faults which displace the Scamander Tier Dyke. Alteration to amphibole and pyrite is common. Magnetic susceptibility measurements range upto $2{,}000 \times 10^{-5}$ cgs units.

495012

2.2 Mineralization

Several styles of mineralization occur in the area:

a) Sheeted fracture/vein type - close-spaced fractures bearing cassiterite on Pyramid Hill and Loila Tier(?) A deposit of approximately 8,000 to 10,000 tonnes of contained tin is estimated on Pyramid Hill (Ruxton, 1983).

b) Fault-related type - with chlorite/magnetite/ pyrrhotite stringers at North Scamander and Loila Pinnacles and gossanous supergene enriched fills at Dunns, Cramps, Ringarooma, Paul Beahr and Orieco prospects - Mathinna Bed host rocks. (Refer Location plan LH 02/1000).

c) Quartz vein lodes - bearing WO_3 and Mo at the Baden Powell, Prices and Lutwyche prospects.

d) Greisenized granite - altered granite related to fractures and veins - Sn plus WO_3 in quartz/ muscovite veins.

A broad mineral zonation from WO_3/Mo close to the granite in the NW to Sn/Cu and Pb/Ag was recognized by Groves (1972) (Fig. 2). This zonation is an over-simplification of a more complex system. It however suggests an increasing granite depth towards the SE of the licence and at surface a decreasing temperature of vein formation.

Of principal interest is a NW trending silicified ridge from Lutwyche/Pinnacles to Great Pyramid and North Scamander (Fig. 3). The Orieco ridge may be a parallel system in addition to a NW trending magnetic feature underlying the Dunns and Cramps prospects.

495013

3.0 STREAM SEDIMENT SURVEY

A stream sediment orientation survey was undertaken to determine the optimum size distribution of cassiterite in streams draining various prospects in the Scamander licence area. Details of the survey are included in Appendix 1. The results indicated that the -20# fraction yielded the best results for Sn, WO_3, Cu, Pb and Zn.

A regional stream sediment sampling programme is underway with the collection of -20# fraction samples for assay of Sn, WO_3, Cu, Pb, Zn and As. A panned concentrate was also collected at each site. Samples are taken from active stream sediment in catchment sites ammenable to optimum cassiterite (heavy mineral) concentration. Each sample site is described with the identification of rock types and sediment grain size. The contamination from old workings and introduction of cassiterite from Quaternary alluvials will be monitored.

Coverage of the North, Central, Northwest and Western portions of the licence are complete. The survey overlaps and repeats samples collected by Austminex and BHP. Austminex failed to assay for tin whereas BHP analysed two separate size fractions the -80# and -40# fractions. The present survey will enable a uniform coverage with greater control on sampling and results. Sample locations and results to date are presented in Plans D/LH 02/502-505.

4.0 PROSPECT EVALUATION

The documentation and evaluation of prospects is in progress to define more closely the style and nature of mineralization, the host rocks and the potential on surface and at depth of each mineral show. This information will be combined to give

495014

a regional picture. The work involves geological mapping of all old workings and outcrops in a prospect area with rock chip assays to define metals present. The East and West Pinnacles and Cramps prospects have been completed to date. (Appendix 2).

East Pinnacles - silicified medium grained sandstones of the Mathinna Beds with associated arsenopyrite and pyrite plus quartz and chlorite in fractures.

West Pinnacles - cassiterite in euhedral quartz and Fe-oxide filled fractures associated with silicified/fracture medium and fine grained sandstones. Minor chalcopyrite and muscovite is recorded.

Cramps - NNE trending fault-related Fe-oxides, silicification and minor scorodite staining of Mathinna Bed sediments. The similarity of rocks at this prospect and Dunns prospect suggests the occurrence of Cu/Pb/Zn sulphides at depth.

5.0 RESEARCH

Gavin Plummer commenced an M.Sc. project in February, 1983. The project is partly financed by Shell/BHP and directed by Tuenis Kwak (LaTrobe University, Melbourne) and SCOA/BHP. The aim of the project is to define the fluid inclusion history and lithogeochemistry of the zoned Scamander mineral field. In an economic sense fluid inclusion data on surface may point to Sn or WO_3 mineralization at depth. In an acedemic sense the Scamander area is ideal for the study of zoned vein deposits related to tin-bearing granites since granites outcrop and veins are well exposed.

The compilation of regional geology, stream sediment survey data, evaluation of prospects and fluid inclusion/lithogeochemical studies will provide information both of economic and acedemic interest.

495015

6.0 GEOPHYSICS

Seven rock samples from the Mathinna Beds and Constables Creek Granite Sheet were sent to Prof. Don Emerson (Sydney University) for rock property tests. The results are shown in Appendix 3.

7.0 PINNACLES GRID

A grid was placed between Loila Pinnacles and the Pyramid Grid totalling 22 line/kilometres. Soil sampling revealed several interesting zones and 11.85 line/kilometres of infill lines were placed. The baseline was surveyed in with a theodolite and chain. Cross-lines were turned off with the theodolite and continued with ranging poles, compass and chain. The grid was soil sampled and geologically mapped.

50m spaced soil samples were taken using hand augers and small hoes to combat the problems of soil creep on the steep slopes of Loila Pinnacles. A regional soil orientation survey suggested that a coarse size fraction (-10#) was the best sample for element concentration (Appendix 4). Pinnacles Grid soil samples were assayed for Sn, WO_3, Mo, As, Cu, Pb, Zn and Ag using the -10# fraction. The results are presented in Plans D/LH 01/555-560.

Soil geochemistry defines three areas of anomalous Sn (>100 ppm Sn): (Fig. 4, Plan D/LH 01/555-557).

Zone A - In the northern part of the grid. A zone 1000m long (elongate SSE) and 600m wide with a maximum value of 0.14% Sn in soils. This zone has a coincident As anomaly, Cu halo and partly coincident Zn in soil anomaly.

495016

Zone B - In the north and central parts of the grid. A zone elongate WNW to ESW, 1200m long and 300 - 400m wide with a maximum value of 0.16% Sn. The northern 400m of Zone B is coincident with the northeastern portion of Zone A. Coincident Pb and Cu anomalies with extensions (haloes) of Zn and As are recognized.

Zone C - Located 200m from the Pyramid Grid. A zone of 200m x 250m which remains open to the SW with a maximum value of 740 ppm Sn. This zone has a coincident Cu, As and Zn anomaly.

Four structural trends are apparent from the data:

1) NNW - SSE (345°). The main trend of Zone A. This trend is slightly oblique to bedding and cleavage trends but parallel to a quartz vein fracture set.

2) WNW - ESE (285°). The main trend of Zone B. This trend is oblique to bedding and cleavage but parallel to the fault zone on the top of Pyramid Hill.

3) NNE - SSW (020°). This trend is coincident to quartz/tourmaline/cassiterite veins.

4) ENE - WSW (080°). This trend is parallel to the dominant fracture set.

The Pinnacles Grid was geologically mapped. Outcrop is poor on the southern portion of the grid (1000W to 00W) in contrast to abundant rock exposure around Loila Pinnacles. The grid covers Mathinna Bed sediments consisting predominantly of siltstones and shales with minor sandstone beds. In the northern half of the grid (1000W to 2000W) the rocks are commonly silicified and fractured. Bedding generally strikes NW and dips steeply NE and SW (Refer Plans D/LH 01/561-564 and 529 plus 530).

The beds are folded into tight cylindrical folds with near vertical NW trending axial planes, steep fold limbs and narrow fold curvatures which plunge gently SE (Fig. 5). Siltstone and shale units are commonly strongly cleaved, cleavage planes trending NW and dipping steeply NE and SW. (Figs. 5, 7).

Fracturing and veining is common in sandstones and siltstones on the northern half of the Pinnacles Grid. (Refer Plans D/LH 01/529, 530 & 564).
There are three major fracture sets approximately perpendicular (Figs. 6, 7):

a) NE striking and steeply SE dipping fractures (parallel to the mineralized fracture set on Pyramid Hill) - this is the dominant set.

b) NNW striking and steeply ENE to WSW dipping (also recognized on Pyramid Hill).

c) Flat-lying fractures (less common than on Pyramid Hill).

These fracture sets contain euhedral quartz and iron oxide fills (sulphides at depth?) with rare tourmaline and cassiterite. The coincidence of the major fracture sets on the Pinnacles and Pyramid grids suggests formation in response to regional stresses.

An area of cassiterite-bearing tourmaline, tourmaline/quartz and quartz veining coincides with the Sn-in-soil Zone A anomaly. (Refer Plans D/LH 01/530,529).
These veins trend NNE and dip steeply SE (Fig. 6) and can be seen to be locally parallel and elsewhere to cross-cut NE trending SE dipping fractures. The general vein trend is slightly oblique to the NE fracture set (Fig. 6). Crystalline cassiterite ranges upto 1cm across, varies in colour from

ruby red to pale green/colourless and has an irregular distribution within the veins themselves. This cassiterite-bearing vein system is considered to be produced in response to regional stress.

Tin mineralization is further related to pyramid-style NE trending fracturing in Sn-in-soil Zone B anomaly (although cassiterite grains are hard to see assays of rock chips give maximum Sn values of 890 ppm) and to magnetite-bearing fault gauge material on the top of Loila Pinnacles with an assay value of 1.97% Sn from gossanous rockchips. The West Pinnacles Prospect (adit) is located in the Sn-in-soil Zone B (and at the eastern margin of the Zone A anomaly) (Refer Plan D/LH 01/529). and consists of cassiterite related to NE trending fractures with euhedral quartz fills, Fe oxides and trace chalcopyrite (Appendix 2). The East Pinnacles Prospect (adit + trenches) is not located within a Sn-in-soil anomalous zone and consists of arsenopyrite/pyrite-bearing silicified medium grained sandstones.

8.0 CONCLUSIONS & RECOMMENDATIONS

A regional programme involving stream geochemical sampling, geological mapping plus prospect evaluation, fluid inclusion and lithogeochemical studies of veining and geophysical followup is in progress to determine the economic potential of the Scamander Licence.

Gridding, soil geochemistry and mapping of the area between Pyramid Hill and Loila Pinnacles has outlined three zones of interest. Drilling will proceed in Sn-in-soil Zone A anomaly shortly.

REFERENCES

GROVES, D.I. (1972). The zoned mineral deposits of the Scamander - St. Helens District. Tas. Dept. Mines. Geol. Surv. Bull. 53.

HINE, R. (1980). Progress report on exploration of E.L. 12/78, Scamander, Tasmania - between 15th Sept. 1979 and 15th Mar. 1980. Unpubl. BHP Co. Rep.

HINE, R. (1981). North Scamander prospect. Report on drilling - July to September, 1980. Unpubl. BHP Co. Rep.

RUXTON, P.A. (1983). Progress report on Exploration of E.L. 10/80, Great Pyramid 3/8/82 to 1/9/83. Unpubl. Shell Rep.

STEELE, D. (1981). Progress report on exploration for the six months ending 15th Sept. 1981. Unpubl. BHP Co. Rep. E.L. 12/78.

STEELE, D. (1982). Progress report on exploration for the six months ending 15th March, 1982. Unpubl. BHP Co. Rep. E.L. 12/78.

TABLE 1

SCAMANDER AREA - SUMMARY OF PREVIOUS EXPLORATION

COMPANY	YEAR	PROSPECT/AREA	WORK COMPLETED	RESULTS/COMMENTS
Lyell-E.Z.	1959-1962	Fingal-Scamander	- airborne magnetics, E.M. - follow-up anomaly 3/6, North Scamander - I.P., ground magnetics, McPhar R.E.M. rock sampling, 1 DD hole of 150' at North Scamander	-hole FP102 North Scamander intersected 6' of 1.5% Pb, 4.4% Zn, 0.1% Cu, 30 ppm Ag 120' -no Sn analyses
B.H.P.	1965	North Scamander Pinnacles	- rock chip sampling, soil sampling - magnetics, soil sampling, 6 shallow percussion holes	-dump samples returned values less than 0.01% Sn
Austminex	1965	Scamander regional	- stream samples (Sn, Zn, cold ext. Cu, Mo, heavy metals)	-no significant anomalies outside known areas
Geophoto	1969	Scamander regional	- stream sampling (-20# Mo, Bi - 80# Cu, Pb, Zn, Ag) - airborne radiometric survey - digital fracture analysis	-digitized data for Tl^{208}, Bi^{214}, K^{40} Pb, Zn, Mo, Ag, Bi
Geophoto	1970-1971	Constables Creek/Echo	- soil sampling (Mo, Bi, W, Sn) - 5 DD holes - Cobra drill rock sampling	-narrow intersections low grade Sn (to 0.3%) W (to 0.2%), Bi (to 0.2%), to 70 ppm Mo
C.G.F.A.	1967	Loila Tier	- dug pits, costeans	-Sn, W mineralization similar to Pyramid
Rio Tinto	1957	Scamander Flats	- alluvial testing	
Geophoto	1971-1972	Lutwyche	- gridding, trenching, rock chip sampling (Mo, Bi, Sn, W) - 4 DD holes (Cu, Mo, Bi, W, Sn)	-some high grade patches tungsten -narrow quartz veins
Geophoto	1970	South Pyramid	- trenching, rock chip samples (78)	-Sn range 0.05-1.18% Sn
Geophoto	1972	Wolfram Creek (Baden Powell?)	- gridding, soil sampling (Sn, W, Mo, Bi) - Cobra drill sampling	-soils consistently going 0.14% Sn
Scamander Mining		Orieco Mine	- regional mapping - rock sampling (Cu, Pb, Zn) - 2 DD holes	-no Sn results; narrow massive sulphide intersections

TABLE 2

PREVIOUS EXPLORATION - BHP 26/9/78 to 3/8/82

1. Aeromagnetic coverage of E.L. 12/78 and E.L. 10/80. Helicopter borne, 1200 line/km 90m terrain clearance, E-W lines 300m apart mid 1979. GEOEX.

2. Dighem II survey centred on North Scamander prospect. Helicopter borne, 115 line/km, E-W lines early 1980.

3. Regional mapping.

4. Stream sediment sampling - 2 surveys, -40# and -80# fractions analysed centred on NW and SW of licence.

5. Rock chip sampling - prospects + regional.

6. NORTH SCAMANDER PROSPECT
   - Grid, soil sampled, mapped.
   - Ground magnetics/Sirotem TEM/IP/SP
   - Diamond drilled 4 holes NS 1-4
   - Percussion drilled 4 holes NSP 1-4 (max. depth 50m) downhole IP, mise a la masse + petrology on core

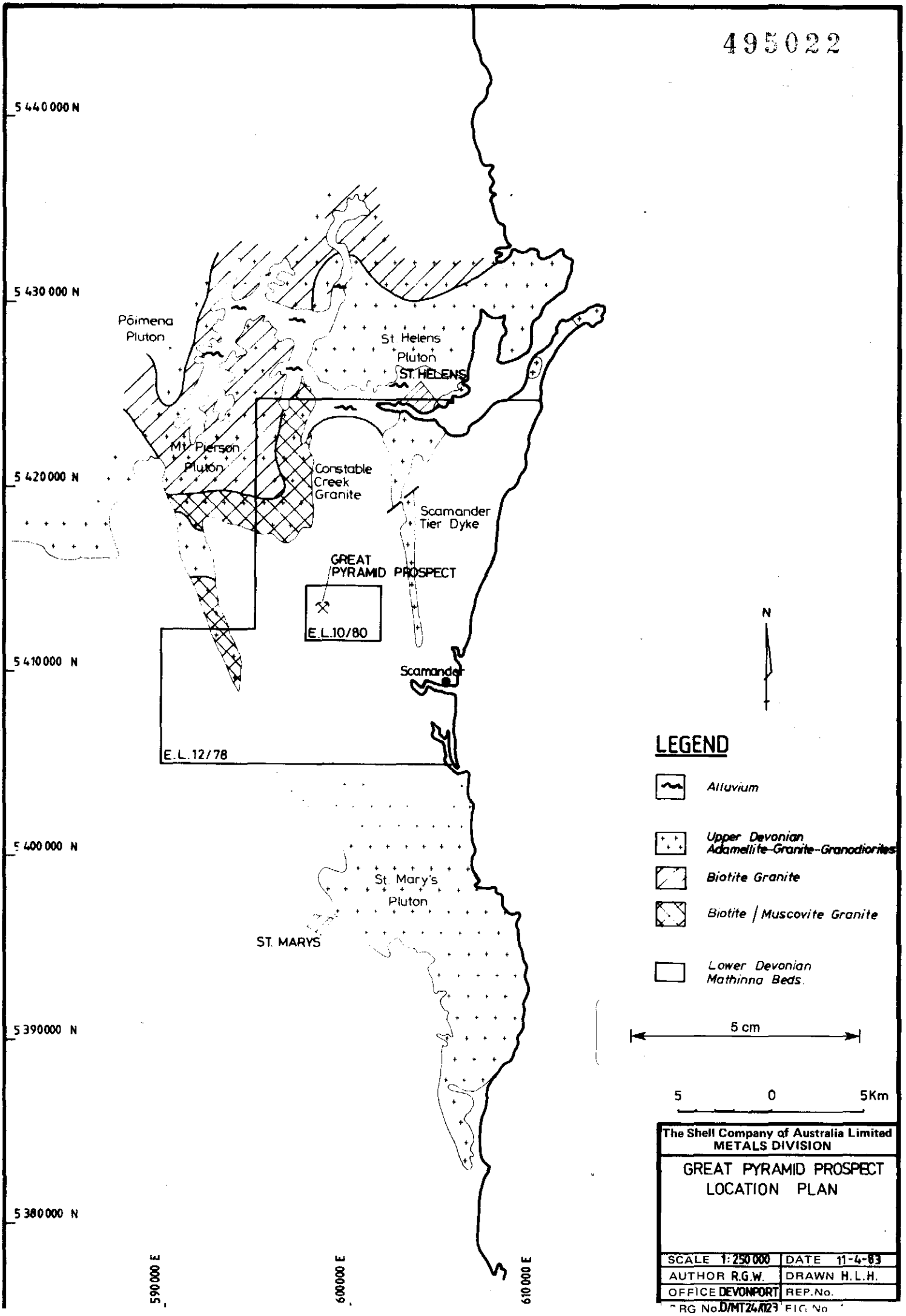
7. CRAMPS GRID
   - Straddles Cramps and Dunns prospects
   - Gridded - soil sampled - ground magnetics plus geological mapping

8. North Scamander Extended Grid
   Between Pyramid and North Scamander grids.
   Soil sampled, mapped.

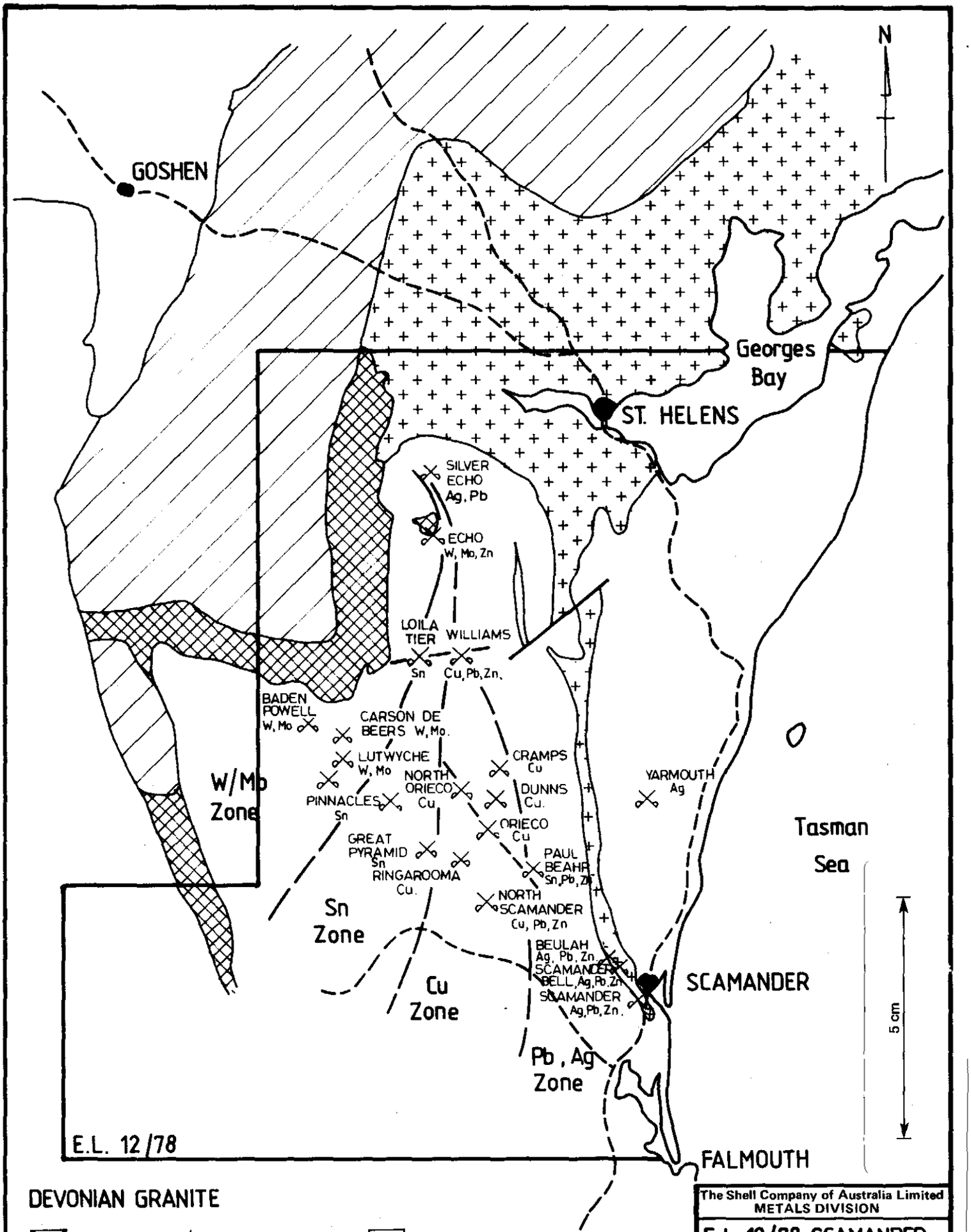
9. Ridge Crest rock chip/soil traverses.
   a) Orieco South/Pitts Hill
   b) Orieco Ridge.

10. Aeromagnetic/prospect follow-up.
    Traverse lines of soil sampling and magnetics covers 17 aeromagnetic anomalies plus Baden Powell, Yarmouth and Lutwyche prospects - also stream sediment anomaly in N Wolfram Creek area.

495022



The Shell Company of Australia Limited METALS DIVISION	
GREAT PYRAMID PROSPECT LOCATION PLAN	
SCALE 1:250 000	DATE 11-4-83
AUTHOR R.G.W.	DRAWN H.L.H.
OFFICE DEVONPORT	REP.No.
DRG No. D/MT24/023	FIG No.



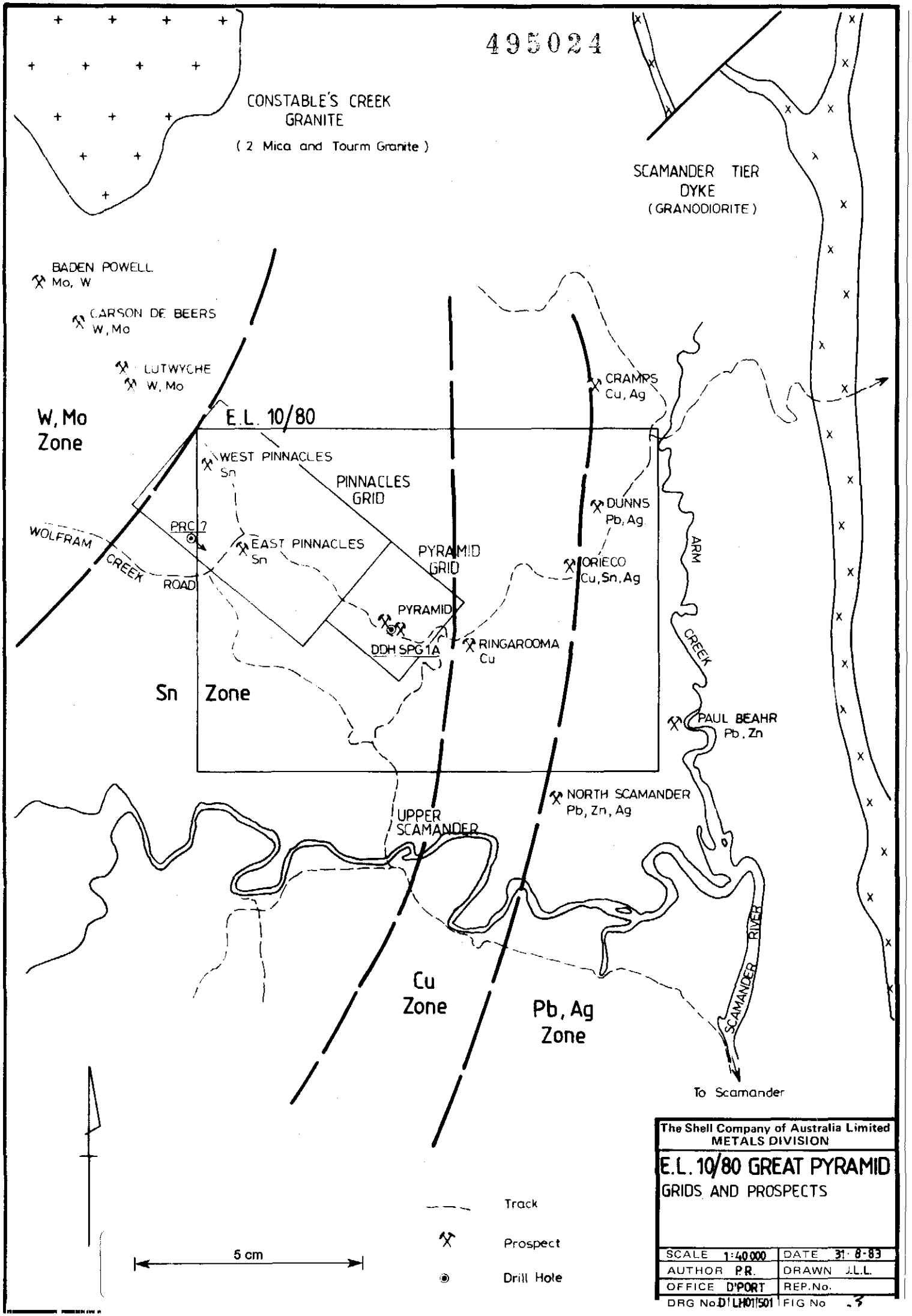
495023

The Shell Company of Australia Limited
METALS DIVISION

E.L. 12/78 SCAMANDER GEOLOGY & PROSPECTS

SCALE AS SHOWN	DATE 13/4/83
AUTHOR P.A.R.	DRAWN J.L.L.
OFFICE D'PORT	REP.No.
DRG No LH02/500	FIG No 2.

495024



The Shell Company of Australia Limited
METALS DIVISION

E.L. 10/80 GREAT PYRAMID
GRIDS AND PROSPECTS

SCALE 1:40 000	DATE 31·8·83
AUTHOR P.R.	DRAWN J.L.L.
OFFICE D'PORT	REP. No.
DRG No. D'LH01/501	FIG No. 3

PINNACLES
GRID
HAND AUGERED
-10# FRACTION

PYRAMID
GRID
SURFACE SAMPLES
-40# FRACTION

ZONE A
ZONE B
ZONE C

LOLA PINNACLES
WEST PINNACLES ADIT
PRC 1
PRC 2
PRC 3
PRC 4
PRC 5
PRC 6
PRC 7
PRC 8
PRC 9
PRC 10
PRC 11
PPH 1
SPG 1

100
300
500
0·1%
0·3%
0·5%

5 cm

TN MN

0 500 m

Location of Reverse Circulation Drillholes
PRC 1-11 Pinnacles Grid

Contour Values :
> 0·5 %
0·5 %
0·3 %
0·1 %
500 p.p.m.
300 p.p.m.
100 p.p.m.

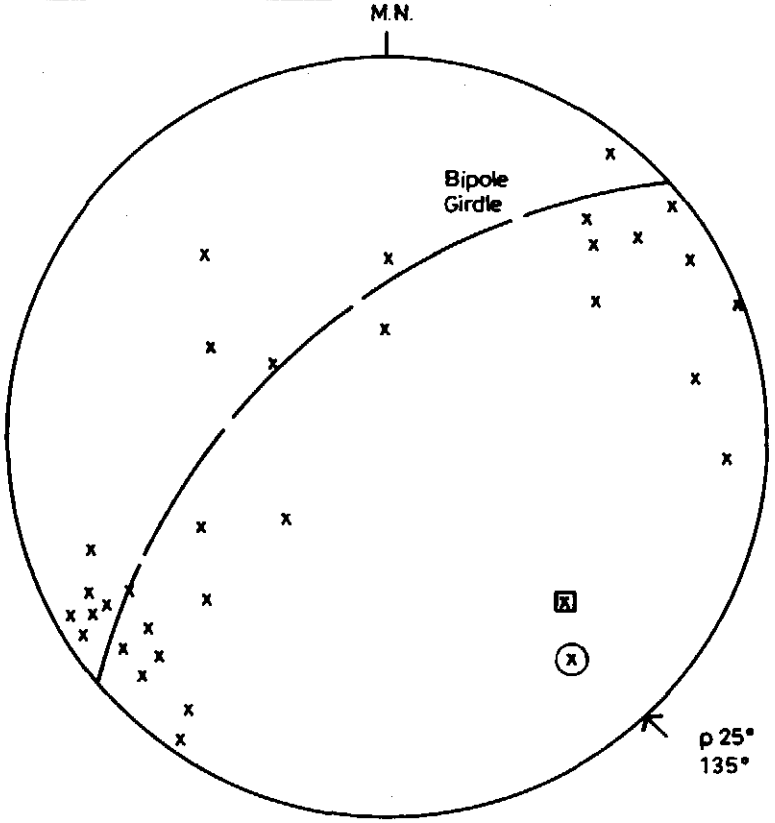
The Shell Company of Australia Limited
METALS DIVISION

PINNACLES / PYRAMID GRIDS
Sn in SOILS

SCALE	1:10000	DATE	22-9-83
AUTHOR	P.A.R.	DRAWN	J.L.L
OFFICE	DEVONPORT	REP.No.	
DRG No	D/LH02/506	FIG No	4

495026

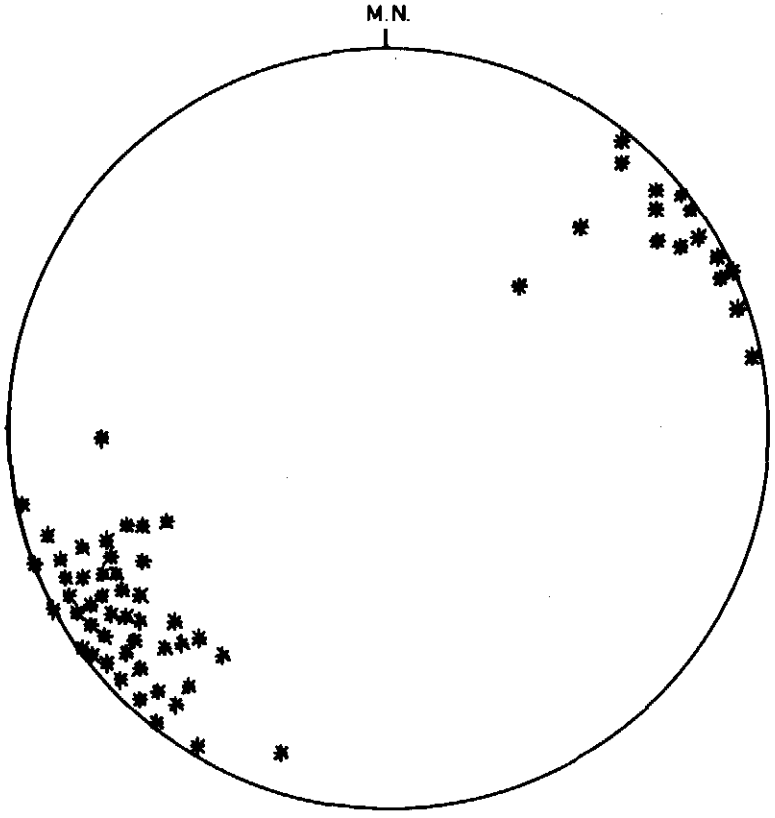
BEDDING



x, n = 32

⊠, n = 1

CLEAVAGE



*, n = 65

x *BEDDING*

* *CLEAVAGE*

(x) *FOLD AXIS (AVERAGE)*

⊠ *MINOR FOLD AXIS*

LAMBERT EQUAL – AREA NET

POLES TO PLANES

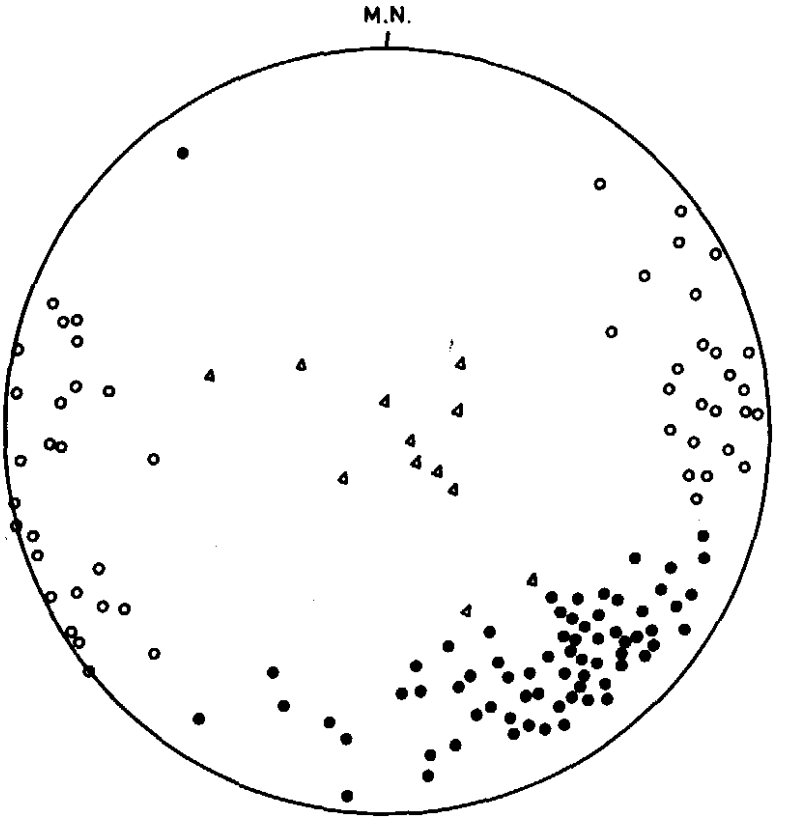
The Shell Company of Australia Limited
METALS DIVISION

E.L. 12/78 SCAMANDER
PINNACLES GRID
NORTHERN END
STEREONET PLOT

SCALE	DATE 23-9-83
AUTHOR P.A.R.	DRAWN J.L.L.
OFFICE D'PORT	REP.No.
DRG.No. D/LH02/508	FIG.No. 5

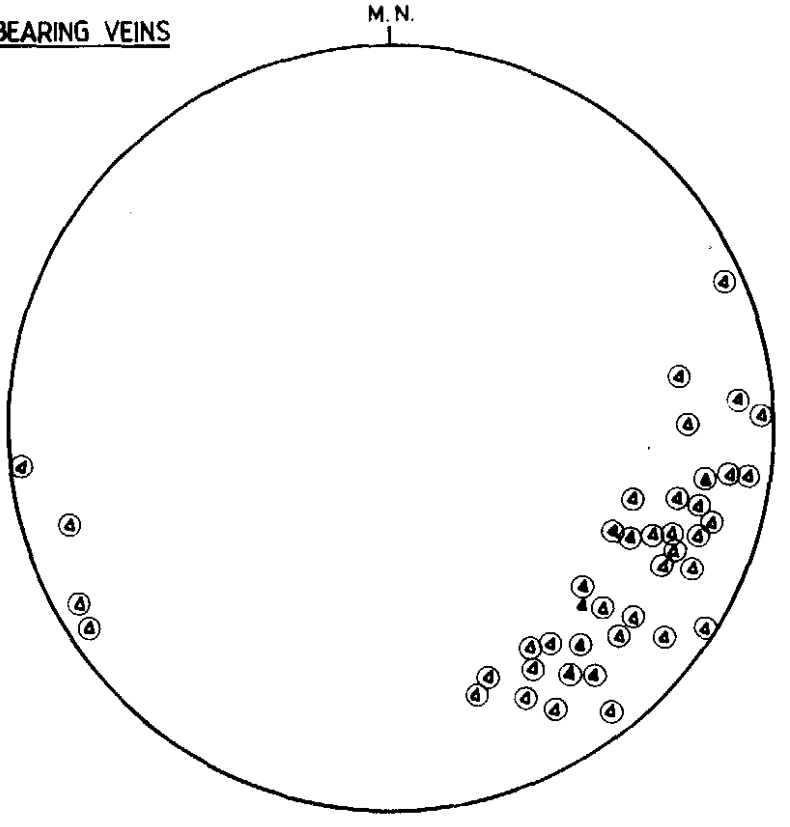
495027

FRACTURES



● n = 69
○ n = 51
▲ n = 12

TOURMALINE BEARING VEINS



Ⓐ n = 33
Ⓐ n = 8

● *SELECTED ENE FRACTURES*

○ *NNW TENDING FRACTURES*

▲ *FLAT - LYING FRACTURES*

Ⓐ *TOURM. QTZ. & TOURM. FRACTURES / VEINS*

Ⓐ *TOURM / QTZ / CASS FRACTURES / VEINS*

LAMBERT EQUAL - AREA NET

POLES TO PLANES

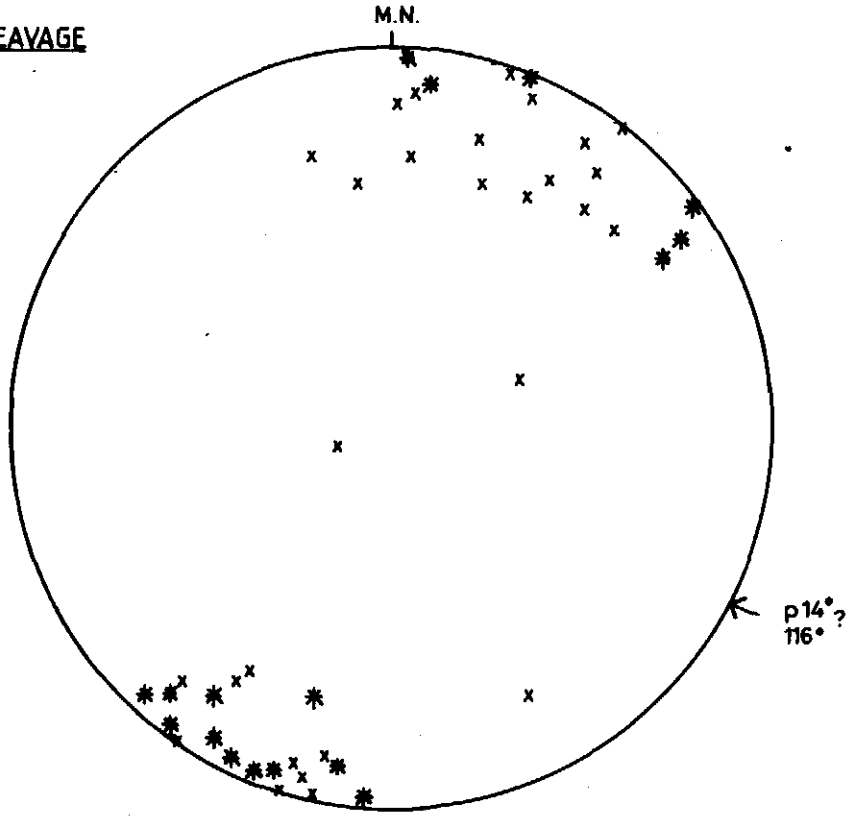
The Shell Company of Australia Limited
METALS DIVISION

E.L. 12/78 SCAMANDER
PINNACLES GRID
NORTHERN END
STEREONET PLOT

SCALE	DATE 23-9-83
AUTHOR P.A.R.	DRAWN J.L.L.
OFFICE D'PORT	REP.No.
DRG No. D/LH02/509	FIG.No. 6

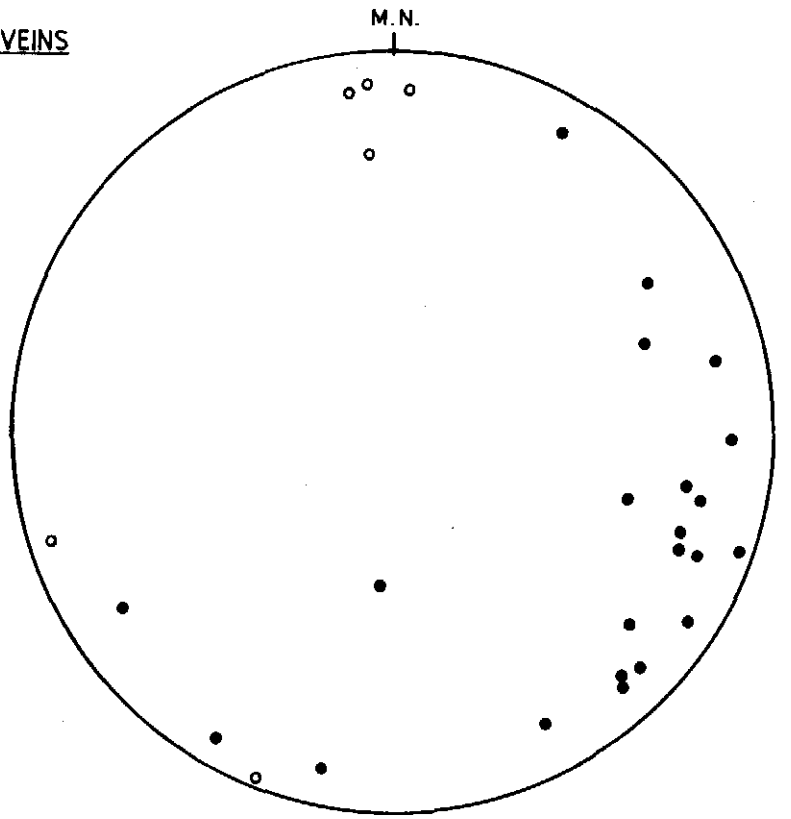
495028

BEDDING AND CLEAVAGE



*, n= 18
x, n= 26
⊠, n= 2

FRACTURES AND VEINS



●, n = 23
°, n = 5

x *BEDDING*

* *CLEAVAGE*

⊠ *MINOR FOLD AXES*

● *FRACTURES*

o *QUARTZ VEINS*

LAMBERT EQUAL-AREA NET

POLES TO PLANES

The Shell Company of Australia Limited
METALS DIVISION

E.L. 12/78 SCAMANDER
PINNACLES GRID
SOUTHERN END
STEREONET PLOT

SCALE	DATE 23·9·83
AUTHOR P.A.R.	DRAWN J.L.L.
OFFICE D'PORT	REP.No.
DRG No D/L.H0[illegible]	FIG No 4

APPENDIX 1

Stream Sediment Orientation Survey

STREAM SEDIMENT ORIENTATION SURVEY

495030

A stream sediment orientation survey was conducted across the Scamander Licence to try and define the optimum size fraction(s) of tin and other economic elements in streams draining known prospects. 14 samples were collected. In each case the best catchment available was sampled. Six size fractions were sieved from each sample:

A sample	- 5# + rest
B sample	-10# + rest
C sample	-10# + 20#
D sample	-20# + 40#
E sample	-40# + 80#
F sample	-80#

each sample fraction was assayed by Comlabs for:

XRF 1	Sn, W, Mo, Bi, As
AAS 1	Cu, Pb, Zn
AAS 2	Fe, Mn
AAS 3	Ag

A total of 84 samples were made. The sample locations, descriptions and results are attached.

Results: All elements (except Mo, Bi, As and Fe) are preferentially concentrated in the finer sediment fractions (-20# + 40#, -40# +80# and -80#). Sn is highlighted in the -20# +40# and -40# +80# size fractions although the -20# +rest sample is considered to give the most consistent results. The inference that Sn is coarser closer to its source can also be made. WO_3, Cu, Pb, Zn and Ag are generally confined to the -20# +rest fractions with the background values of WO_3 and Ag below detection. As and Fe tend to concentrate in the coarser and grab fractions. Bi and Mo peak values are erratic and generally less than 2x the background/detectable value s.

Conclusions and Recommendations

All elements (except Mo, Bi, As and Fe) tend to concentrate in the finer sediment fractions (-20# +40#, -40# +80# and -80#).

All samples will be collected from the best catchment sites available and sieved to -20#. The following elements will be measured Sn, WO_3 Cu, Pb, Zn. Results will be listed on paper and stored on magnetic tape.

STREAM SEDIMENT SAMPLE LOCATIONS

Estimated accuracy

SS01 - PYRAMID HILL - North side of N. Block Pyramid Hill (Poor Catchment - dry creek - float 100% Mathinna Beds). 3901 ±100m

SS02 - PYRAMID HILL - Northwest side of N. Block Pyramid Hill (V. good catchment - dry creek - float 100% Mathinna Beds). 3902 ±100m

SS03 - PYRAMID HILL - Southern side of N. Block Pyramid Hill (Poor catchment - dry creek - float 100% Mathinna Beds). 3903 ±100m

SS04 - PYRAMID HILL (distal) - Kelly's Creek a few metres above bridge on Eastern Creek Road. (Outcropping Mathinna Beds - creek flows). 3904 100 ±50m

SS05 - PINNACLES - just below West Pinnacles adit (catchment ok dry creek - float 100% Mathinna Beds). 3905 ±100m

SS06 - PINNACLES (distal) - same creek as SS05 just above Wolfram Creek Road. (Poor catchment - flowing - 100% Mathinna Beds float). 3906 100 ±50m

SS07 - LUTWYCHE - directly below the Lutwyche Prospect. (Outcrop of metamorphosed Mathinna Beds - creek flows). 3907 ±100m

SS08 - LUTWYCHE (distal) - same creek as SS07 just above Wolfram Creek Road (Mathinna Bed outcrop - good catchment - flows). 3908 100 ±50m

SS09 - LOILA TIER - just below Loila Tier Prospect (outcropping Mathinna Beds - creek flows - moderate catchment). 3909 ±100m

SS10 - LOILA TIER (distal) - approximately 1½km downstream from SS09 (flowing - Mathinna Beds outcrop). 3910 ±100m

SS11 - DUNN's PROSPECT - 100m downstream from Dunn's Adit (outcrops of Mathinna Beds). 3911 ±100m

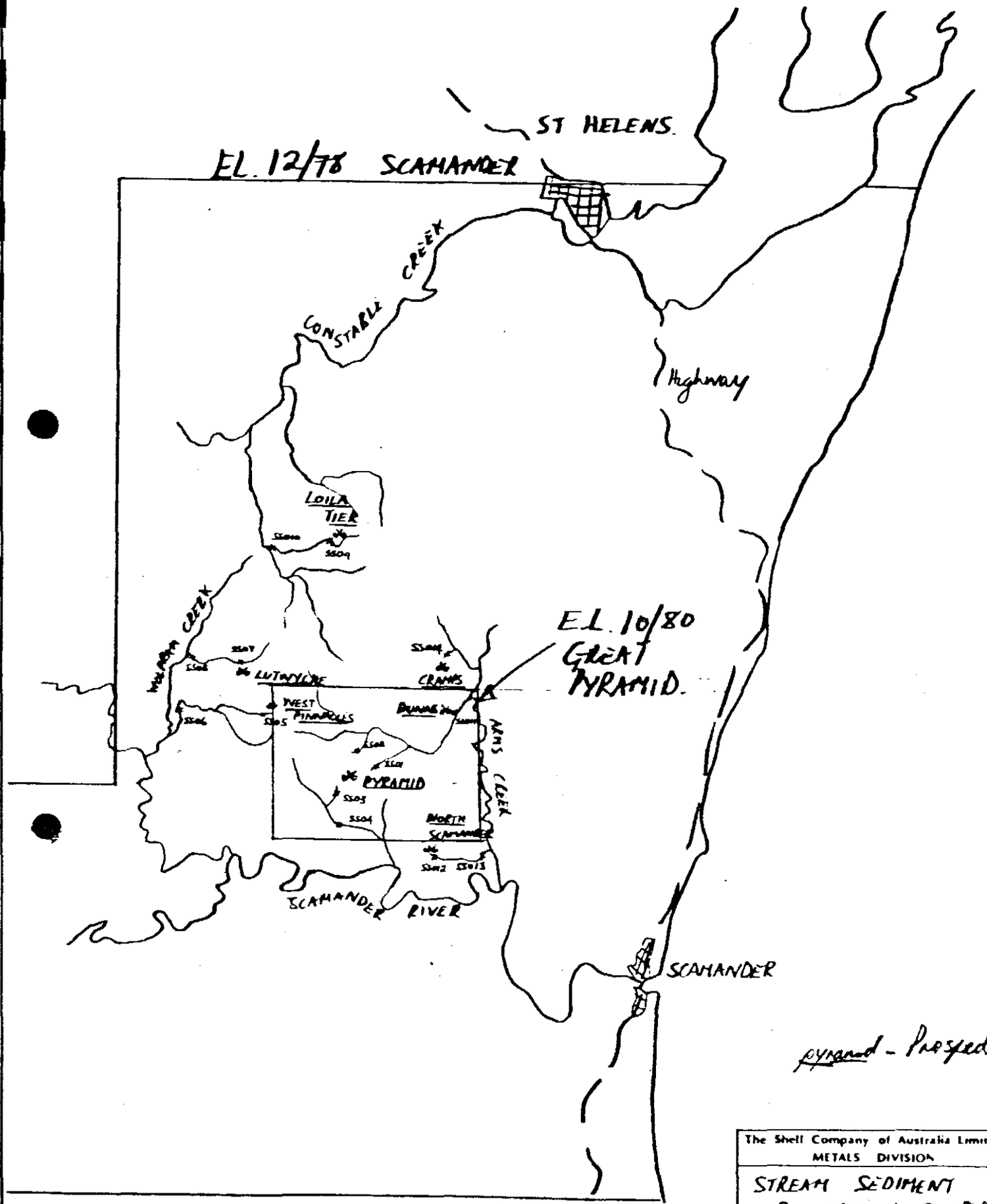
SS12 - NORTH SCAMANDER (distal) - creek just above the Arm River confluence, 1km downstream from North Scamander Adit. (No flow). 3912 ±100m

SS13 - NORTH SCAMANDER - 300m below the North Scamander Adit. (no flow - 100% Mathinna Bed float - good catchment). 3913 ±100m

SS14 - CRAMPS - stream 200m below Cramps Prospect taken 25m above the Eastern Creek Road. (No flow - 100% Mathinna Beds float). 3914 100 ±50m

DATA BASE NOS 3901 - 3914

MAP SHEETS BRILLIANT, SCAMANDER (BEAUMARIS)



The Shell Company of Australia Limited
METALS DIVISION

STREAM SEDIMENT ORIENTATION SAMPLES
SCAMANDER

Scale 1:100,000

FIG No. | REPORT No.
ENCL. No. | DRG. No.
DATE 3/6/83 | AUTHOR

SUMMARY OF STREAM SEDIMENT RESULTS

ORIENTATION SURVEY

Size Fraction

	A	B	C	D	E	F
	-5 rest	-10 rest	-10+20#	-20+40#	-40+80#	-80#
ELEMENT						
Sn ✓				‖ ←→	‖	
WO_3				‖ ←→	‖	
Mo ✓	←→					
Bi ✓	←→					
Cu ✓				‖ ←→	‖	
Pb ✓				‖ ←→	‖	
Zn ✓				‖ ←→	‖	
Ag ✓			‖ ←→	‖		
As ✓	‖ ←→	‖				
Fe ✓	‖ ←→	‖				
Mn ✓				‖ ←→	‖	

Finer size fraction suitable for the following — ‖ Sn, WO_3, Cu, Pb, Zn, Mn + Ag

(-20# + rest)

AARQUE A4 1mm.

ELEMENT Sn (in ppm) 495034

Samples	A -5 + rest	B -10 + rest	C -10 + 20#	D -20 + 40#	E -40 + 80#	F -80#	Σ
1	160	350	130	340	[illegible]	460	4
2	350	410	250	540	[illegible]	370	5
3	160	250	170	210	290	[illegible]	2
4	800	1650	1600	[illegible]	750	200	11
5	330	670	[illegible]	750	320	230	4
6	1600	2000	1050	[illegible]	2350	540	2
7	250	1400	850	[illegible]	370	36	7
8	22	22	24	40	[illegible]	60	
9	[illegible]	100	110	[illegible]?	120	48	
10	18	38	24	60	[illegible]	55	
11	60	60	70	[illegible]	55	50	
12	90	135	95	150	[illegible]	[illegible]	
13	[illegible]	510	520	660	660	450	
14	28	28	[illegible]	24	28	28	

Sn occurs dominantly in the -20+40# and -40+80# fraction

(NOTE Sum of -20+40#, -40+80# & -80# fractions is higher than coarser fractions in 9 out of 14 samples

The summation is not higher than coarser fractions in regions close to Sn prospects

AARQUE A4 1mm

ELEMENT Mo (in ppm) 495035

SAMPLE	A -5+rest	B -10+rest	C -10+20#	D -20+40#	E -40+80#	F -80#
1	<4	<4	<4	<4	<4	4
2	4	4	<4	<4	4	<4
3	<4	<4	4	<4	4	4
4	<4	<4	<4	4	4	4
5	<4	<4	4	<4	4	4
6	<4	<4	<4	<4	<4	[illegible]
7	4	4	4	6	6	[illegible]
8	<4	[illegible]	4	4	4	[illegible]
9	<4	4	<4	4	4	[illegible]
10	<4	<4	<4	<4	<4	<4
11	4	<4	<4	<4	4	4
12	<4	[illegible]	4	4	[illegible]	4
13	<4	4	<4	4	4	<4
14	<4	<4	<4	4	[illegible]	4

Mo tends to collect in finer fraction (Moly easily broken down)

Values only 2x detection –

(No worth assaying for on a regional scale really.)

AARQUE A4 1mm

ELEMENT Bi (in ppm) 495036

SAMPLE	A -5 + rest	B 10 + rest	C -10 + 20#	D -20 + 40#	E -40 + 80#	F -80#
1	4	<4	<4	[illegible]	<4	<4
2	<4	[illegible]	<4	4	[illegible]	4
3	<4	[illegible]	<4	4	<4	<4
4	4	4	4	<4	<4	<4
5	4	4	4	<4	4	<4
6	4	<4	<4	[illegible]	<4	<4
7	10	[illegible]	10	12	4	14
8	8	[illegible]	8	10	6	10
9	8	8	4	4	[illegible]	10
10	<4	[illegible]	[illegible]	[illegible]	4	4
11	[illegible]	4	<4	<4	<4	4
12	[illegible]	<4	4	4	4	<4
13	10	8	[illegible]	10	4	<4
14	<4	<4	<4	<4	4	<4

Bi has a spasmodic distribution and is generally low (up to 4x Background).

(hardly worth assaying for on a regional scale – can be considered an accessory to WO_3, Mo veins)

AARQUE A1 1

ELEMENT Cu. (in ppm) 495037

SAMPLE	A -5+rest	B -10+rest	C -10+20#	D -20+40#	E -40+80#	F -80#
1	[illegible]	38	38	[illegible]	40	38
2	44	44	40	50	[illegible]	[illegible]
3	55	70	65	[illegible]	[illegible]	[illegible]
4	20	18	[illegible]	20	20	24
5	30	34	40	40	48	[illegible]
6	[illegible]	32	34	32	36	38
7	24	26	26	26	34	[illegible]
8	24	24	30	26	26	[illegible]
9	26	26	30	30	40	[illegible]
10	20	18	22	18	22	[illegible]
11	115	110	[illegible]	120	80	60
12	50	65	60	70	[illegible]	[illegible]
13	120	140	120	140	[illegible]	120
14	24	26	26	[illegible]	28	22

Cu in finer fraction -20# +rest.

(Note - Copper core falls off with distance from prospects but v. gradually - no close sampling required to detect Cu prospects)

AAROUE A4 1mm

ELEMENT Pb (in ppm)

495038

SAMPLES	A -50 + rest	B -10 + rest	C -10 + 20#	D -20 + 40#	E -40 + 80#	F -80#
1.	90	95	80	95	120	[illegible]
2.	100	135	130	[illegible]	[illegible]	150
3.	120	180	170	[illegible]	210	195
4.	[illegible]	46	44	44	36	34
5.	110	130	120	140	160	[illegible]
6.	34	40	38	38	[illegible]	[illegible]
7.	12	12	12	12	14	[illegible]
8.	16	12	8	12	12	[illegible]
9.	10	10	12	10	12	[illegible]
10.	[illegible]	8	10	8	10	10
11.	46	70	60	50	30	24
12.	300	360	340	[illegible]	350	360
13.	750	890	760	[illegible]	[illegible]	940
14.	50	50	50	50	[illegible]	48

Pb dominantly in the fine (-20# + rest) fraction.

(NOTE — Pb tails off more markedly than Co but much less so than WO_3)

AARQUE A4 1mm

ELEMENT Zn (in ppm)

SAMPLES	A -5 + rest	B -10 + rest	C -10 + 20#	D -20 + 40#	E -40 + 80#	F -80#
1.	[illegible]	100	105	95	60	75
2.	280	320	300	[illegible]	80	[illegible]
3.	150	210	195	240	[illegible]	200
4.	210	230	230	210	220	[illegible]
5.	95	100	100	110	110	[illegible]
6.	90	95	95	[illegible]	90	90
7.	50	60	50	50	60	[illegible]
8.	50	50	50	50	40	[illegible]
9.	46	55	46	48	60	[illegible]
10.	46	48	50	[illegible]	44	50
11.	42	40	48	[illegible]	30	26
12.	260	320	290	[illegible]	340	370
13.	330	[illegible]	360	60	350	250
14.	60	65	60	[illegible]	55	42

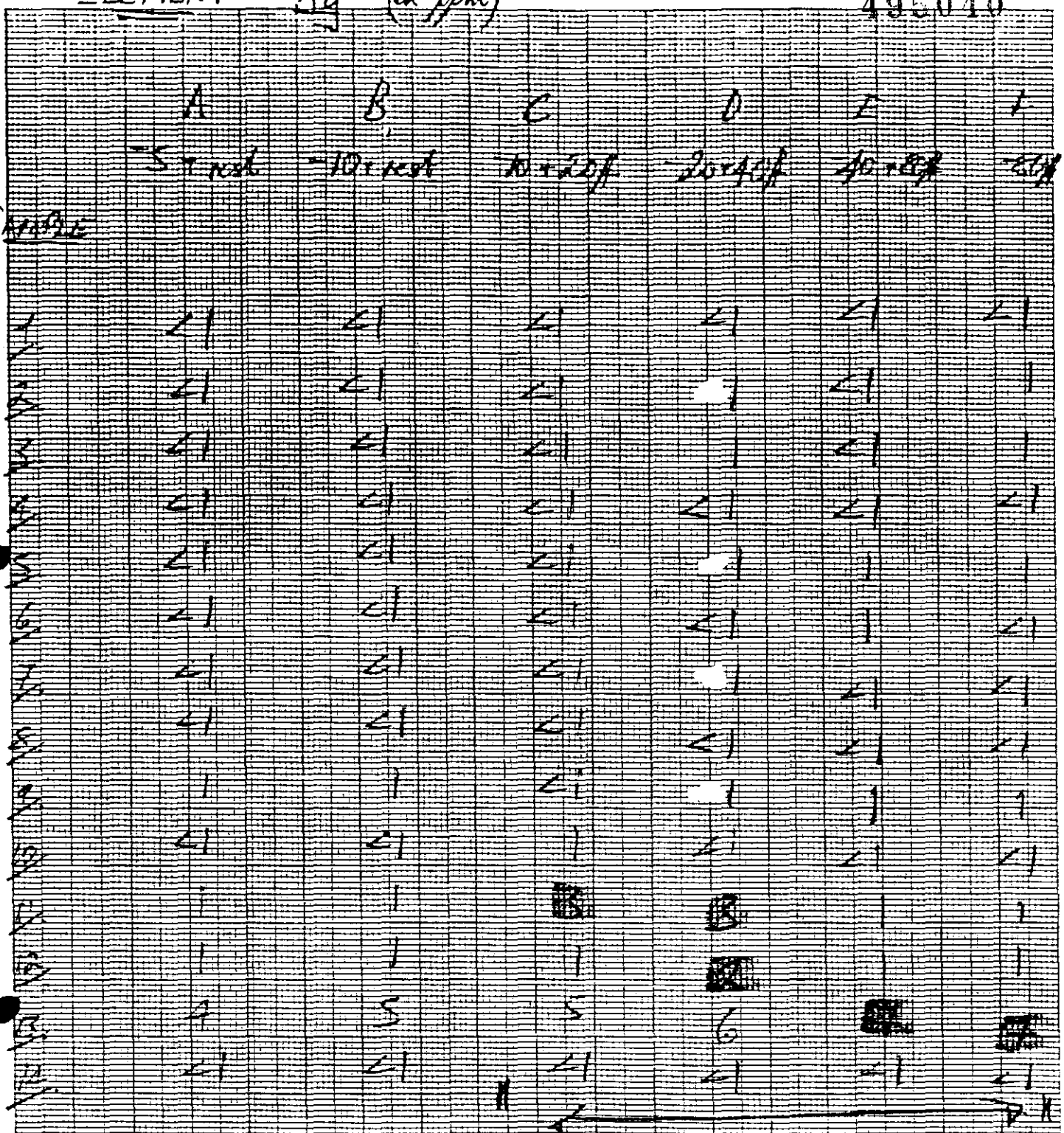
Zn dominantly in finer fraction (-20# + rest)

(NOTE - Zn tails off slowly away from prospects - mobile tile (w.)

AARQUE A4 1mm.

ELEMENT Ag (in ppm) 495040

SAMPLE	A -5+rest	B -10+rest	C -10+20#	D -20+40#	E -40+80#	F -80#
1	<1	<1	<1	<1	<1	<1
2	<1	<1	<1	[illegible]	<1	1
3	<1	<1	<1	1	<1	1
4	<1	<1	<1	<1	<1	<1
5	<1	<1	<1	[illegible]	1	1
6	<1	<1	<1	<1	1	<1
7	<1	<1	<1	[illegible]	<1	<1
8	<1	<1	<1	<1	<1	<1
9	1	1	<1	[illegible]	1	1
10	<1	<1	1	<1	<1	<1
11	1	1	[illegible]	[illegible]	1	1
12	1	1	1	[illegible]	1	1
13	4	5	5	6	[illegible]	[illegible]
14	<1	<1	<1	<1	<1	<1



Ag collects dominantly in the finer fraction upto 7x back ground / detection limit.

(NOTE Tails of down stream of N. Scamander prospect)

AARQUE A4 1mm.

ELEMENT As (in ppm) 495041

SAMPLE	A -5 inst	B -10 inst	C 10+20 ft	D 20 ft+40 ft	E -40+80 ft	F -80 ft
1	80	80	90	90	75	55
2	80	80	70	70	60	60
3	155	145	155	140	140	110
4	38	34	38	24	28	34
5	75	80	80	85	85	75
6	65	80	80	50	70	75
7	80	50	75	38	60	90
8	48	46	50	42	36	55
9	65	50	70	80	50	85
10	42	38	36	38	38	36
11	990	920	1100	1150	510	290
12	22	30	26	28	18	22
13	170	120	110	105	80	50
14	30	30	30	26	20	14

As dominantly in the coarser size fraction

(no real pattern)

AARQUE A4 1mm.

ELEMENT Fe (% assay)

495042

SAMPLE	A	B	C	D	E	F
	-5 + rest	-10 + rest	-10 + 20#	-20 + 40#	-40 + 80#	-80#
1	2.9	2.35	2.7	2.4	1.9	1.4
2	2.15	2.20	2.45	2.1	1.75	1.6
3	2.4	2.15	2.5	2.1	1.8	1.5
4	2.7	2.30	2.5	2.05	1.75	1.8
5	2.2	2.10	2.15	2.0	1.7	1.9
6	3.15	3.10	3.2	3.1	2.7	2.4
7	2.7	2.35	2.5	2.25	2.0	2.5
8	3.15	2.85	3.1	2.65	2.1	2.6
9	2.5	2.40	2.4	2.35	2.2	2.4
10	2.55	2.25	2.5	2.2	2.0	2.0
11	2.15	1.95	2.4	2.05	1.2	1.05
12	2.65	2.70	2.85	2.7	2.2	2.0
13	8.0	7.55	8.7	7.35	5.3	3.9
14	1.5	1.35	1.45	1.2	1.1	0.85

Fe is confined to the bulk and coarse sed. fractions and doesn't appear to control the distribution of Cu/Pb/Zn.

(Not worth assaying for)

AAROUE A4 1mm

ELEMENT Mn (ppm) 495043

Sample	A -5 + rest	B -10 + rest	C -10+20#	D -20+40#	E -40+80#	F -80#
1.	390	420	370	440	460	410
2.	910	1200	1200	1300	1300	1200
3.	450	620	620	[illegible]	[illegible]	600
4.	1650	1600	1600	1500	1600	2100
5.	210	250	240	280	360	360
6.	150	810	680	750	650	550
7.	650	750	660	790	1150	1900
8.	490	440	580	530	520	900
9.	350	390	340	390	480	560
10.	240	270	270	290	250	260
11.	80	85	90	110	90	90
12.	470	590	550	630	580	620
13.	110	140	135	160	150	120
14.	20	120	120	140	160	125

Mn concentrated in the finer fractions.

(Probably not worth assaying for.)

AARQUE A4 1mm

APPENDIX 2

Geological Notes on the

West Pinnacles, East Pinnacles & Cramps Prospects

EAST PINNACLES PROSPECT

1.0 General Description As py minor Py

a) Style of Mineralization

Silicified mg sandstone with associated arsenopyrite and pyrite, quartz/chlorite in fractures.

b) Host Rocks

Mathinna Bed sediments - intercalated sandstones, silicified and fractures with cleaved shales and siltstones - gossanous staining common (generally in trenches)

c) Geography/Location

Situated on the southern peak of the Pinnacle Ridge - within the PINNACLES GRID (close to line 900W 100S). Close to top of the peak - 250m RL. OD (peak 3200D).

d) Old Workings

Short adit dug on bearing 260° - approximately 6-8m deep. Two trenches 15m up hill - see diagram.

2.0 Host Rocks

Mathinna Beds

Lithology - Intercalated silicified medium to fine grained sandstone units (≏40cm thick) with stt and cleaved shales. Generally mixed rocks in the whole area.
Adit 50:50 sandstone//sh/stt
Trench 1 - silicified mg sandstones
Trench 2 - silicified fg sandstone/stt

Bedding - Beds strike 296° 81° NE dip - slight variation in dip direction (i.e. strike).

Cleavage - in rocks close by cleavage is running 131° 82° SW



antiform to West

- also measured at c) 304° 76°N with bedding at 310° 77° N on line 900W 100S



bedding //to cleavage

Fractures/faults/veins - Silicified sandstones fractured 240° 77° NW 40 - 50 or 215° 68° NW minor fractures lined with gossaneous material.

Irregular smokey and amorphous quartz veins deformational features.

Fractures also contain quartz and chlorite fills chlorite impregnates surrounding mg and fg sandstones.

Metamorphism - Metasomatic silicification of the rocks

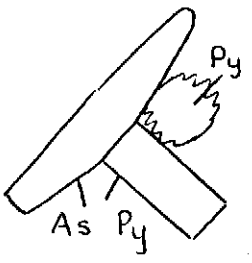
Alteration - Silicification of sandstones. Gossaneous staining on fractures, bedding and cleavage features - minor brecciation of shales forming voids (euhedral qtz fills + Fe fills).
Many of the sandstones contain chlorite impregnation - greenish colouration from the adit itself.

3.0 Mineralization

a) Gross Setting - Difficult to discern from the outcrop - mineralization probably fracture or fault-related. Orientation unknown.

b) Dimensions - Not clear - width or length exceeds 15m in Trenches 1 and 2 - arsenopyrite/pyrite silicified rock.

c) Mineralogy - Sulphide minerals include euhedral arsenopyrite laths upto 1.5cm long (blade-like growths) or may occur as dense clusters. Upto 40% arsenopyrite in some rocks. Pyrite cubes + irregular patches occur related to arsenopyrite lathe (i.e. later).



Interstitial
Py 2nd after As Py

Sulphides embedded in silicified material - looks to be a silicified mg/fg sandstone.

Identified outcrops of As, Py + Py restricted to trenches 1 and 2.

Minor Py and aspy along fractures in the Adit dump.

Fractures in adit contain chl + qtz and minor gossaneous fill (f. trend 056° 81°S) (Difficult to see why adit dug). Adit was not inspected due to insect swarm.

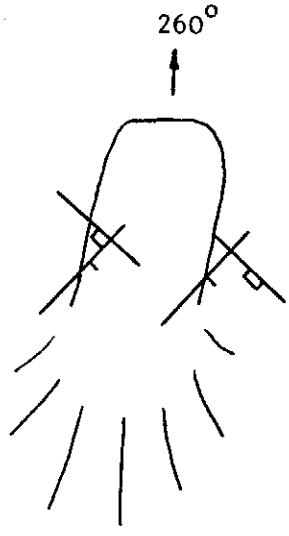
Minor muscovite recognized in fractures.

d) General

The East Pinnacles adit lies within the Pinnacles Grid. Soil values indicate low order values maximum of 80 ppm Sn in the area. 900W 100S 920 ppm As and 470 ppm Zn + minor associated Pb at 900W 150S at 300 ppm.

Low order Sn and elevated Zn/Pb and As close by (however Pb/Zn/As values isolated highs).

Quick recce around the workings - no sign of sulphide in the rocks (apart from the usual gossaneous staining) - rock sequence mixed sst + lots of cleaved shales. Trend of mineralization not discernable.

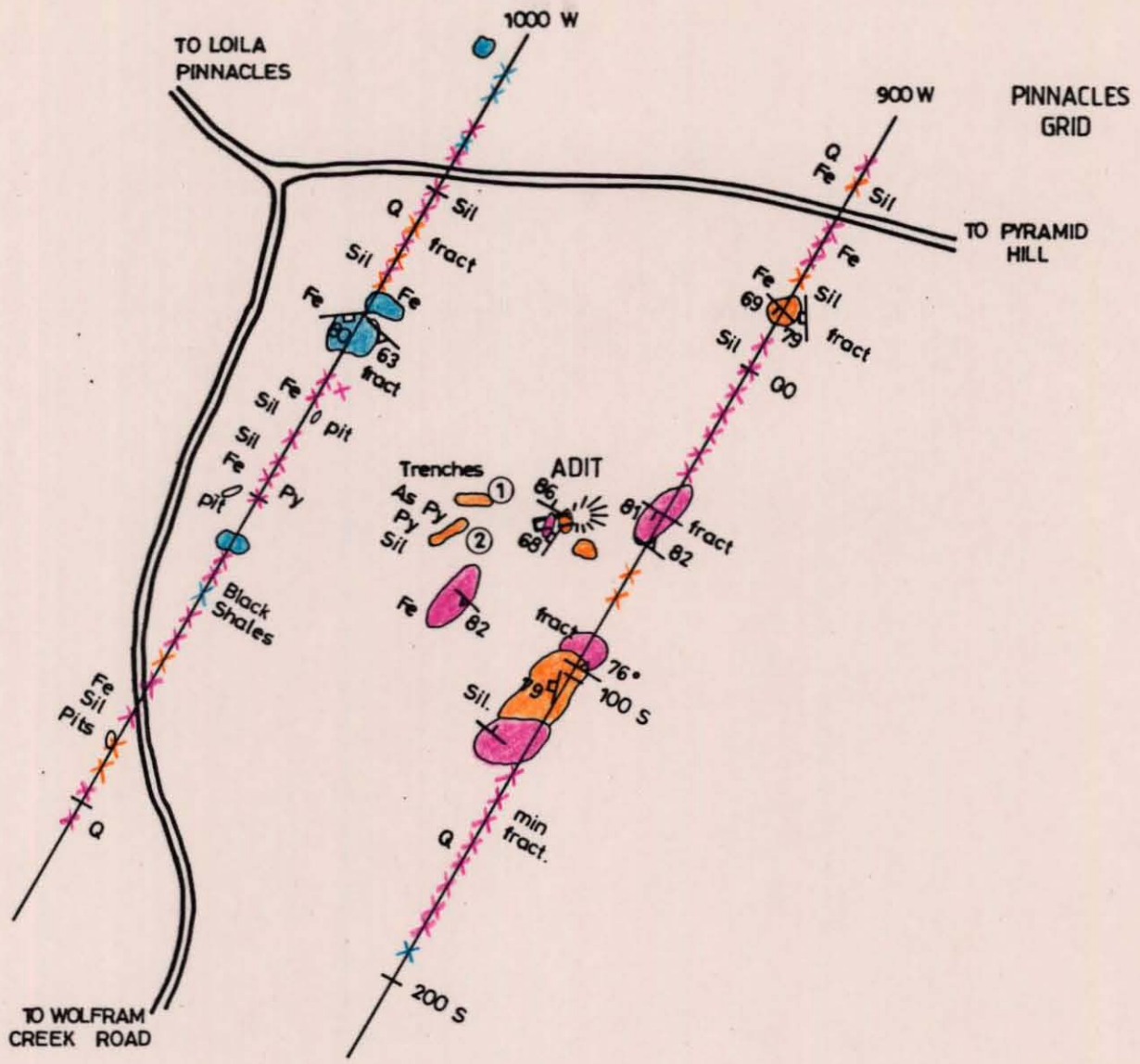


Samples

Adit 10035 - 10038

Trench 2 10034, 10039, 10040

495048



LEGEND

80° — BEDDING

82° — CLEAVAGE

40 — FRACTURE

M.N.

0 Metres 50

5 cm

The Shell Company of Australia Limited
METALS DIVISION

E.L. 12/78 SCAMANDER
EAST PINNACLES PROSPECT

SCALE 1:2000	DATE 10-8-83
AUTHOR P.A.R	DRAWN J.L.L.
OFFICE D'PORT	REP.No.
DRG.No. D/LH02/513	FIG.No.

WEST PINNACLES PROSPECT

1.0 General Description — Sn minor Cu

a) Style of Mineralization

Cassiterite in euhedral quartz + Fe oxide fracture fills associated with silicified/fractures mg/fg sandstones. Minor chalcopyrite and muscovite.

b) Host Rocks

Mathinna Bed Sediments - intercalated sandstones, cleaved shales and siltstones. Cassiterite-bearing veins appear restricted to sandstone units in hand specimens.

c) Geography/Location

Located on the south-side of the Pinnacles Ridge approx. 150m SE of the Loila Pinnacle Peak - within the PINNACLES GRID (on Line 200N 1600W, RL 315 OD - Loila Tier Peak 365 OD.

d) Old workings

54m adit dug on bearing 360° and bends to 040° at completion. Numerous shallow pits on the surround hill.

2.0 Host Rocks

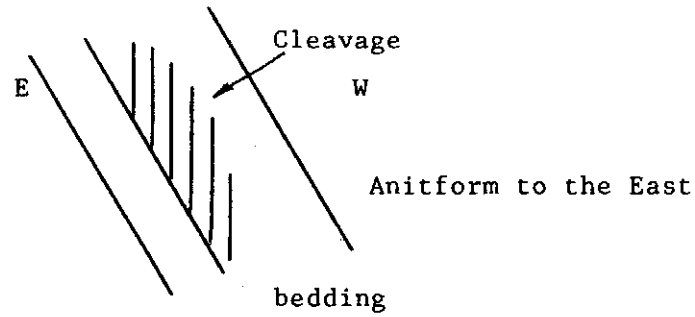
Mathinna Beds

Lithology - Intercalated silicified fractured mg to fg sandstones (units of variable thickness upto 1m + across) with cleaved siltstones and shales (attached diagram) Rocks generally mixed on the finer grained side of stt/fg sst.

Adit - lithologies summarized in attached plan.

Bedding - Beds generally strike NW and dip steeply to the NE and SW - no fold closures seen in the adit walls - change of dip attributed to overturning of the strata due to flexturing of steeply dipping strata. Slight variation in bedding direction.

Cleavage - Found in siltstone and shale units generally parallel to bedding but may indicate antiform to the East.



Fractures/faults/veins - Silicified sandstones fractured with a trend from 203° to 263° all dipping steeply NW - contain gossaneous material and also euhedral qtz/cassiterite/chalcopyrite/muscovite and Fe oxides.

Irregular smokey/amorphous quartz veins common in sandstone units.

Fractures flat-lying - perhaps joints? related to flextural slip-style folding?

Metamorphism - Metasomatic silicification of rocks - some spotted shales close to adit (attached location plan).

Alteration - Intense silicification of mg and fg sandstones - silicification is associated in places with relic pyrite cube structures (pyrite removed by oxidation).

Gossanous staining ubiquitous plus shales Fe impregnated (purple colouration).

Kaolinitic and clay mineral gauge in fractures (especially towards the end of the adit).

3.0 Mineralization

a) Gross Setting

Cassiterite associated with Pyramid-style fractures which trend NE (203° to 263° strike) and dip steeply NW - similar trend to the Pyramid-style fracture sets but more variable in their strike orientation here (probably caused by rapid lithological variation - fractures straighter and more continuous in large sandstone units).

Fractures attain 40-60 fractures/metre density (-small concentration when compared to Pyramid Hill).

Rocks generally most fractured and widest - more filling - qtz Fe oxides + cass and cho at between 13.1m - 22.3m and 24.2m and 27.8m in the West Pinnacles adit.

b) Dimensions

The West Pinnacles Adit occurs on the northern margin of the Zone A Sn in soil anomaly on the Pinnacles Grid. In this area Zone A anomaly and Zone B anomaly are coincident (1600W 200N soil sample yields 180 ppm Sn). It's clear from mapping on the Pinnacles grid that a large area contains cassiterite in fractures (Zone B) and cassiterite in tourmaline/qtz veins (Zone A). The adit tests one part of this area - further potential is evident particularly to the SW of the adit itself. 11 reverse circulation drill holes will test this zone in September, 1983.

Zone A 1000m x 600m area Sn in soil anomalies

Zone B 1200m x 300-400m area

Cassiterite mineralization in the adit itself is localized (apparently) to mg and fg silicified sandstone units. No tin was found in the adit - only on samples from the dump.

Clearly the Sn distribution is erratic and low grade.

c) Mineralogy

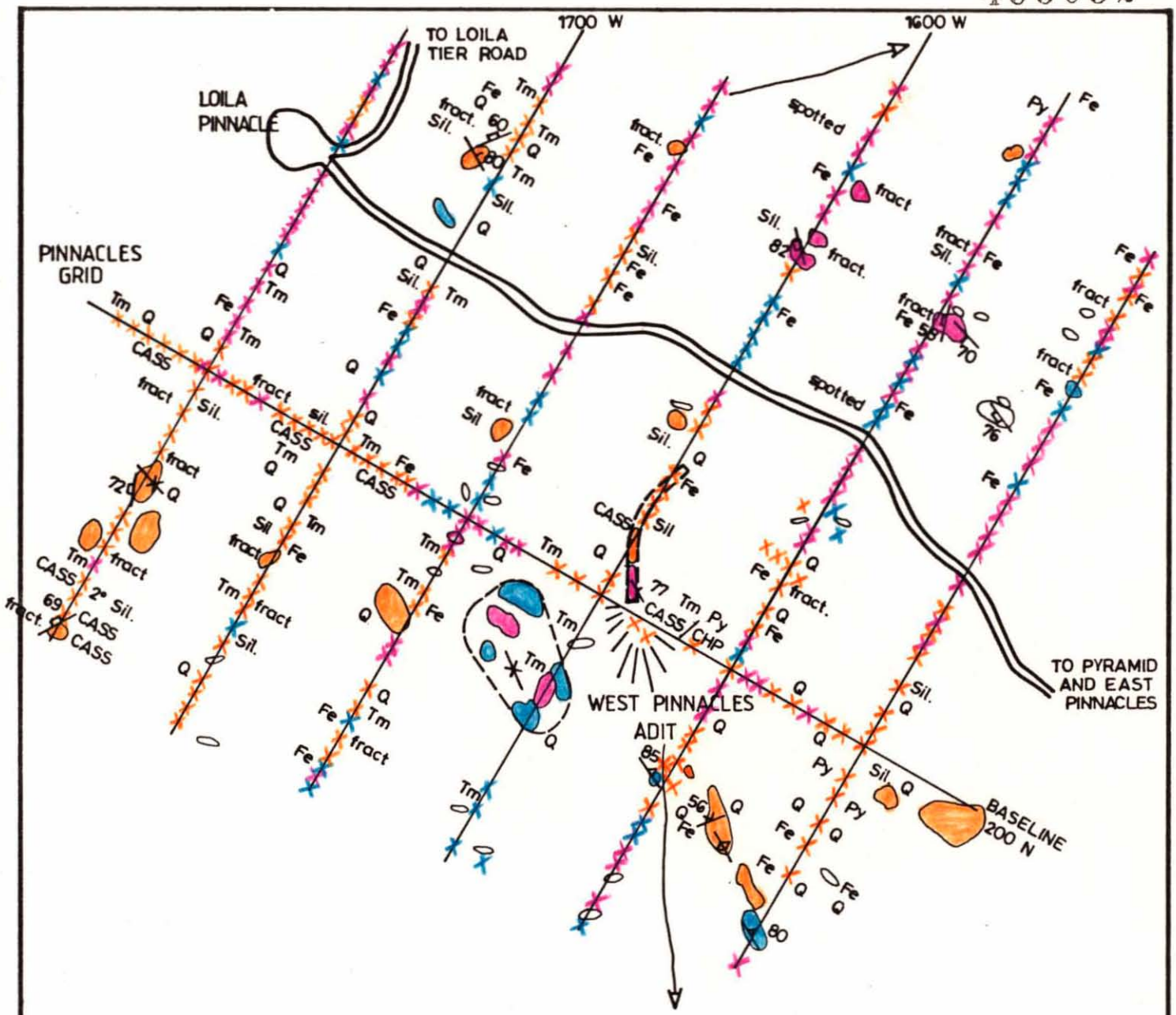
Cassiterite - pale brown/pink may also be greenish - euhedral upto 1cm across in one sample - generally upto 5mm across pretty rare too. (Groves, 1972) reports no record of tin production from both W and E Pinnacles adits. Trace chalcopyrite observed with Sn in fracture fills.

Pyrite cube structures in silicified mg/fg sandstones.

Gauge minerals, euhedral quartz fills fractures. Maximum fracture/vein width 3-5cm generally thinner. Qtz fills voids + cassiterite void filling (and pyrite occassionally) Fe oxides later fractures filling and pervasive rock alteration - related to recent oxidation of sulphides.

Muscovite tourmaline (fine grained amorphous mass) seen as fracture/vein fill in this area.

Rock samples 10041 - 10043.



LEGEND

80° — BEDDING

82° — CLEAVAGE

40 — FRACTURE

VERTICAL VEINS

VERTICAL CLEAVAGE

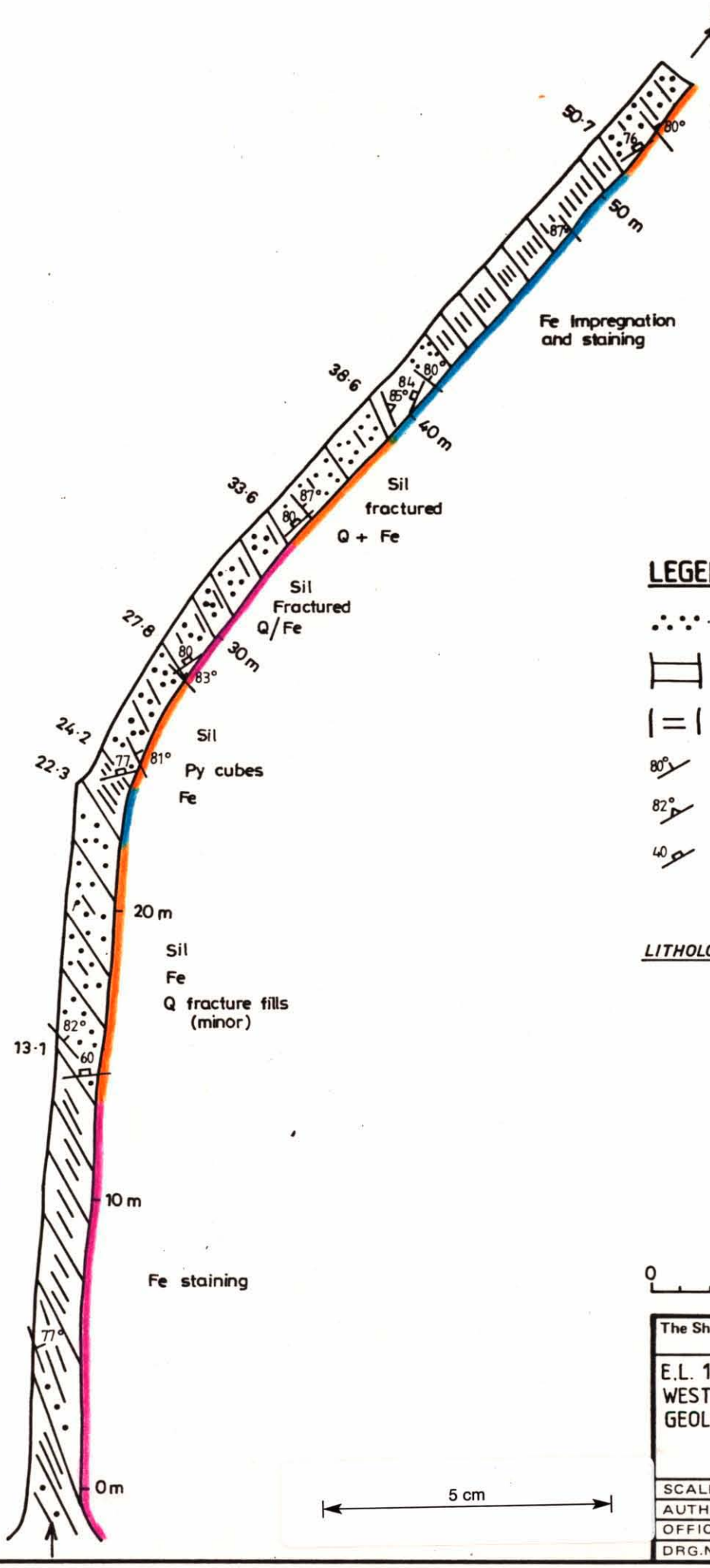
M.N.

0 Metres 50

5 cm

The Shell Company of Australia Limited METALS DIVISION	
E.L. 12/78 SCAMANDER WEST PINNACLES PROSPECT	
SCALE 1:2000	DATE 10-8-83
AUTHOR P.A.R.	DRAWN J.L.L.
OFFICE D'PORT	REP.No.
DRG.No. D/LH02/512	FIG.No.

495053



LEGEND

- SANDSTONE
- SILTSTONE
- SHALE
- BEDDING
- CLEAVAGE
- FRACTURE

LITHOLOGY DIAGRAMATIC

M.N.

0 Metres 10

The Shell Company of Australia Limited
METALS DIVISION

E.L. 12/78 SCAMANDER
WEST PINNACLES ADIT
GEOLOGY

SCALE 1:200	DATE 10-8-83
AUTHOR P.A.R.	DRAWN J.L.L
OFFICE D'PORT	REP.No.
DRG.No. D/LHO2/514	FIG.No.

CRAMPS PROSPECT

1.0 GENERAL DESCRIPTION As Py, Py

a) Style of Mineralization

Fault-related Fe oxides, silicification with minor scorodite staining at surface. The similarity of rocks from this prospect with those from Dunns Prospect suggest the occurrence of Cu/Pb/Zn sulphides at depth.

b) Host Rocks

Mathinna Bed sediments - generally a fine grained sequence of cleaved shaels and siltstones with minor sandstone units - the latter are silicified in the shaft area.

c) Geography/Location

Located west of Cramps Road/Arm Creek and north of the Orieco Road in plantation of radiolarian pines. Outcrop generally poor - minor outcrop in the creeks situated within the Cramps Grid (BHP). Shaft sunk on fault zone in low hill RL 75m.

d) Old Workings

Two shafts dug adjacent to each other - one of 30m depth (Groves, 1972) the adjacent shaft 5m to the east (unknown depth).

2.0 HOST ROCKS

Mathinna Beds

Lithology - Intercalated cleaved dark grey shales and siltstones - minor intercalated sandstone units (20cm thick). Mathinna Beds in the surrounding area generally graded ssts to stt/shales. Beds generally dip west and young to the west. Minor silicified sandstones on the shaft dump.

Bedding - Beds generally strike 120° - 150° (SE) dipping to the SW. Graded bedding and load cast features suggest younging to the west. Beds the correct way up.

Cleavage - Variable - related to bedding and SE trending folding. May be parallel to bedding also.

Antiform to the east suggested (NW of Cramps prospect).

Fractures/veins/faults - Minor fracturing in the surrounding sediments (273° trend minor). Sandstones contain amorphous and smokey quartz veins. Veins adjacent to fault-zone in Arm Creek exposure - trend 024° 83°E - 5mm wide max. die out 2-3m from fault zone.
Fe-oxides concentrated in faults trending NNE.

Metamorphism - Minor spotting observed in one outcrop. Gossanous staining - localized.

Alteration - Silicification of sst in area of the fault-zone + qtz veining. Fe-oxide staining and gossanous fills/coatings.
Alteration confined to fault zones.

3.0 MINERALIZATION

Gross Setting/Dimensions

Confined to a NNE trending fault zone (-bearing of 020°) strike length of 700m plus, width 10m - in Arm Creek outcrop width if approx. 3m.

Mineralogy

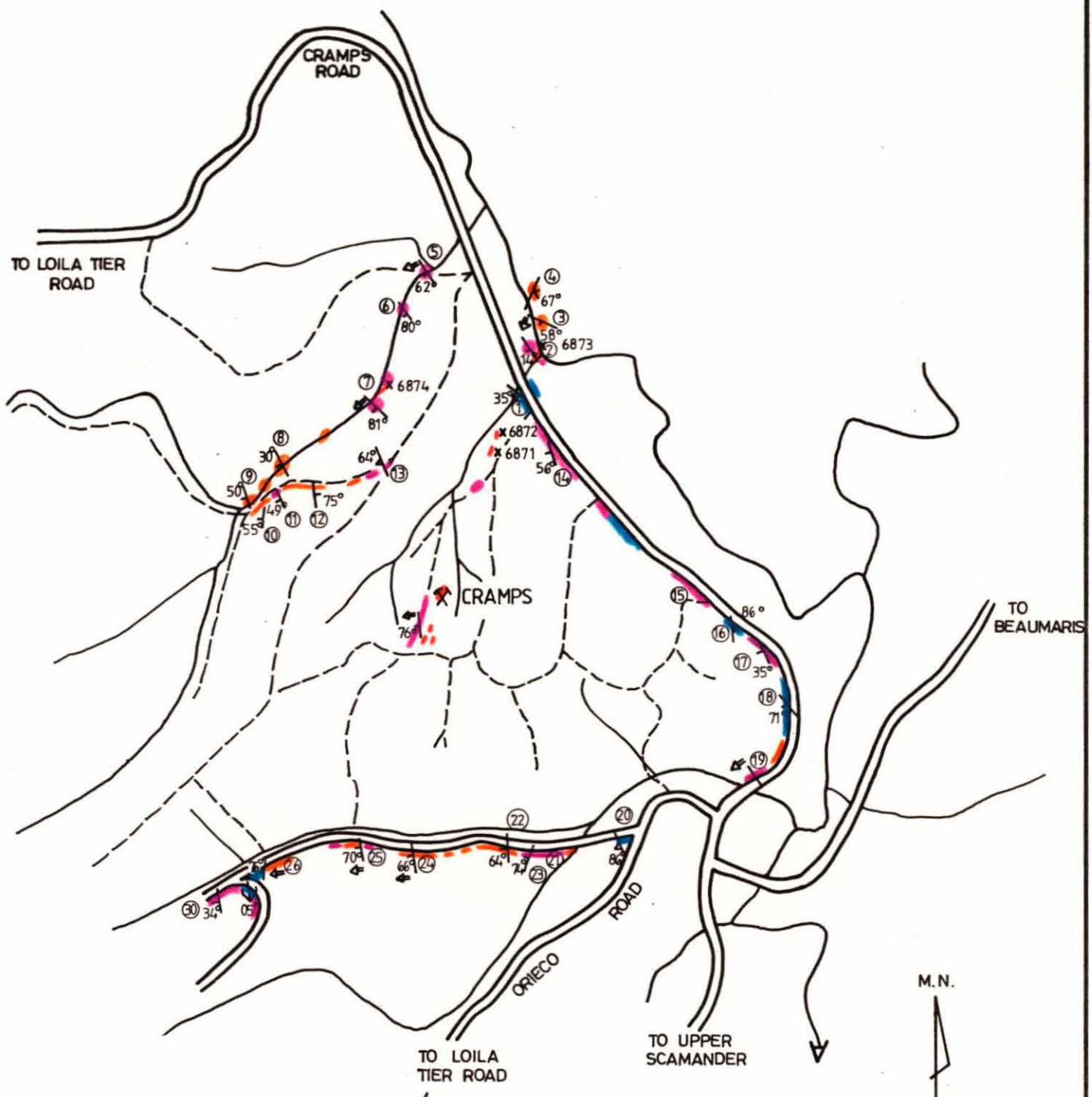
Rocks in fault zone are silicified and contain Fe gossanous fills, encrustations. At the Cramps shaft no sulphides evident - only minor scorodite staining. Essentially a supergene enrichment zone where metals could have been scavenged by Fe oxides.

Muscovite/qtz vein fills/fracture-fills - quartz veining is common.

Fe oxides generally dominated by haematite in fault-zone - also limonite/geothite.

Arm Creek exposure - minor pyrite in silicified fg sandstones - from within the zone of disturbance - faulting restricted to a few shear planes with Fe oxide staining.

495056



The Shell Company of Australia Limited
METALS DIVISION

E.L. 12/78 SCAMANDER
CRAMPS PROSPECT
AND ENVIRONS

SCALE 1:10000	DATE 11-8-83
AUTHOR P.A.R.	DRAWN J.L.L.
OFFICE D'PORT	REP.No.
DRG.No. D/LH02/511	FIG.No.

APPENDIX 3

Rock Property Tests - Scamander

Date 1/8/83

PETROPHYSICAL DATA RECORD SHEET Shell Lot 7/83

Reference P. Ruston 14/6/87

Sample Information			Textural Properties				Magnetic Properties					Electrical Properties		
No.	Depth		DBA OBD gms/cc	SGG gms/cc	P_E% % porosity	P_T%	Vol. Susc. cgs 10^{-6}	N R M Vector Magnitude	Azimuth	Dip	Clean	Resistivity ohm m (freq.) 30 Hz (Rw/temp) (20°C)	I.P. Effect	Comments:
561			2.61		0.99		v. low [illegible]					1,161 ohm	~0	[illegible]
562			2.63		0.26		"					2,184	~0	
563			2.64		0.63		"					3,183	~0	
564			2.52		2.10	high porosity	"					1,508	~0	
565			2.43		10.17	! very high	"					583	~0	
566			2.49		7.58	! "	"					192	~0	
567			2.59		4.20	! "	"					2,758	~0	mineralized? but [illegible] no IP
													instrument problems (subsequently fixed) @ low frequencies so IP [illegible] used $\frac{\rho_{30} - \rho_{300}}{\rho_{300}}$	c.c. measured resistivities @ 30 Hz - 300 Hz decade interval

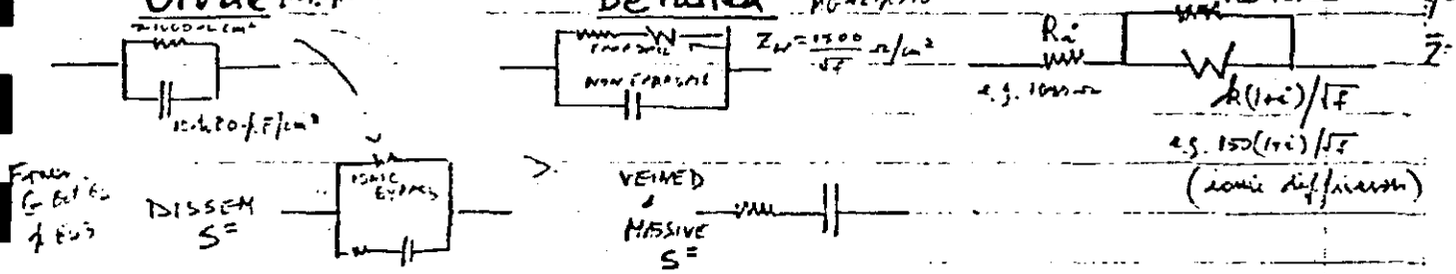
495058

(1° = 17.4 mrads)

$PFE = \frac{\rho_{DC} - \rho_{AC}}{\rho_{AC}}$: 1% PFE ≈ −5½ millirads. = 5 mv sec/V M_{331} empirical relation.
over 1 decade — Phase lag — chargeability

ANALOGS — ELECTRODE/METALLIC — MEMBRANE.

Crude R.F. p 442 — Detailed MG-2 p 378 — $\bar{Y} = G + iB$, $\bar{Z} = R + iX$



FACTORS

1) Current Density — $\bar{j}$ ↑ : ρ↓ IP↓ ∵ sat. Lumen p 95 cf Keller G Ot'Gl p 852-5
try to keep $< 10^{-7}$ A/cm² i.e. $< 10^{-3}$ A/m².

2) Temperature — T↑ — Membrane IP ↑ ∵ double layer expands.
Metallic IP ↓ ∵ diffusion ↑.

3) Rock Matrix Resistivity for given S= % — ρ↑ Φ↓ IP↑ ∵ current must go per S= ; ρ↓ Φ↑ IP↓ ∵ bypass — "hi ρ means hi IP."

4) % S= — if very massive J grain to grain IP↓

5) Water Saturation — S_w↓ to ~75% IP ↑
S_w↓ further IP ↓↓

6) Grainsize — generally smaller (fraction mm) optimum in tight rock.

7) Water Resistivity — Membrane/clay — Salinity↑ ρ_w↓ IP↓ — cation clouds (anion trap) smaller ∴ black less

Dissem S= — complex effect; variable but usually see P.E. p 211
salinity ↑ ρ_w↓ IP↓ ∵ ionic bypass

Veined S= — little effect

8) Clay Content R.F. p 449 — complex effect — few % clay is optimum

clay % ↑ to say 30% IP↓ ∵ continuous clay zone & all anions → clays trap
if clay % v. low (nothing to trap anions) IP↓.

9) Jointing — effect not clear; perhaps more interfacing of sulphides to electrolyte, but possibly more ionic bypass
usually joint porosity 0 to 2% in hard rock

495059

495060

Formula for Computing Electrical Resistivities of Jointed Rocks

from: Parkhomenko, E.I., 1967, Electrical Properties of Rocks, Plenum.

ρ_o resistivity of the rock mass along the co-ordinate axis.

* ρ_p resistivity of the individual rock blocks bounded by joints.

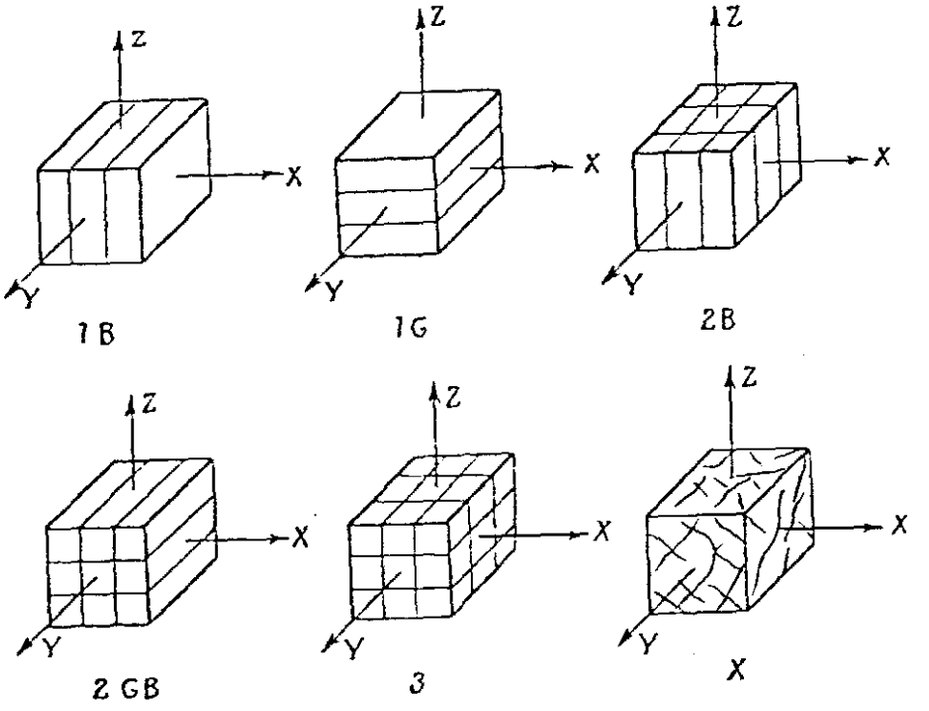
ρ_v resistivity of water filling the joints

m joint porosity

* *as determined in lab. or small scale in situ measurements*

Formulas for Computing Resistivity in Jointed Rocks

Case	Axis along which current flows	Formula for bulk resistivity	
1B 1G	X Z	$\rho_0 = \rho_p - m(\rho_p - \rho_v)$	(1)
1B 1C 2B 2GB	Z, Y X, Y Z Y	$\frac{1}{\rho_0} = \frac{m}{\rho_v} + \frac{1-m}{\rho_p}$	(2)
2B 2GB	X, Y X, Z	$\frac{1}{\rho_0} = \frac{m}{2\rho_v} + \frac{1}{\rho_p}$	(3)
3 X	X, Y, Z X, Y, Z	$\frac{1}{\rho_0} = \frac{2m}{3\rho_v} + \frac{3-2m}{\rho_p(3-m)}$	(4)



Schematic representation of various forms of fracturing in rocks.

APPENDIX 4

Regional Soil Orientation Survey

495062

SOIL ORIENTATION SURVEY

E.L. 12/78 - SCAMANDER

TASMANIA

Author: P.A. Ruxton

Date: March, 1983

SOIL ORIENTATION SURVEY

A soil orientation survey was taken over the Scamander Licence to help understand the distribution of tin and other elements in soils. 14 samples were collected using hand augers and small hoes to obtain a sample as close to bedrock as possible. Five size fractions were sieved from each sample:

A sample	- 5# + rest.
B sample	- 5# + 20#
C sample	-20# + 40#
D sample	-40# + 80#
E sample	- 80#

and each sample fraction (a total of 70 in all) was assayed by Comlabs for:

XRF 1	Sn, W, Mo, Bi, As
AAS 1	Cu, Pb, Zn
AAS 3	Ag

The locations of the samples and the results are attached.

Results: The distribution of all elements except As (which tended to concentrate in the -5# +20# size fraction) is erratic. Sn results from Pyramid Hill and Pinnacles show no preferred size fraction. The erratic nature of the results, added to the fact that there are several styles of mineralization in the Scamander Licence would suggest that a grab (-5# + rest) sample will give the most effective results. The use of a grab sample will ensure no loss of coarse or fine grained tin in sieving operations, although Sn peaks at various fractions will be diluted by lower values of the surrounding size groups. Despite this dilution effect the results show that the grab (-5# + rest) sample gives an assay result in the same "ball park" as the peak value. On inspection of the "-5# + rest" sample a lot of coarse rock fragments were observed. Sieving down to -10# + rest gives less rock fragments without the loss of individual crystals.

Conclusions & Recommendations

The distribution of all elements (except perhaps As) is erratic in the soils of the Scamander.

A grab sample will be collected (-10# + rest), with -10# rather than -5# coarse sieve used to remove rock fragments.

All samples will be collected as close to bedrock as possible with hand augers and hoes to avoid contamination by soil creep on the steep hillsides of the Scamander area.

SAMPLE LOCATIONS

1. Pyramid Hill - N. Block N300, E500 peg. 0.3m BR (Sn/Ag)
2. Pyramid Hill - N. Block N350, E450 peg. close to 2a-2b BPD 0.4m BR (Sn/Ag)
3. Pyramid Hill - S. Block N300, E400 peg. 0.2m BR (Sn/Ag)
4. West Pinnacles - directly above adit (5m from opening) 0.6m BR (Sn)
5. East Pinnacles - directly above adit (5m from entrance) 0.8m BR (Sn)
6. East Pinnacles - trench - side of pit in Hm/Lim gossanous zone + above (-0.6m)BR (Sn)
7. Lutwyche - 3m from qtz veins + WO_3 in pit. 0.2m BR (2 holes to collect enough sample) (WO_3/Mo)
8. Baden Powell - 2m west of WO_3/Mo vein Qtz ^{3}/4 way down hill/ vein. 0.5m BR (WO_3/Mo)
9. Baden Powell - on BPS 021 (BHP) (500E 600N) 0.4m BR (WO_3/Mo)
10. Dunns Prospect - directly above adit. 0.4m BR (Sn/As/Cu/Pb/Zn/Ag)
11. Paul Beahrs - above road cut on extension from adit. 0.2m BR (Sn/Cu/Pb/Zn/Ag)
12. North Scamander - 1550N 550W peg. 0.4m BR? (Sn/Pb/Zn)
13. North Scamander - 1500N 750W peg. 0.4m (pit) (Sn/Pb/Zn)
14. Pyramid Hill - S. Block N250 E350 (0.2m BR) (Sn/Ag)

(BR = Bed rock)

ELEMENT Sn

SAMPLES	A 5ft end	B 5ft + 20ft	C 20ft + 40ft	D 40ft + 80ft	E 80ft
(1) PYRAMID NB (300N, 350E)	510	510	640	670	470
(2) PYRAMID NB (350N 450E)	1700	1100	1900	2200	1850
(3) PYRAMID SB (300N 400E)	1350	1850	1700	1650	860
(4) PYRAMID SB (350N 350E)	9500	1.29%	2.0%	1.41%	4000
(4) West Pinnacles	380	280	570	300	155
(5) East Pinnacles	95	70	115	100	105
(6) East Pinnacles	105	105	95	100	110
(7) LUTWYCHE	10	18	10	10	14
(8) BADEN POWELL	26	20	26	28	18
(9) BADEN POWELL	20	20	60	65	50
(10) DUNNS	210	260	220	220	210
(11) PAUL BEAHRS	220	310	185	115	120
(12) N. SCAMANDER	85	55	75	80	90
(13) N SCAMANDER	620	600	860	780	650

ELEMENT W

SAMPLES	A Sheet	B -5# + 20#	C -20# + 40#	D -40# + 80#	E -80#
PYRAMID NB (300N 350E)	15	15	15	10	15
PYRAMID NB (350N 450E)	20	20	15	20	25
PYRAMID SB (300N 400E)	15	15	15	15	20
PYRAMID SB (350N 350E)	45	70	75	60	45
West Pinnacles	<10	10	10	15	10
East Pinnacles	15	10	10	10	10
East Pinnacles	20	25	25	15	10
LUTWYCHE	10	<10	10	10	10
BADEN POWELL	65	50	65	50	30
BADEN POWELL	35	30	45	30	20
DUNNS	<10	<10	<10	<10	10
PAUL BEAHRS	<10	<10	10	<10	<10
N. SCAMANDER	<10	10	<10	<10	<10
N. SCAMANDER	10	<10	10	15	10

ELEMENT Bi

SAMPLES	A 5# and	B -5# + 20#	C -20# + 40#	D -40# + 80#	E -80#
PYRAMID NB (300N, 350E)	16	4	8	12	6
PYRAMID NB (350N 450E)	24	26	24	24	20
PYRAMID SB (300N 400E)	<4	<4	<4	<4	4
PYRAMID SB (350N 350E)	20	24	16	16	6
West Pinnacles	<4	<4	<4	<4	<4
East Pinnacles	4	<4	<4	<4	4
East Pinnacles	8	<4	8	4	<4
LUTWYCHE	6	4	<4	<4	6
BADEN POWELL	10	36	14	12	10
BADEN POWELL	8	12	12	8	4
DUNNS	12	12	10	14	12
PAUL BEAHRS	6	<4	<4	<4	4
N. SCAMANDER	<4	<4	<4	<4	4
N. SCAMANDER	4	<4	<4	<4	4

ELEMENT Mo

SAMPLES	A -5ft + 2ft	B -5ft + 2ft	C -20ft + 40ft	D -40ft + 80ft	E -80ft
1) PYRAMID NB (300N, 350E)	<4	6	<4	4	4
2) PYRAMID NB (350N 450E)	6	4	4	8	8
3) PYRAMID SB (300N 400E)	12	6	12	12	12
4) PYRAMID SB (250N 350E)	6	4	12	8	<4
5) West Pinnacles	8	10	12	22	12
6) East Pinnacles	12	6	10	8	8
7) East Pinnacles	<4	<4	<4	<4	4
8) LUTWYCHE	8	14	18	30	12
9) BADEN POWELL	8	12	10	10	8
10) BADEN POWELL	6	10	6	10	6
11) DUNNS	<4	<4	4	<4	<4
12) PAUL BEAHRS	6	12	8	14	<4
13) N. SCAMANDER	6	4	10	6	4
14) N. SCAMANDER	4	6	6	20	6

ELEMENT As

SAMPLES	A 5# end	B -5# + 20#	C -20# + 40#	D -40# + 80#	E -80#
PYRAMID NB (300N, 350E)	190	230	210	210	185
PYRAMID NB (350N 450E)	670	810	800	730	530
PYRAMID SB (300N 400E)	44	65	44	32	28
PYRAMID SB (250N 350E)	80	230	5	8	65
West Pinnacles	30	28	28	26	28
East Pinnacles	90	115	110	85	75
East Pinnacles	3400	3500	2750	1800	1350
LUTWYCHE	20	32	22	14	10
BADEN POWELL	14	12	10	14	10
BADEN POWELL	9	12	10	7	8
DUNNS	3950	4350	3750	3550	3650
PAUL BEAHRS	10	18	7	2	7
N. SCAMANDER	12	16	16	12	7
N. SCAMANDER	<2	2	<2	<2	<2

ELEMENT W

SAMPLES	A 5ft end	B 5ft + 20ft	C 20ft + 40ft	D 40ft + 80ft	E 80ft
1) PYRAMID NB (300N, 350E)	200	160	200	240	240
2) PYRAMID NB (350N 450E)	60	60	75	70	48
3) PYRAMID SB (300N 400E)	14	16	16	14	12
4) PYRAMID SB (350N 350E)	8	14	16	14	8
4) West Pinnacles	6	6	10	10	10
5) East Pinnacles	34	30	44	36	36
6) East Pinnacles	220	240	210	160	145
7) LUTWYCHE	14	16	20	14	12
8) BADEN POWELL	32	26	34	34	36
9) BADEN POWELL	42	40	42	44	42
10) DUNNS	240	240	240	220	250
11) PAUL BEAHRS	40	60	38	28	28
12) N. SCAMANDER	12	14	14	14	8
13) N. SCAMANDER	8	6	12	12	12

ELEMENT Pb

SAMPLES	A 5# and	B -5# + 20#	C -20# + 40#	D -40# + 80#	E -80#
(1) PYRAMID NB (300N, 350E)	290	260	330	370	320
(2) PYRAMID NB (350N 450E)	85	85	100	90	80
(3) PYRAMID SB (300N 400E)	36	42	42	40	42
(4) PYRAMID SB (250N 350E)	75	85	80	75	80
(4) West Pinnacle	16	16	20	20	18
(5) East Pinnacles	70	75	80	70	70
(6) East Pinnacles	680	600	470	350	290
(7) LUTWYCHE	16	18	26	16	14
(8) BADEN POWELL	22	26	28	32	24
(9) BADEN POWELL	22	28	28	26	20
(10) DUNNS	230	230	230	250	230
(11) PAUL BEAHRS	130	190	140	90	100
(12) N. SCAMANDER	140	160	160	115	150
(13) N. SCAMANDER	24	260	320	260	195

ELEMENT Zn

SAMPLES	A 5ft + rest	B -5ft + 20ft	C -20ft + 40ft	D -40ft + 80ft	E -80ft
PYRAMID NB (300N, 350E)	130	100	125	140	140
PYRAMID NB (350N 450E)	18	16	18	20	16
PYRAMID SB (300N 400E)	8	8	8	8	8
PYRAMID SB (250N 350E)	4	6	6	6	4
West Pinnacles	24	20	26	22	26
East Pinnacles	170	100	170	140	150
East Pinnacles	260	280	250	210	210
LUTWYCHE	12	12	12	8	12
BADEN POWELL	36	32	36	40	35
BADEN POWELL	36	38	34	38	36
DUNNS	42	44	44	44	40
MUL BEAHRS	36	60	34	20	22
N. SCAMANDER	32	48	44	28	16
N. SCAMANDER	65	70	65	50	46

ELEMENT Ag

SAMPLES	A 5# end	B -5# + 20#	C -20# + 40#	D -40# + 80#	E -80#
PYRAMID NB (300N, 350E)	1	<1	1	<1	1
PYRAMID NB (350N 450E)	1	1	<1	1	1
PYRAMID SB (300N 400E)	<1	<1	<1	<1	<1
PYRAMID SB (250N 350E)	<1	<1	<1	<1	<1
West Pinnacles	<1	<1	<1	<1	<1
East Pinnacles	<1	<1	<1	<1	1
East Pinnacles	15	13	12	10	10
LUTWYCHE	<1	<1	<1	<1	<1
BADEN POWELL	<1	<1	<1	<1	<1
BADEN POWELL	<1	<1	<1	<1	<1
DUNNS	<1	4	5	6	6
PAUL BEAHRS	1	1	1	1	1
N. SCAMANDER	<1	<1	<1	1	<1
N. SCAMANDER	<1	<1	<1	1	<1

Memorandum

495074

Date 26 April, 1983

From BXR/1:RB:AJP

To BXH/Devonport - P.R.

c.c. BXH/Devonport - R.W.

SOIL ORIENTATION SURVEY FOR TIN

Peter,

Thank you for your note on the soil orientation study in NE Tasmania. Your conclusions appear justified in the basis of the analyses. Is there any information from petrology/metallurgy reports on the most frequent grain sizes of the cassiterite mineralisation at Great Pyramid? This might give you a better understanding of the distributions that you have found in the soil samples.

On the basis of the Sn values alone, the sample sites appear to fall into two types - those with similar minus 80 mesh fraction levels to other fractions, and those in which the finer fraction is relatively depleted in Sn. There may be some value in taking a minus 20 - plus 80 mesh fraction if the target includes a variety of styles of mineralisation. Do you have any weights for this various fractions to determine if the finest fraction is a significant proportion of the total sample?

You may like to consider further a orientation survey if you plan extensive soil surveys in the district. Your sites are all close to mineralisation, which is useful for providing the fraction containing the highest element abundances. In soil sampling programmes it is the ability to recognise anomalies related to the target mineralisation which is all important. Thus the uniformity of the background population, the clarity of the threshold value, the peak : background ratio, and the lateral extent of the anomaly are important. You can only really test this by an orientation traverse from soils over barren country rock, through the mineralisation and back into country rock. The high Sn levels that occur in your Great Pyramid samples indicates that it would be difficult to miss the mineralisation using any fraction, but if more subtle anomalies are expected, then the above may be relevant.

Best regards.

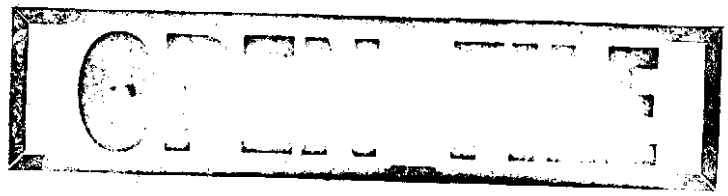
R. BEESON

495075

D of M | A.O. | C.G. | E.O. | B.B.E.
Received
Answered 2 9 ... 1983
E & IL
DEPT. OF MINES
REF. No. 10,930/83

LIST OF PLANS

Plan No.	Title	Scale
BHP	Scamander E.L. 12/78 - Summary of Previous Exploration	As shown
LH 02/1000	Scamander E.L. 12/78 - Geology & Aeromagnetic Anomalies	1:20 000
D/LH 02/502	Scamander E.L. 12/78 - Stream Sediment Sample Locations	1:20 000
D/LH 02/503	Scamander E.L. 12/78 - Stream Sediment Survey Sn, W, Mo	1:20 000
D/LH 02/504	Scamander E.L. 12/78 - Stream Sediment Survey Cu, Pb, Zn	1:20 000
D/LH 02/505	Scamander E.L. 12/78 - Stream Sediment Survey As	1:20 000
D/LH 01/555] D/LH 01/556]- D/LH 01/557]	Pinnacles Grid - Soil Sample Results - Sn, WO_3, As	1:2 000
D/LH 01/558] D/LH 01/559]- D/LH 01/560]	Pinnacles Grid - Soil Sample Results - Cu, Pb, Zn	1:2 000
D/LH 01/526] D/LH 01/528]- D/LH 01/527]	Pinnacles Grid - Topography & Outcrop	1:2 000
D/LH 01/561] D/LH 01/562]- D/LH 01/563]	Pinnacles Grid - Lithology & Structure	1:2 000
D/LH 01/530] D/LH 01/564]- D/LH 01/529]	Pinnacles Grid - Mineralization/Tourmaline & "Pyramid-style" fracture distribution	1:2 000



OPEN FILE

EL 12/78

"Constables Creek" – Geophoto

Geophysics : none

Geochemistry : Austminex stream samp
Geophoto soil samp!

Drilling : 5 DD holes.
– 3 holes Geophoto 1970
narrow intersections, low grade Sn (to 0.3%), W (to 0.2%) Bi (to 0.2%).
– also Cobra drilling

"Loila Tier"

CGFA : Geochem: stream, soil, rock
– 24 pits, 6 costeans
– Sn, W.

"Upper Scamander Anomaly"

Geophoto : Geophysics : 2 I.P. lines, full I.P. survey
: Geochem : rock chip sampling
: Drilling : 1 DD hole 78m Cu, Pb, Zn, Ag.

DDH

"Drieco"

Geophysics : none

Geochem : Austminex, 1965 : rock and stream sediment sampling.

Drilling : 2 DD holes, T.M.D.
Scamander Mining.

"Great Pyramid"

Geophysics : ground magnetics

Geochem : bulk sampling, soil sampling underground development

Drilling : 150 percussion holes
11 . DD holes.
Tas Mines Dept. : B.H.P.
Paringa – Aberfoyle

"Copper Show Creek"

Geophoto: Geophysics : 3 I.P. lines

Drilling : 2 DD holes

EL 12/78

EL 10/80

"North Scamander" E.Z. Co.

Geophysics: 4 lines reconn. VLF Fluxgate magnetometer, Puranen Dual frequency EM. survey.

Geochem: stream sed., rock chip sampling.
Soil sampling on grid with 5000' baseline for Cu, Pb, Zn, Defined 300×600m anomaly

Drilling: 1 DDH to 45m
1.2m intersection of 4.4% Zn, 1.5% Pb, 0.1% Cu

"Lutwyche"

Geophoto: 600×700m grid

Geochem: 57 rock chips Mo, Bi, W, Sn.

Drilling: 4 DD holes Cu, Mo, Bi, W, Sn.

EXPLANATION

- BHP Stream Sample Location (documented separately)
- Austminex Stream Sample Location
- Geophoto - " "

0 500 1000 2000 3000 4000 METRES

SCALE
1:31680
2" = 1 mile

5 cm

True North

UPPER SCAMANDER AREA

SUMMARY OF PREVIOUS EXPLORATION.

83-2051

Revisions:

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

SCAMANDER EL 12/78

Summary of Previous Exploration

Drawn	Date	Centre
R.H.	~~14-6-79~~ 24-6-80	HOBART
Traced		
Checked		
O.I.C.		

Project No: Z010

Drawing No: BHP

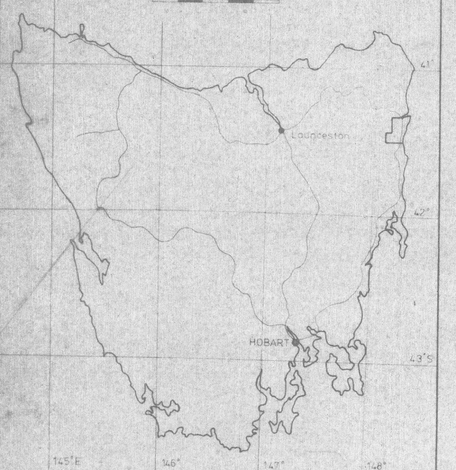
Fig. No.
To accompany
Dated

49076

Fig.

TASMANIA
LOCALITY MAP
EL 12/78

0 20 40 60 80 100 Kms



595 000m E
600 000m E
605 000m E
595 000m E

STONEY FORD
MEDBAS COVE
Medbas Cove Road
GEORGES BAY
BEAUTY BAY
ST. HELENS
Ferntree Falls
Launceston Trafalgar Creek
Trafalgar Creek
Dorothea Creek
SILVER ECHO Ag Pb
MT ECHO
Coastline Creek
Jurgurt Creek
Argus Creek
ECHO W. Mo
Boggy Creek
Brookes Hill
TASMAN HIGHWAY
Basin Creek
Diana's Basin
Diana's Basin Road
Arm Creek
Alps Road
Alps Creek
Holyoak Creek
Tu
Dg 5
Dg 12
Dg 14
Sm
Sm?
Bl gnt
2-1
2-2
2-3
2-4
2-5
2-6
2-8
2-9
2-10
2-12
2-13
1-1
1-2
1-3
1-4
1-5
1-6
1-7
1-8
1-9
1-10A
1-10B
1-10C
1-10D
1-10E
LOILA TIER
LOILA PINNACLE
WEST PINNACLE
EAST PINNACLE
PYRAMID
ORIECO HILL
ORIECO Cu
DUNNS Pb Ag
RINGAROOMA Cu
PITTS HILL
NORTH SCAMANDER
Upper Scamander
SCAMANDER RIVER
SCAMANDER
BEULAH Pb Ag
SCAMANDER FALLS
SCAMANDER Pb Ag
YARMOUTH Pb Ag
BADEN POWELL W Mo
CARSON DE BEERS W Mo
LUTWYCHE W Mo
CRAIGS Cu
Skyline Tier
Henderson Lagoon
F
F?

5 cm

Dolerite / diorite dykes
Other magnetic trends
BHP Aeromag anomalies
Broad magnetic zone

LEGEND

Bedding, facing determined
Bedding, facing not determined
Lineament
Shear Zone
Gossanous rocks, ironstones
Hard rock mines, prospects
Quartz veins
Aplite
Quartz-feldspar porphyry

Tu — Tertiary – undiff. — sand, silt, gravel
Pss — Permian – sandstone, conglomerate
Sm — Silurian – Lower Devonian, Mathinna Beds, quartzite, slate

Igneous Rocks
Jdl — Jurassic – dolerite
dio — Upper Devonian (?) – diorite
Upper Devonian granitic rocks, subdivision in St Helen's area after Groves, Cocker and Jennings, 1977 (Geol. Survey Tas. Bull 55)
Biotite-(muscovite) granite
Biotite-microgranite

SCALE 1:20,000
0 1 2 Km
5 cm

N (Amg)

595 000m E
600 000m E
605 000m E
5425 000m N
5420 000m N
5415 000m N
5410 000m N
5405 000m N

STONEY FORD
Dg 5
Dg 12
Dg 14
MEDEAS COVE
Medeas Cove Road
STIEGLITZ
GEORGES BAY
Point
St Helens
Tu
Fern tree Falls
Tranter Creek
Dunalley Creek
Constitution Creek
MT ECHO
SILVER ECHO
Ag Pb
ECHO
W Mo
ST. HELENS
BEAUTY BAY
Jocks Lagoon
Onion Creek
Boggy Creek
Brookes Hill
TASMAN HIGHWAY
Basin
Dianas Basin
Dianas Basin Road
Sm
Alps
Mount Elephant
PADDYS ISLAND
2-1
2-2
2-3
2-4
2-5
2-6
2-8
2-9
2-10
2-11
2-12
2-13
1-1
1-2
1-3
1-4
1-5
1-6
1-7
1-8
1-9
1-10A
1-10B
1-10C
1-10D
1-10E
F
F?
LOILA TIER
LOILA PINNACLE
WEST PINNACLE PROSPECT
EAST PINNACLE
ORIECO HILL
ORIECO Cu
DUNNS Pb Ag
PYRAMID Sn
RINGAROOMA Cu
PITTS HILL
NORTH SCAMANDER MAGNETIC
BALL BOAHR
CRAMPS
BADEN POWELL W Mo
CARSON DE BEERS W Mo
LUTWYCHE W Mo
YARMOUTH Pb Ag
BEULAH Pb Ag
SCAMANDER DELL
SCAMANDER Pb Ag
SCAMANDER
Upper Scamander
SCAMANDER RIVER
SKYLINE TIER
Henderson Lagoon
TASMAN SEA
Pss ?

5 cm

LEGEND

- Dolerite / diorite dykes
- Other magnetic trends
- BHP Aeromag anomalies
- Broad magnetic zone

- Bedding, facing determined
- Bedding, facing not determined
- Lineament
- Shear Zone
- Gossanous rocks, ironstones
- Hard rock mines, prospects
- Quartz veins
- Aplite
- Quartz-feldspar porphyry

- Tu — Tertiary – undiff. — sand, silt, gravel
- Pss — Permian – sandstone, conglomerate
- Sm — Siturian – Lower Devonian, Mathinna Beds, quartzite, slate

Igneous Rocks

- Jdl — Jurassic – dolerite
- dio — Upper Devonian (?) – diorite
- Upper Devonian granitic rocks, subdivision in St Helens area after Groves, Cocker and Jennings, 1977 (Geol. Survey Tas. Bull 55)
- Biotite-(muscovite) granite
- Biotite-microgranite

SCALE 1:20,000

0 — 2 Km

5 cm

N (Amg)

Magnetic North

15°

495077

The Shell Company of Australia Limited
METALS DIVISION

NORTH EAST TASMANIA

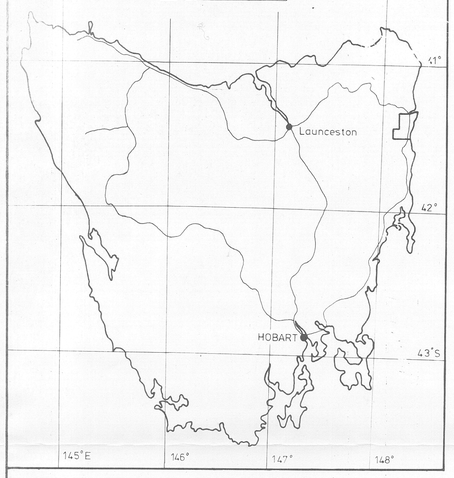
EL 12/78 SCAMANDER

GEOLOGY AND AEROMAG ANOMALIES

SCALE	1:20,000	DATE	June 1983
AUTHOR	N.H.	DRAWN	—
OFFICE	AHO	REP. No.	
DRG. No.	LH 02 / 1000	FIG. No.	

TASMANIA
LOCALITY MAP
EL 12/78

0 20 40 60 80 100 Kms



595 000m E
600 000m E
605 000m E
595 000m E

MEDEAS COVE
BAY
GEORGES
BEAUTY BAY
ST. HELENS
Medeas Cove Road
Ferntree Falls
MT ECHO
Nevrek
Tristagas
Launceston
Creek
Constable
Frogstar
Argus
ARGUS CR PROSPECT
ECHO
ECHO SOUTH
Creek
Boag
TASMAN
Brookes Hill
Basin
HIGHWAY
LOILA PINNACLE
PITTS HILL
Upper Scamander
SCAMANDER RIVER
Scamander Road
SCAMANDER
Dayles Mudflat
Henderson Lagoon
Steels
Beach
Eastern
Yarmouth
Reedy
Trumps
Approximate
Location
Only
Boltons
Ridges
Firebreak
Bare Hill
AVENUE
Wellington
Little
Hood
Ohio
Creek
Road
Track
Ridge
Hill
Basin
Arm
Dam
Beach
Bay
Point
Spur
Saddle
Plain
Flat
Lagoon
Lake
Mountain
Peak
Range
Valley
Gully
Swamp
Forest
Scrub
Cliff
Rock
Stream
River
Tributary
Junction
Confluence
Bridge
Ford
Crossing
Fence
Gate
Boundary
Survey Peak
Trig Station
Benchmark
Spot Height
Contour
Metres
Feet
Chain
Link
Pole
Post
Wire
Cable
Pipeline
Power Line
Telephone Line
Building
Hut
Shed
Tank
Dam
Well
Bore
Windmill
Pump
Tap
Sign
Notice
Warning
Danger
Keep Out
Private
Public
Access
Track
Road
Highway
Freeway
Bypass
Detour
Intersection
Roundabout
Traffic Lights
Stop
Give Way
Speed Limit
One Way
No Entry
Parking
Toilet
Shelter
Picnic
Camping
Caravan
Boat Ramp
Jetty
Wharf
Pier
Marina
Anchorage
Mooring
Buoy
Beacon
Light
Lighthouse
Radio
Television
Antenna
Satellite
Dish
Solar Panel
Battery
Generator
Transformer
Substation
Pylon
Tower
Mast
Flag
Pole

595 000m E

600 000m E

605 000m E

5425 000m N

5420 000m N

5415 000m N

5410 000m N

5405 000m N

Kms

11°

42°

43°S

148°

Launceston

Ferntree Falls

MT ECHO

Trafalgar Creek

Nepheni Creek

Constable Creek

Argo Creek

MEDEAS COVE

Medeas Cove Road

ST. HELENS

BEAUTY BAY

GEORGES BAY

STIEGLITZ

St Helens Point

Jocks Lagoon

Onion Creek

TASMAN HIGHWAY

Brooklyn Hill

Basin

Arm

Dark Hollow

PADDYS ISLAND

TASMAN SEA

Eastern Creek

Falmouth Road

Freshwater Creek

Beaumaris

Doyles Mudflat

Henderson Lagoon

Steels Creek

LOILA PINNACLE

PITTS HILL

Upper Scamander

SCAMANDER RIVER

Scamander Road

SCAMANDER

Boobyalla Creek

Location Creek

Boobyalla Ridge

Bowers Creek

Approximate

BLACK TOMMYS HILL

Wildfern

Trig

Summit

Saddle

Ridge

Creek

Road

Track

Beach

Bay

Point

Hill

Basin

Arm

Hollow

Dark

Jocks

Lagoon

Onion

Brooklyn

Henderson

Doyles

Mudflat

Freshwater

Falmouth

Eastern

Wildfern

Location

Boobyalla

Bowers

Approximate

Scamander

Upper

Pitts

Loila

Pinnacle

Black

Tommys

Hill

Paddys

Island

Tasman

Sea

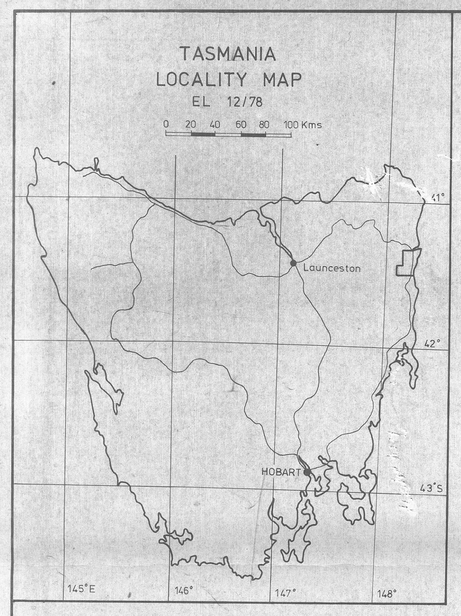
5 cm

N

5 cm

SCALE 1:20,000

0 1 2 3 Kms



595 000m E

600 000m E

605 000m E

590 000m E

595 000m E

THE BROKEN HILL PROPRIETARY CO LTD
EXPLORATION DEPARTMENT

EL 12/78, SCAMANDER, TAS.

STREAM SEDIMENT SURVEY
GEOCHEMISTRY
As

Drawn: P.A.R.	Date: 8-7-83	Centre: DEVONPORT	
Traced: J.L.L.			
Checked		Project No: T 610	Drawing No: D/LH02/503
O.I.C.			

Revisions:

495079

5 cm

N

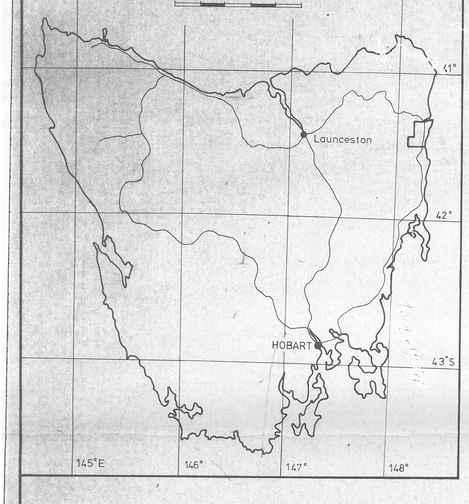
SCALE 1:2

0 1

595 000m E
600 000m E
605 000m E
5425 000m N
5420 000m N
5415 000m N
5410 000m N
5405 000m N
148°
43°S
42°
41°
Launceston
Ems
5 cm
5 cm
SCALE 1:20,000
0 1 2 3 Kms
N
STIEGLITZ
MEDEAS COVE
Medeas Cove Road
GEORGES BAY
St Helens Point
BEAUTY BAY
ST. HELENS
Jocks Lagoon
Onion Creek
Little Basin
Diana Basin
Beach
Road
Creek
Basin
Arm
Alps
Dark
Hollow
Reedy
Eastern
Yarmouth
Freshwater
Beaumaris
Wrinklers Lagoon
PADDYS ISLAND
TASMAN SEA
HIGHWAY
TASMAN
Ferntree Falls
Launceston
Trafalgar
Nephele
MT ECHO
Constable
Argus
Flagstaff
Boggy
Brookes Hill
SCAMANDER
LOILA TIER
Gramps
Gramps
Scamander
Road
Fitzgerald
Wolfram
LOILA PINNACLE
ORIFORD HILL
PITTS HILL
Upper Scamander
RIVER
SCAMANDER
SCAMANDER RIVER
Doyles Mudflat
Henderson Lagoon
Steels
BLACK TOMMYS HILL
Approximate
McINTYRE
Baldrys Ridge
Baldrys
Location
Wrinklers
Creek
Road
Beach
HIGHWAY
SKYLINE
TASMAN

TASMANIA
LOCALITY MAP
EL 12/78

0 20 40 60 80 100 Kms



595 000 m E
600 000 m E
605 000 m E
590 000 m E

Ferntree Falls
Launceston Trafalgar Creek
Nephele Creek
MT ECHO
Constable Creek
ARGUS PROCT
Echo
ECHO SOUTH
Frigistat Creek
Argo Creek
Boggy Creek
MEDEAS COVE
Medeas Cove Road
GEORGES BAY
BEAUTY BAY
ST. HELENS
Brookes Hill
TASMAN HIGHWAY
Diana's Basin
Basin
Oldings Arm
Crackers Creek Road
Dark Hollow Creek
Reedy Creek
Eastern Creek
Yarmouth Creek Road
Freshwater Creek
Wrinklers Lagoon
Beaumaris Beach
Steels Beach
Dayles Mudflat
Henderson Lagoon
LOILA PINNACLE
LOILA TIER
Ettrgerald
Weatherston
Eastern
Creek
Road
Scamander River
Upper Scamander
SCAMANDER
SCAMANDER TIER
SKYLINE
Upper Scamander Road
McIntyre Creek
Location Creek
Boltons Ridge
Boltons Creek
Burns Creek
Huntsmans Creek
Little Back Hill Creek
Back Hill Creek
Gully Creek
Firebreak No 49
Cutts Road
BLACK TOMMYS HILL
PITTS HILL
BRIEC CO HILL

5 cm

SCALE 1:

0 1

N

Revisions:			
Drawn: P.A.R.	Date: 7-7-83	Centre: DEVONPORT	
Traced: J.L.L.		Project No: T 610	Drawing No: D/LH02/504
Checked: O.I.C.			

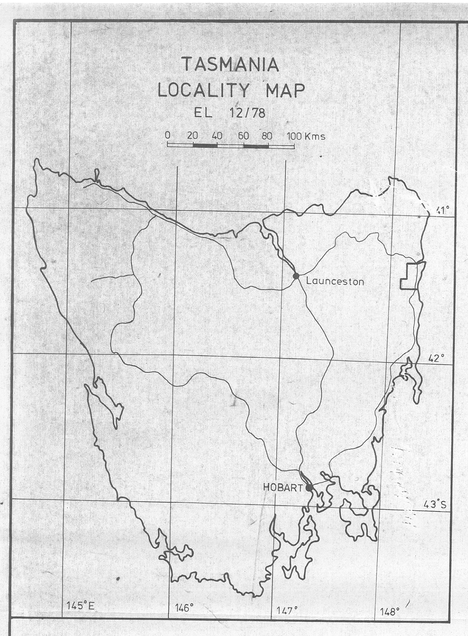
THE BROKEN HILL PROPRIETARY CO LTD.
EXPLORATION DEPARTMENT

EL 12 78 , SCAMANDER , TAS.

STREAM SEDIMENT SURVEY
GEOCHEMISTRY-
Sn, W, Mo.

48080

595 000m E
600 000m E
605 000m E
5425 000m N
5420 000m N
5415 000m N
5410 000m N
5405 000m N
41°
42°
43°S
148°
unceston
STIEGLITZ
MEDEAS COVE
Medeas Cove Road
GEORGES BAY
St Helens Point
BEAUTY BAY
ST. HELENS
Ferntree Falls
Launceston Creek
Trailgor Creek
Track
Neophele Creek
MT ECHO
Constable Creek
ARGUS PROCT
ECHO
ECHO SOUTH
Argus Creek
Hogarth Creek
Boggy Creek
Jocks Lagoon
Onion Creek
Brookes Hill
TASMAN HIGHWAY
Little Basin
Dianas Basin
Dianas Beach
Road
Basin
Crockers Arm
Dark Hollow Creek
PADDYS ISLAND
Reedy Creek
Eastern Creek
Yarmouth Creek
Freshwater Creek
Coach Creek
Beaumaris
Wrinklers Creek
Wrinklers Lagoon
Steels Beach
Henderson Lagoon
TASMAN SEA
LOILA PINNACLE
ORIELTON HILL
PITTS HILL
Fitzgerald Creek
Wiltrim Road
Eastern Creek
Upper Scamander
SCAMANDER RIVER
Scamander Road
SCAMANDER
Dayles Mudflat
Approximate
McIntyre Creek
Location Creek
Mollie Ridge
Bolpers Ridge
Bolpers Creek
Binns Creek
Cooks Creek
Cooks Road
Forks Creek
BLACK TOMMYS HILL
No 67
Sanders Road
Ding Ding Creek
Skyline Track
Tier Creek
Tier Road
Cramps Creek
Cramps Road
Tips Creek
Tips Road
Sawyers Creek
Sawyers Road
Ridge Road
Creek
Road
Arm
Basin
Beach
Point
Lagoon
Bay
Cove
Hollow
Ridge
Track
Tier
Sawyers
Cramps
Tips
Sawyers
Sanders
Ding Ding
Skyline
Tasman
Scamander
Upper
Eastern
Yarmouth
Freshwater
Coach
Wrinklers
Steels
Dayles
Mudflat
Henderson
Lagoon
Wiltrim
Fitzgerald
Mollie
Bolpers
Binns
Location
Sworkes
McIntyre
Approximate
Cooks
Forks
Tier



595 000m E

600 000m E

605 000m E

595 000m E

TASMAN SEA

MEDEAS COVE

GEORGES BAY

BEAUTY BAY

ST. HELENS

Medeas Cove Road

Ferntree Falls

Launceston Creek

Trafalgar Track

Nephele Creek

MT ECHO

Constable Creek

Figgis Creek

Argus Creek

ARGUS PROCT

ECHO SOUTH

Boggy Creek

Brookes Hill

Diana Basin

Crackers Arm

Dark Hollow

Reely Creek

Eastern Creek

Yarmouth Creek

Freshwater Creek

Wrinklers Creek

Wrinklers Lagoon

Beach

Boundaris

HIGHWAY

TASMAN

SCAMANDER

SCAMANDER RIVER

Upper Scamander

Scamander Road

Doyles Mudflat

Henderson Lagoon

Steels Beach

LOILA PINNACLE

LOILA TIER

PITTS HILL

TIER 2 SKYLINE

Fitzgerald Creek

Western Creek

Eastern Creek

Kent Creek

Cramps Creek

Tramps Creek

Dorset Creek

Lords Creek

Wattle Creek

Bolpeys Ridge

Bolpeys Creek

Bims Creek

McIntyre Creek

Approximate Location

Sawpit Creek

Dry Creek

Little Hop Creek

Long Gully Creek

Burk Hop Creek

BLACK TOMMYS HILL

Huntsmans Road

Coals Road

Firebreak No 40

RIVER AVENUE

N

SCALE 1:2

0 1

5 cm

THE BROKEN HILL PROPRIETARY CO LTD
EXPLORATION DEPARTMENT

EL 12 78 , SCAMANDER , TAS.

STREAM SEDIMENT SURVEY
GEOCHEMISTRY
Cu, Pb, Zn

Drawn: P.A.R.	Date: 8-7-83	Centre: DEVONPORT	
Traced: J.L.L.	Project No: T 610	Drawing No: D/LH02/505	
Checked:			
O.I.C.			

Revisions:

49C081

595 000m E
600 000m E
605 000m E
5425 000m N
5420 000m N
5415 000m N
5410 000m N
5405 000m N
41°
42°
43°S
148°
launceston
ns
Ferntree Falls
Launceston
Tralalgar
Creek
Nephele
MT ECHO
Constable
ARGUS PROCT
ECHO
ECHO SOUTH
Flagstaff
Argus
Creek
MEDEAS
COVE
Medeas Cove
Road
GEORGES
BAY
BEAUTY
BAY
ST. HELENS
STIEGLITZ
St Helens
Point
Jocks
Lagoon
Onion
Haggy
Brookes Hill
TASMAN
HIGHWAY
Little
Basin
Dianas Basin
Dianas
Beach
Basin
Crackers
Arm
Alps
Road
Dark
Hollow
PADDYS
ISLAND
Reedy
Eastern
Tarmouth
Freshwater
Coach
Wrinklers
Lagoon
Beaumaris
Doyles
Mudflat
Henderson
Lagoon
Steels
SCAMANDER
RIVER
Upper
Scamander
Road
LOILA PINNACLE
DRIEGS
HILL
PITTS
HILL
Cramps
Fitzgerald
Wolfram
Kelly
Basin
SKYLINE
TIER
ROAD
Approximate
McIntyre
Location
Balpers
Ridge
Wolfram
Creek
Hunters
Hop
Gully
Tyrrells
Gate
Track
No 49
BLACK TOMMYS
HILL
TASMAN
SEA
SCAMANDER
RIVER
Creek
Road
Track
Ridge
Basin
Arm
Beach
Point
Lagoon
Bay
HIGHWAY
Eastern
Tarmouth
Freshwater
Coach
Wrinklers
Beaumaris
Doyles
Mudflat
Henderson
Lagoon
Steels
Dianas
Onion
Haggy
Brookes Hill
Jocks
Lagoon
PADDYS
ISLAND
Reedy
Dark
Hollow
Alps
Crackers
Arm
Dianas Basin
Little
Basin
Medeas Cove
Road
COVE
MEDEAS
BAY
GEORGES
BEAUTY
BAY
ST. HELENS
STIEGLITZ
Point
St Helens
Ferntree Falls
MT ECHO
Launceston
Tralalgar
Nephele
Constable
Flagstaff
Argus
ARGUS PROCT
ECHO
ECHO SOUTH
LOILA PINNACLE
DRIEGS
HILL
PITTS
HILL
Cramps
Fitzgerald
Wolfram
Kelly
Upper
Scamander
SCAMANDER
RIVER
SCAMANDER
Road
SKYLINE
TIER
ROAD
Approximate
McIntyre
Location
Balpers
Ridge
Hunters
Hop
Gully
Tyrrells
Gate
Track
No 49
BLACK TOMMYS
HILL
TASMAN
SEA
Creek
Road
Track
Ridge
Basin
Arm
Beach
Point
Lagoon
Bay
HIGHWAY
Eastern
Tarmouth
Freshwater
Coach
Wrinklers
Beaumaris
Doyles
Mudflat
Henderson
Lagoon
Steels
Dianas
Onion
Haggy
Brookes Hill
Jocks
Lagoon
PADDYS
ISLAND
Reedy
Dark
Hollow
Alps
Crackers
Arm
Dianas Basin
Little
Basin
Medeas Cove
Road
COVE
MEDEAS
BAY
GEORGES
BEAUTY
BAY
ST. HELENS
STIEGLITZ
Point
St Helens
Ferntree Falls
MT ECHO
Launceston
Tralalgar
Nephele
Constable
Flagstaff
Argus
ARGUS PROCT
ECHO
ECHO SOUTH
LOILA PINNACLE
DRIEGS
HILL
PITTS
HILL
Cramps
Fitzgerald
Wolfram
Kelly
Upper
Scamander
SCAMANDER
RIVER
SCAMANDER
Road
SKYLINE
TIER
ROAD
Approximate
McIntyre
Location
Balpers
Ridge
Hunters
Hop
Gully
Tyrrells
Gate
Track
No 49
BLACK TOMMYS
HILL
TASMAN
SEA
6,12,12
6,20,36
12,30,22
10,24,36
8,8,10
8,6,8
8,10,16
4,14,36
8,24,8
12,22,46
10,26,12
10,20,40
10,12,8
22,18,50
18,55,32
12,22,28
14,34,46
12,14,38
14,26,50
36,16,85
6,4,16
32,22,70
16,23,46
14,36,44
12,8,32
20,18,46
12,90,65
14,30,55
22,16,60
6,10,10
28,24,55
16,14,42
18,24,48
36,16,26
16,32,48
10,22,36
14,44,60
12,12,30
33,32,32
22,20,60
30,18,55
14,30,60
16,55,75
14,70,55
4,6,8
24,22,55
14,26,48
26,18,32
18,32,60
22,16,50
2×4,8
4,10,22
6×4,8
4,4,6
4<4,6
4,6,8
16,30,70
30,29,50
20,34,65
32,14,48
16,38,80
48,46,100
6,12,26
10,8,26
16,16,48
28,24,60
30,16,48
18,62,90
20,26,68
30,75,80
36,55,95
36,36,80
42,32,80
16,48,75
18,46,80
26,62,85
14,<4,8
48,22,70
60,30,110
18,55,90
24,44,85
16,16,60
28,28,55
36,12,65
42,24,60
15,68,110
20,65,120
14,75,180
10,8,20
10,12,24
28,16,80
80,48,150
85,38,100
48,38,65
28,18,75
20,50,110
100,50,65
300,160,220
95,42,140
16,14,65
14,14,38
34,16,170
26,10,38
24,60,90
28,70,300
28,20,120
4,18,36
18,48,75
20,55,85
26,32,85
20,28,65
12,18,70
18,30,70
18,36,70
55,50,140
22,42,48
16,50,75
16,32,44
14,28,120
20,30,100
36,38,80
12,38,75
10,22,60
10,22,55
46,36,60
32,12,46
30,24,60
24,12,65
28,14,95
12,10,38
26,14,65
28,14,10
100,44,46
75,26,42
24,40,48
30,28,60
50,56,64
20,26,42
60,22,70
14,10,90
24,18,65
20,36,95
18,32,80
44,24,75
18,80,75
14,48,150
16,36,44
12,10,30
20,20,34
10,20,55
48,18,50
38,18,26
55,18,75
14,38,70
26,12,140
12,6,28
14,26,65
16,24,34
36,24,55
34,26,110
32,22,55
20,32,65
20,28,36
28,26,60
32,24,75
26,26,75
24,28,65
18,24,60
24,22,55
26,24,80
29,26,95
28,32,55
16,22,75
38,55,100
8,<4,14
18,36,85

	000 W	100 W	200 W	300 W	400 W	500 W	600 W	700 W	800 W	900 W
600 N	14, <10, 22	8, <10, 18,	10, <10, 18	10, -10, 22	8, <10, 10	22, <10, 10,	220, <10, 24	22, <10, 10,	18, <10, 16,	38, <10, 18,	250, 15, 16,
	24, <10, 14	10, <10, 22	12, 15, 14	12, <10, 9	16, 10, 10,	44, 10. 28,	42, <10, 34	38, <10, 22,	8, 10, 24	24, <10, 16,	130, 15, 34
500 N	20, <10. 20	6, <10, 8	24, 15, 16	18, 10, 32	16, 15, 22	20, <10, 30	14, <10, 42	18, 10. 10	65, 10, 8	28, <10, 18	70, <10. 44
	26, 15, 70	55, 10, 10	75, 10. 30	34, 15, 42	26, 10, 18	30. <10. 38	16, <10, 48	14, <10, 28	22, <10, 24	32, <10, 28	135, <10. 46	20, <10. 9	18, <10, 10	44, 15, 46
400 N	230, 10, 22	18, 10. 26	28, 10. 18	22, <10, 22	12, <10. 30	18, <10, 18	30, <10, 42	16, <10, 20	40, 10, 42	20, 10. 26	70, 10. 90	12, <10, 20	12, <10, 18	150. 15, 145
	28. 10, 26	10. <10, 28	22. <10, 34	48. 10, 32	24, 15, 22	20. 10, 20	18, 10, 32	28, <10, 85	34, <10, 28	26, <10, 26	42, <10, 6	24, <10, 16	26, 10, 22,	60, <10, 20
300 N	76, <10, 42	29, 10, 28	100, <10, 60	26, 10, 40	22, <10, 36	16, <10, 60	70, <10, 70	55, 10.80	310, <10.50	46, <10, 18	50, <10, 7	16, 10, 10	20, 15, 18	18, <10. 65	65, 15, 20
	40, 10. 22	195, <10, 26	135, 10, 125	50, 20, 155	48, <10, 60	28, <10, 55	48, 15, 100	180, <10, 120	42, <10, 18	20, <10, 10	14. <10. 14	28, <10. 10	22. <10, 16	16, <10. <2	90, 15. 6
200 N	420, <10, 40	145, <10, 50	140, 10, 36	95, <10, 70	115, 10, 55	120, <10. 40	26, <10, 8	22, 10, 12	75, 10, 48	50, 15, 18	6, <10, 9	60, <10, 10	60, 10, 60	65. 10. 30	90, <10. 10
150 N	80, <10, 32	60, 15, 36	75, 15, 26	40, <10, 28	110, <10, 46	125, <10, 36	110, 15, 16	75, 10, 9	28, 10, 4	8, <10, 20 34, 15, 10	20, <10, 10 48 <10, 12	16, 16, 8 20, 20, 44	11, <10, 16 10, 10, 9	8, <10, 50 44, 25, 10	70, <10, 9
100 N	76, 15, 42	55, <10, 32	70, 20, 44	32, <10, 14	110, <10, 75	44, <10, 12	26, <10, 12	44, 15, 8	22, 10, 36 32, 15, 2	24, 10, 18	30, 15, 10	55, <10, 9	12, 10, 18	14, <10, 24	990, 15, 165
	48, <10, 16	16, <10, 7	22, <10, 36	150, 15, 48	16 <10, 10	65, 20, 20	16, 10, 8	16, <10, 20	24, <10, 14	70, <10, 16	870, 20, 46
00	60, <10, 38	30, 10, 16	26, 15, 14	55, <10, 48	22. <10, 16	14. <10, 14	22, 15, 34	24, 10, 20	38, <10, 12	195, <10, 145	105, <10, 42
	42, 10, 80	70, 15, 75	55, 10, 70	36, 15, 65	85, 40, 10	30, 15, 9	<4, <10, 7	8, <10, 7	26, 10, 9	46, 10, 185	28 <10, 26
100 S	22, 15, 55	80, 10, 320	65, 15, 140	26. 10, 70	32. <10, 24	14. <10, 6.	12, 10, 14	4, <10. 6.	88, 15, 7	46. 10, 130	36, 15, 175
	38, 15, 18	40, 20, 80	30, <10, 70	70, 10, 48	26. <10, 30	24. <10, 6	6. <10, 24	12. <10, 10	44. 10. 12	38. <10, 195	10, <10, 60
200 S	75, 15, 14	55. 10. 5.	175. <10, 12.	85. <10. 32.	10, <10. 22.	10, 10, 20	14, 10, 10	46, 10, 14	140, 15, 36	120, <10. 135	4. <10, 36
	50, 10, 7	65, <10, 7	55, 10, 28	34, 15, 10	14. <10, 20	8, <10, 12	12, 15, 20	200, 10, 60	270, 15, 250	125, <10, 115	8, <10, 20
300 S	75, 10, 22	60, <10, 3	26, 10, 4	70, 10, 2	14, 15, 4.	6, 20, 7.	10. <10, 14,	230, 20. 480	310, <10, 85	26, <10, 10	10, <10, 12,
	65, 10, 44	46, <10, 5	55. 15, 22	85, 15, 24	24, 10, 6	12, 15, 10	28, <10, 24	740, <10, 280	500, <10, 70	26, 10, 10,	4., 15, 10
400 S	105, 10, 5	18, 20. 18	48, <10, 34	36, <10, 34	44, 10, 8	20, <10, 16	30. 15, 170	260, 10, 135	165, 10, 48	24, 15, 85	4, <10, 10

Sn, WO_3, As

Analyses in p.p.m.

N

40 20 0 50 100m
50 30 10

The Shell Company of Australia Limited
METALS DIVISION

E.L. 10/80 GREAT PYRAMID - PINNACLES GRID
SOIL SAMPLE RESULTS
Sn, WO_3, As

SCALE	1:2000	DATE	6-10-83
AUTHOR	P.R.	DRAWN	J.L.L.
OFFICE	DEVONPORT	REP. No.	
ENCL No.		DRG No.	D/LH01/555

495082

5 cm

2000 W														1500 W								1000 W
600 N	18, 20. 50		22, 15, 125	46, <10, 18	30, 10, 55	110, <10, 4	44, <10, 10	42, <10, 12	44, <10. 16	36, <10, 20	80, 15, 40	40, 10, 38	18, 10, 20		10, <10, 14		6, <10. 22		28, <10, 22		14, <10, 22	
	12, 10, 28		18, 15, 100	80, 10, 18	26, 25, 46	38, 10, 42	30, 15, 130	66, <10, 26	40, 10, 34	80, <10, 30	26, <10. 50	22, 10, 55	38, <10 , 130		26, 15, 44		26, <10, 28		40, <10, 16		24, 10. 14	
500 N	26, 10, 55		19, 15, 50	24, <10, 220	44, 10, 310	34, 15, 1300	32, 15, 180	32, 20, 165	730, 15, 26	240, 10, 100	44, <10, 200	70, <10, 115	75, 15, 120		55, 20, 75		22, 10, 24		26, <10, 24		20, <10, 20	
	46, 10, 160		44, 10, 180	28, 15, 220	48, 25, 76	34, 30, 390	220, 10, 130	120, 15, 160	80, <10 , 250	95, <10, 55	105, 10, 32	60, 15, 38	90, 10, 34	80, 10, 70	75, 10, 75	85, 20, 70	36, 10, 36	70, 10, 20	40, 10, 24	46. 15. 14	26, 15, 70	
400 N	46, <10, 60		32, 15, 200	60, <10, 65	60, <10, 210	38, <10, 140	65, <10, 28	34, 10, 24	66, <10, 48	85, <10, 22	155, <10, 20	75 <10 , 125	42, 15, 38	100, 10, 32	80, 20, 100	95, 10, 65	80, 10, 22	80, 15, 22	38, 30, 40	30, 15, 12	230, 10, 22	
	28, <10, 75		44, 10, 80	46, <10, 195	44, 15, 44	60, <10, 55	100, 20, 75	120, <10, 65	70, 15, 28	75, 10, 18	85, 20, 12	80, 15, 16,	30, <10, 50	165, <10, 40	30, <10, 38	195, <10, 42	240, <10, 75	30, 15, 55	36, <10, 30	50, 10, 42	28, 10, 26	
300 N	100, <10, 85		30, <10, 10	360, 15, 85	175, 10, 18	46. 15, 126	260, 10, 110	170, <10, 14	55, 20, 14	38, <10. 10	10, 15, 3	80, <10, 8	190. <10. 34	155, 10, 16	220, <10, 60	490, 10. 26	200, 10, 44	270, 15, 26	40, 10, 200	28, 20, 8	75, <10 , 42	
	22, 15, 110		30, 10, 115	24, 10, 80	32, <10, 38	44, 10, 34	145, <10, 55	55, 10, 12	95, 10, 140	95, <10, 28	48, 16, 12	90, <10, 16	95, 10, 5	125, <10, 24	420, 10, 16	680, 10, 20	85, 10, 26	46, 10, 12	42, <10, 14	55, <10, 20	40, 10, 22	
200 N	24, <10, 200	14, <10, 85	24, <10, 55	34, 10, 110	75, <10, 36	42, 10, 24	32, 10, 30	146, 15, 18	150, <10 , 24	65, <10. 60	48, 10, 32	85, 15, 40	75, 15, 12	85, 10, 16	1600, 10, <2	470, 10, 32	180, <10, 16	610, 10, , 5	610, 20, 12	310, 10, 14	420, <10, 40	
	60, <10, 210	65, 10, 170	115, 15, 310	195, 15, 250	620, 20, 195	620, 20, 195	490, 15, 330	125, 15, 220	280, <10. 75	160, <10, 48	430, 20, 300	310, 10, 16	140, 15, 12	85, <10, 16,	20. 15, 4	160, 25, <2	75, <10, 42	190, <10, 18	115, <10, 38	95, <10, 40	80, <10, 32	
100 N	60, 10, 190	70, <10, 175	270, 15, 640	210, 15, 750	510, 15, 330	290, 15, 230	210, 10, 80 (65)	160, 20, 190	185, 15, 195	70, 10, 110	220, 10, 55	210, 25, 65	155. 10. 60	320. 10, 65	600, 15, 30	120, 15, 80	22, <10. 42	145, 10, 46	110, 15. 34	60, 15, 38	75, 15. 42	
100 S	48, 10, 230	90, 15, 60	330, 15, 220	230, 20, 390	290, 20, 175	240. 10, 380	195, 15, 175 (165)	550, 15, 250	230, 20, 240	100, 10, 130	310, 10, 1330	90, 10 150	65, 15, 70	175, 10, 150	260. 10, 85	135, 10, 55	42, 15, 31	118, 15, 70	48. <10, 44		48, <10, 16	
00	44, <10, 46	28, 15, 80	55. 15, 65	30, 10, 55	170, 15, 390	370. 10, 410	185, 10. 130 (70)	450, 20, 800	190, 20, 735	48, 15, 50	85, 10, 46	105, 10, 26	75, 20, 40	28, 15. 26	90, 20. 28	85, 10, 55	75, <10, 70	48, <10, 70	26, 20, 18		60, <10, 28	
100 S	38, <10, 75	30, 10, 115	60, 15, 310	65, 10, 80	70, <10, 105	115, 10, 135	230, 10, 70	105, 15, 270	100, <10, 200	690. 40, 260	250, 20, 155	65, 10, 105	120, <10, 170	130, <10, 105	115, <10, 70	85, 10, 65	75, 15, 130	350, <10 35	75, 10, 55		42, 10. 80	
	32. 15, 60	70, 15, 60	290. 15, 85	70, 15, 140	105, 10, 110	115, 10, 190	120, <10, 135	90, 10, 185	400, 10, 190	1100. 10, 66	630. 10, 155	390, 10, 570	32. 15, 55	115, 15. 570	40, 10, 16	740, 15, 50	44, <10, 75	80, 10, 55	85, 10. 42		32. 15, 55	
200 S	40, 10, 100	42, 15, 120	115, <10, 85	42, 20, 55	70, <10, 150	60, <10, 280	125, 10, 340	150. 10, 48	220, <10. 70	125. 15, 200	180. 10, 125	340. 10, 120	130, 15. 160	140, <10, 120	175, 10, 46	860, 15, 30	150, <10, 60	212, 15, 66	24, 10. 42		38, 15. 18	
	60, 10, 155	90, <10, 95	55, 10, 85	44. 25, 125	70, <10, 170	50, 10, 340	38, <10, 55	140, 10, 70	145, 70, 160	170, 15, 66	240. 10, 46	12, <10, 115	170, 10. 65	1450. 10, 115	310, 15, 120	155, <10, 20	48. 15, 30	120, 10, 30	55, 10, 36		75, 15, 14	
300 S	40, 10, 75	46. <10, 65	30, <10. 100	32, <10, 125	34, <10, 60	155, <10, 110	90, <10, 145	320, 10, 165	135, 10, 110	650. 10, 60	28, 15, 130	115, 10, 65	125, 10. 155	330, <15, 65	210, 10, 80	150, <10, 14	75, 10, 28,	555, 10, 60	36, <10, 70		50, 10, 7	
	22, <10, 36	18. <10, 18	24, <10. 26	26, 10, 18	50, 10, 30	20, 10, 60	200, 10, 50	290. 25, 195	115, 10, 450	36, 10, 85	55, 10, 26	56, <10. 105	320, <10. 35	75, <10, 105	210, <10, 175	16, 10, 36	100, 10, 34	370, 10, 55	48, 10, 65		75, 10, 22	
400 S	16, <10, 18	12, <10, 7	12, <10, 12	28, <10, 12	36, <10, 18	38, 15, 5	20, 10, 16,	24, 10, 10	140, 10, 130	100, <10, 125	890, <10, 100	430. 15, 160	140, <10, 160	85, 10, 160	230, <10, 220	270, <10, 70	570, 25, 18	260, 15, 105	55, <10 , 50		65, 10, 44	
	10, <10. 5	14, <10, 16	10, 10, 24	36, 10, 30	38, 10, 3	24, <10. 53	75, <10, 34	120. <10, 155	330, 10 , 120	105, 15, 42	42, <10, 55	186, 15, 145	210, <10, 135	185, <10, 145	260, 25, 125	500, 10, 28	105, 10, 80	230, <10, 80	170, <10, 32		105, 10. 5	

Sn, WO_3, As,
Analyses in p.p.m.

N

40 20 0 50 100m
50 ft

The Shell Company of Australia Limited
METALS DIVISION

E.L. 10/80 GREAT PYRAMID
PINNACLES GRID
SOIL SAMPLE RESULTS
Sn, WO_3, As

SCALE 1: 2000	DATE 6 - 10 - 83
AUTHOR PR	DRAWN JEE
DEVONPORT	
	D/LH01/556

495083

5 cm

150/

2000 W | 1900 W | 1800 W | 1700 W | 1600 W | 1500 W | 1400 W | 1300 W | 1200 W | 1100 W | 1000 W

400 S
- 75, <10, 34
- 90, 15, 34

500 S
- 130, 10, 180
- 16, 20, 120

600 S
- 14, <10, 50
- 12, <10, 12

700 S
- 38, 20, 26
- 10, <10, 12

800 S

900 S

1000 S
- 330, 10, 120
- 75, <10, 32
- 180, <10, 28
- 22, <10, 80
- 22, 10, 38
- 78, <10, 95
- 14, <10, 44
- 6, <10, 14,

1100 S
- 42, <10, 55
- 40, 10, 24
- 140, 15, 75
- 410, 15, 135
- 110, <10, 32
- 210, <10, 55
- 12, 10, 20
- 6, <10, 9

1200 S
- 210, <10, 135
- 770, 10, 920
- 340, 10, 145
- 390, 10, 115
- 100, <10, 150
- 34, <10, 18
- 26, 15, 95

1300 S
- 260, 25, 125
- 185, <10, 300
- 180, <10, 210
- 80, <10, 290
- 90, <10, 85
- 14, 15, 38
- 18, <10, 20

1400 S
- 105, 10, 80
- 90, 15, 125
- 200, 10, 60
- 100, <10, 260
- 40, 10, 60
- 40, 10, 55
- 40, <10, 70

$Sn, WO_3, As,$
Analyses in p.p.m.

N

40 20 0 50 100m
50 30 10

495084

5 cm

The Shell Company of Australia Limited
METALS DIVISION

E.L. 10/80 GREAT PYRAMID
PINNACLES GRID
SOIL SAMPLE RESULTS
$Sn, WO_3, As,$

SCALE	1:2000	DATE	6 - 10 - 83
AUTHOR	P A R	DRAWN	J.L.L.
OFFICE	DEVONPORT	REP No	
ENCL No		PLAN No	D/LH01/557

(52)

1000 W	900 W	800 W	700 W	600 W	500 W	400 W	300 W	200 W	100 W	0E W
22, 12, 110	14, 22, 18	30, 20, 20	20, 28, 28	22, 38, 48	30, 60, 50	22, 42, 48	19, 32, 55	22, 70, 80	22, 60, 6	24, 120, 70
26, 14, 120	4, 34, 8	10, 38, 22	10, 30, 16	26, 60, 38	22, 60, 30	26, 40, 70	24, 49, 90	30, 130, 120	28, 66, 32	80, 250, 170
36, 26, 170	6, 12, 24	14, 44, 70	30, 60, 60	22, 22, 20	24, 42, 28	38, 60, 90	18, 28, 120	16, 46, 26	22, 610, 60	40, 105, 50
44, 38, 95	24, 130, 75	16, 40, 55	36, 40, 75	34, 34, 32	26, 38, 75	34, 60, 180	160, 150, 460	12, 80, 95	14, 55, 36	40, 110, 120
38, 30, 100	18, 28, 65	12, 30, 28	38, 34, 60	42, 70, 310	32, 50, 115	120, 60, 140	110, 140, 200	20, 48, 70	26, 28, 28	70, 125, 160
12, 22, 90	16, 26, 80	30, 28, 50	26, 38, 185	18, 28, 330	70, 60, 170	95, 55, 140	38, 46, 120	18, 24, 40	26, 100, 18	40, 50, 90
16, 20, 120	42, 65, 100	20, 70, 70	65, 48, 260	26, 22, 200	90, 230, 310	80, 60, 230	24, 30, 70	28, 32, 44	30, 22, 36	42, 80, 85
16, 26, 140	110, 50, 150	38, 28, 110	130, 140, 380	70, 50, 230	32, 100, 220	46, 32, 160	32, 50, 100	22, 30, 30	12, 28, 10	32, 100, 38
65, 120, 150	46, 36, 430	18, 80, 600	18, 24, 75	140, 110, 350	34, 140, 110	28, 26, 170	80, 150, 270	22, 48, 32	16, 40, 12	20, 36, 26
12, 110, 110	12, 80, 350	16, 85, 390	28, 44, 120	12, 28, 60	36, 170, 110 / 18, 36, 95	22, 48, 170 / 28, 32, 80	20, 50, 31 / 36, 26 28	60, 60, 150 / 22, 18, 50	38, 26, 40 / 18, 20, 32	36, 90, 90
12, 56, 160	14, 120, 160	22, 24, 120	28, 60, 70	60, 95, 140 / 12, 12, 36	28, 28, 70	10, 14, 24	24, 26, 44	34, 36, 75	42, 42, 66	95, 780, 155
6, 22, 46	4, 16, 32	10, 60, 110	50, 1600, 200	12, 26, 20	38, 24, 60	16, 18, 28	44, 42, 100	18, 50, 44	60, 250, 200	160, 1050, 90
14, 48, 110	6, 18, 55	4, <4, 20	90, 270, 175	28, 32, 110	40, 34, 46	55, 38, 42	20, 48, 34	14, 20, 70	300, 300, 80	80, 110, 80
30, 60, 290	26, 42, 220	10, 16, 90	26, 39, 110	100, 230, 165	28, 34, 50	22, 24, 28	10, 10, 12	14, 28, 95	280, 180, 130	28, 100, 60
12, 14, 130	70, 300, 470	10, 20, 55	28, 44, 100	60, 70, 155	22, 24, 14	24, 18, 30	16, 18, 48	12, 26, 34	75, 70, 170	42, 46, 36
12, 14, 90	16, 30, 150	6, 18, 55	12, 32, 65	60, 30, 130	36, 40, 85	24, 20, 60	8, 16, 10	20, 28, 48	75, 36, 160	30, 34, 36
12, 6, 76	4, <4, 16	4, <4, 38	18, 20, 135	32, 32, 150	32, 46, 38	16, 18, 32	14, 12, 44	34, 12, 75	55, 36, 120	36, 60, 100
12, 6, 36	8, 6, 38	18, 8, 65	12, 14, 70	32, 50, 120	16, 32, 38	20, 24, 18	55, 28, 70	76, 10, 160	66, 30, 60	32, 32, 95
60, 38, 110	6, 4, 50	4, <4, 22	4, <4, 18	18, 26, 60	8, 10, 12	20, 20, 20	200, 12, 165	36, 10, 65	16, 18, 32	12, 18, 20
60, 18, 46	14, 16, 70	10, 8, 34	8, <4, 30	10, 10, 28	14, 24, 30	38, 16, 42	30, 26, 110	18, 8, 48	14, 24, 26	16, 34, 20
60, 40, 48	12, 20, 60	8, <4, 28	30, 18, 100	32, 24, 90	66, 36, 60	60, 16, 42	70, 24, 90	22, 16, 60	22, 30, 24	28, 32, 60

Cu, Pb, Zn
Analyses in p.p.m.

N

40 20 0 50 100m
50 30 10

The Shell Company of Australia Limited
METALS DIVISION

E.L. 10/80 GREAT PYRAMID
PINNACLES GRID
SOIL SAMPLE RESULTS
Cu, Pb, Zn.

SCALE	1:2000	DATE	6 - 10 - 83
AUTHOR	P.R.	DRAWN	J.L.L.
OFFICE	DEVONPORT	REF. NO.	
ENCL.		DWG. NO.	D/LH01/558

495085

5 cm

1501

W 2000 | W 1900 | W 1800 | W 1700 | W 1600 | W 1500 | W 1400 | W 1300 | W 1200 | W 1100 | W 1000

400 S

500 S

600 S

700 S

800 S

900 S

1000 S

1100 S

1200 S

1300 S

1400 S

30, 22, 26
115, 34, 50
140, 22, 60
140, 150, 60
70, 42, 24
60, 80, 26
34, 20, 50
34, 30

100, 26, 55
40, 30, 70
38, 16, 36
790, 340, 100
120, 16, 30
115, 75, 80
42, 30, 50
30, 34

34, 20, 75
18, 10, 30
80, 14, 55
80, 16, 90
50, 14, 50
55, 18, 44
26, 24, 42
24, 18

60, 75, 170
220, 250, 180
65, 44, 70
70, 42, 60
80, 80, 120
20, 34, 60
50, 30, 30

80, 70, 100
170, 320, 180
110, 90, 180
80, 120, 140
28, 16, 60
14, 14, 36
8, 10, 28

60, 95, 190
115, 42, 105
30, 32, 80
126, 65, 110
24, 24, 50
26, 12, 70
16, 36, 34

Cu, Pb, Zn
Analyses in p.p.m.

N

40 20 0 50 100 m
50 30 10

5 cm

495086

The Shell Company of Australia Limited
METALS DIVISION

E.L. 10/80 GREAT PYRAMID
PINNACLES GRID
SOIL SAMPLE RESULTS
Cu, Pb, Zn

SCALE 1:2000	DATE 7 - 10 - 83
AUTHOR P.A.R	DRAWN J.L.L
OFFICE DEVONPORT	REP. No.
ENCL. No.	DRG. No. D/LH01/559

/501/

2000 W | 1500 W | 1000 W

600 N
500 N
400 N
300 N
200 N
100 N
0
100 S
200 S
300 S
400 S

90,38,22 | 100,14,26 | 42,6,16 | 60,10,16 | 12,8,20 | 30,8,18 | 18,14,38 | 60,6,32 | 26,8,28 | 80,10,32 | 46,10,30 | 50,28,65 | 18,16,24 | 38,22,50 | 18,16,130 | 22,12,110
20,12,16 | 200,18,30 | 38,4,18 | 42,10,12 | 18,6,16 | 50,2,20 | 12,<4,16 | 55,6,36 | 22,4,26 | 55,4,22 | 60,18,56 | 230,16,65 | 40,14,40 | 42,16,100 | 14,16,65 | 26,14,120
40,16,22 | 40,14,30 | 200,12,20 | 60,10,12 | 260,8,22 | 38,14,20 | 48,8,24 | 16,6,26 | 60,8,36 | 110,18,55 | 60,32,85 | 120,26,65 | 46,12,50 | 65,16,170 | 16,18,65 | 36,26,170
110,24,16 | 44,12,14 | 32,20,20 | 14,30,14 | 14,26,12 | 100,32,80 | 28,22,44 | 165,20,42 | 90,12,70 | 96,10,65 | 130,16,90 | 80,6,60 | 60,8,100 | 55,14,130 | 60,20,180 | 100,34,190 | 38,12,120 | 40,30,90 | 60,22,105 | 44,38,95
32,10,14 | 70,12,16 | 24,4,14 | 85,14,16 | 36,10,16 | 28,6,18 | 36,6,22 | 76,14,70 | 30,10,42 | 65,6,55 | 48,14,65 | 36,12,70 | 65,18,175 | 100,30,160 | 30,10,100 | 42,20,130 | 30,16,90 | 26,34,36 | 18,18,80 | 38,30,100
22,6,14 | 22,<4,18 | 65,10,20 | 34,10,20 | 22,4,24 | 30,8,26 | 16,24,46 | 18,10,26 | 16,10,42 | 22,6,42 | 42,16,75 | 30,34,80 | 60,22,150 | 75,26,120 | 70,70,200 | 75,40,95 | 80,28,160 | 40,46,140 | 24,22,75 | 12,22,90
16,<4,8 | 12,<4,10 | 70,4,14 | 14,12,18 | 32,18,30 | 22,10,14 | 8,8,65 | 14,8,32 | 8,8,42 | 6,<4,24 | 8,16,44, | 20,36,60 | 14,18,100 | 40,36,120 | 80,120,240 | 48,165,220 | 34,60,80 | 12,24,55 | 8,10,96 | 16,20,120
42,4,18 | 60,8,24 | 16,4,16 | 12,8,24 | 10,<4,22 | 20,8,12 | 8,14,90 | 18,14,28 | 10,8,50 | 8,4,18 | 12,18,80 | 8,16,130 | 10,32,130 | 20,60,65 | 28,100,175 | 48,95,250 | 12,30,90 | 10,65,75 | 20,26,150 | 16,26,140
170,20,34 | 60,12,20 | 32,8,34 | 30,12,18 | 24,10,22 | 14,10,10 | 20,10,20 | 16,10,34 | 16,8,34 | 18,16,40 | 12,16,42 | 10,20,38 | 8,18,34 | 12,65,85 | 8,160,20 | 48,270,220 | 24,130,160 | 14,120,56 | 16,280,140 | 24,90,110 | 65,120,150
160,14,38 | 150,14,24 | 85,12,22 | 75,34,26 | 22,12,6 | 16,14,10 | 26,10,14 | 85,24,44 | 42,12,36 | 18,10,50 | 40,28,85 | 14,34,70 | 16,12,75 | 8,24,28 | 6,20,16 | 12,530,85 | 18,200,50 | 8,80,50 | 10,120,110 | 26,150,156 | 12,110,110
130,14,38 | 180,20,30 | 140,16,50 | 180,20,24 | 30,16,8 | 24,10,16 | 16,14,20 | 34,16,34 | 150,20,60 | 46,16,44 | 26,24,190 | 40,10,110 | 20,75,60 | 12,105,24 | 8,80,24 | 32,140,12 | 34,120,100 | 16,60,65 | 10,98,75 | 20,75,110 | 12,55,160
185,14,24 | 100,14,28 | 130,12,32 | 160,12,26 | 28,20,6 | 40,12,42 | 100,70,65 | 48,14,40 | 80,16,90 | 90,24,65 | 150,55,160 | 34,60,120 | 14,26,55 | 16,120,20 | 24,330,48 | 10,70,70 | 22,70,75 | 22,18 70 | 16,34,90 | 6,22,46
50,12,14 | 90,20,24 | 40,14,32 | 38,12,18 | 80,20,42 | 70,16,38 | 44,20,30 | 180,28,195 | 180,12,50 | 70,36,240 | 28,30,76 | 10,36,50 | 14,18,20 | 10,180,28 | 38,280,70 | 70,530,130 | 32,66,80 | 24,38,70 | 12,20,38 | 14,48,110
80,12,20 | 48,12,14 | 85,6,22 | 28,12,20 | 95,22,36 | 42,16,42 | 75,18,36 | 120,22,55 | 40,6,50 | 220,28,140 | 46,10,65 | 34,30,30 | 38,48,24 | 6,60,20 | 22,130,65 | 28,140,100 | 38,85,85 | 24,48,85 | 18,30,60 | 30,60,290
65,14,34 | 36,10,20 | 28,<4,18 | 40,8,18 | 80,18,34 | 115,22,60 | 85,20,44 | 48,20,70 | 110,18,75 | 60,16,60 | 90,14,48 | 20,18,38 | 55,26,85 | 22,160,36 | 26,46,30 | 26,48,50 | 44,65,100 | 181,48,95 | 22,38,80 | 12,14,130
140,28,50 | 120,12,26 | 60,18,26 | 20,12,18 | 130,16,30 | 160,18,38 | 180,24,60 | 36,22,60 | 48,14,70 | 36,42,48 | 55,26,75 | 30,40,80 | 42,22,70 | 36,40,70 | 22,85,95 | 55,430,110 | 36,75,90 | 60,70,220 | 14,10,66 | 12,14,90
165,70,170 | 70,16,42 | 44,18,32 | 60,36,55 | 85,26,36 | 140,20,70 | 50,22,70 | 26,12,46 | 75,16,48 | 14,28,38 | 16,6,30 | 28,22,120 | 26,20,42 | 16,120,30 | 38,60,80 | 12,22,50 | 24,32,38 | 34,60,90 | 20,22,85 | 12,6,75
60,38,80 | 50,22,40 | 46,10,90 | 46,30,70 | 85,40,75 | 30,38,125 | 120,20,110 | 48,48,60 | 30,30,120 | 16,14,28 | 44,8,36 | 16,10,60 | 40,44,65 | 22,60,70 | 48,65,80 | 12,18,28 | 18,12,18 | 28,16,34 | 34,46,150 | 12,6,36
30,24,90 | 42,92,90 | 30,34,110 | 50,24,100 | 30,18,55 | 140,60,115 | 50,24,85 | 32,8,32, | 85,18,26 | 150,85,170 | 16,14,75 | 34,24,80 | 30,65,48 | 32,80,110 | 110,70,75 | 24,22,32 | 20,40,44 | 24,100,60 | 40,22,100 | 60,38,110
34,20,60 | 22,76,26 | 24,26,65 | 30,18,70 | 66,24,70 | 20,34,80 | 55,72,75 | 18,22,110 | 34,22,100 | 32,26,50 | 60,95,70 | 40,36,100 | 70,120,230 | 80,160,230 | 140,110,150 | 18,60,65 | 16,38,75 | 60,250,165 | 80,80,150 | 60,18,96
36,20,32 | 48,34,26 | 70,14,48 | 48,48,180 | 42,60,55 | 70,36,80 | 30,22,26 | 1500,44,70 | 100,26,55 | 48,34,120 | 34,20,75 | 24,12,130 | 60,75,170 | 24,100,130 | 80,70,100 | 18,18,30 | 60,95,120 | 30,180,110 | 100,65,95 | 60,40,48

Cu , Pb , Zn
Analyses in p.p.m.

N

40 20 0 50 100m
50 30 10

The Shell Company of Australia Limited
METALS DIVISION

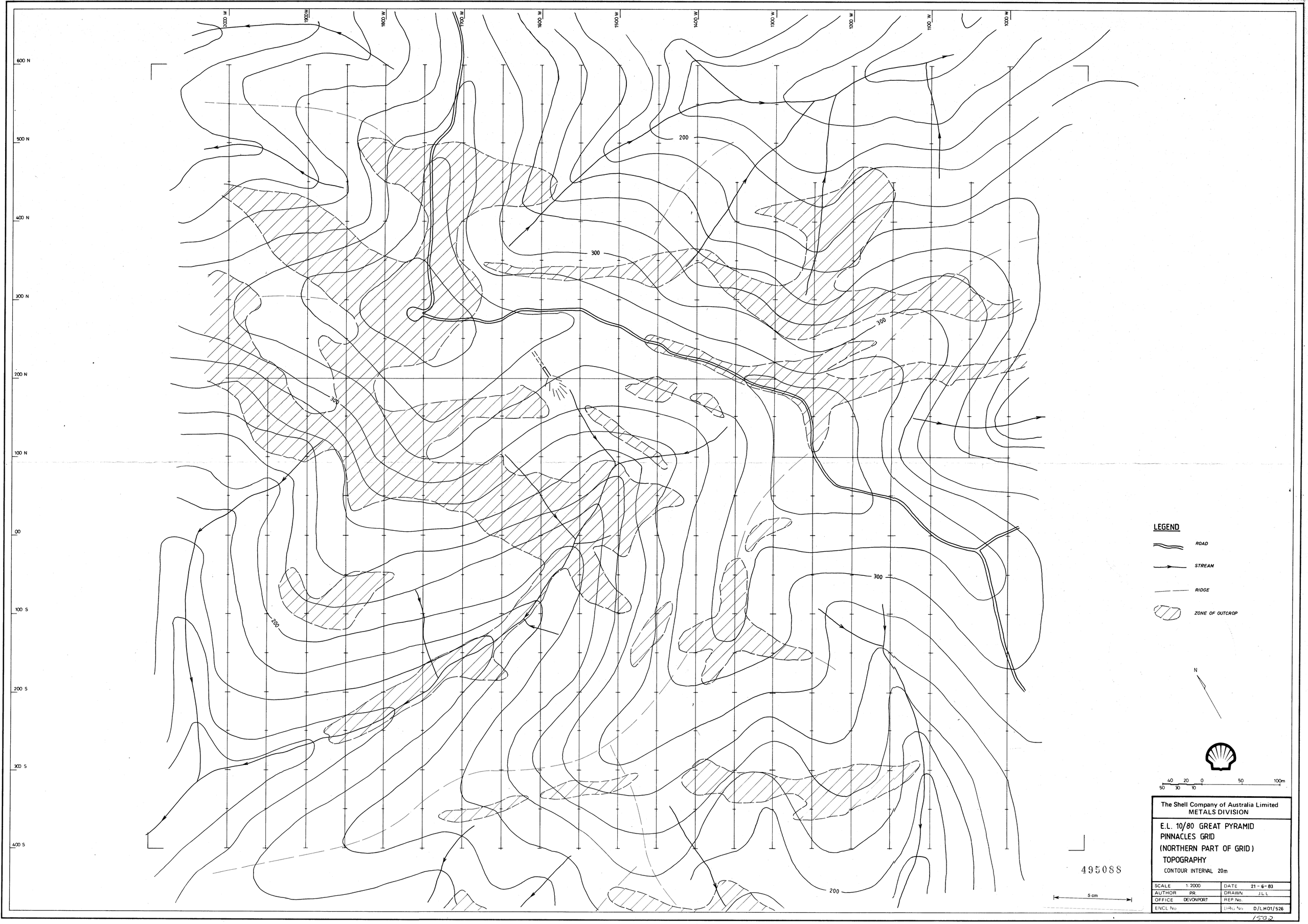
E.L. 10/80 GREAT PYRAMID
PINNACLES GRID
SOIL SAMPLE RESULTS
Cu , Pb , Zn

SCALE	1:2000	DATE	7-10-83
AUTHOR	PR	DRAWN	JLL
OFFICE	DEVONPORT	REP No.	
ENCL No.		DRG No.	D/LH01/560

495087

5 cm

(533)



LEGEND

- ROAD
- STREAM
- RIDGE
- ZONE OF OUTCROP

N

40 20 0 50 100m
50 30 10

5 cm

495088

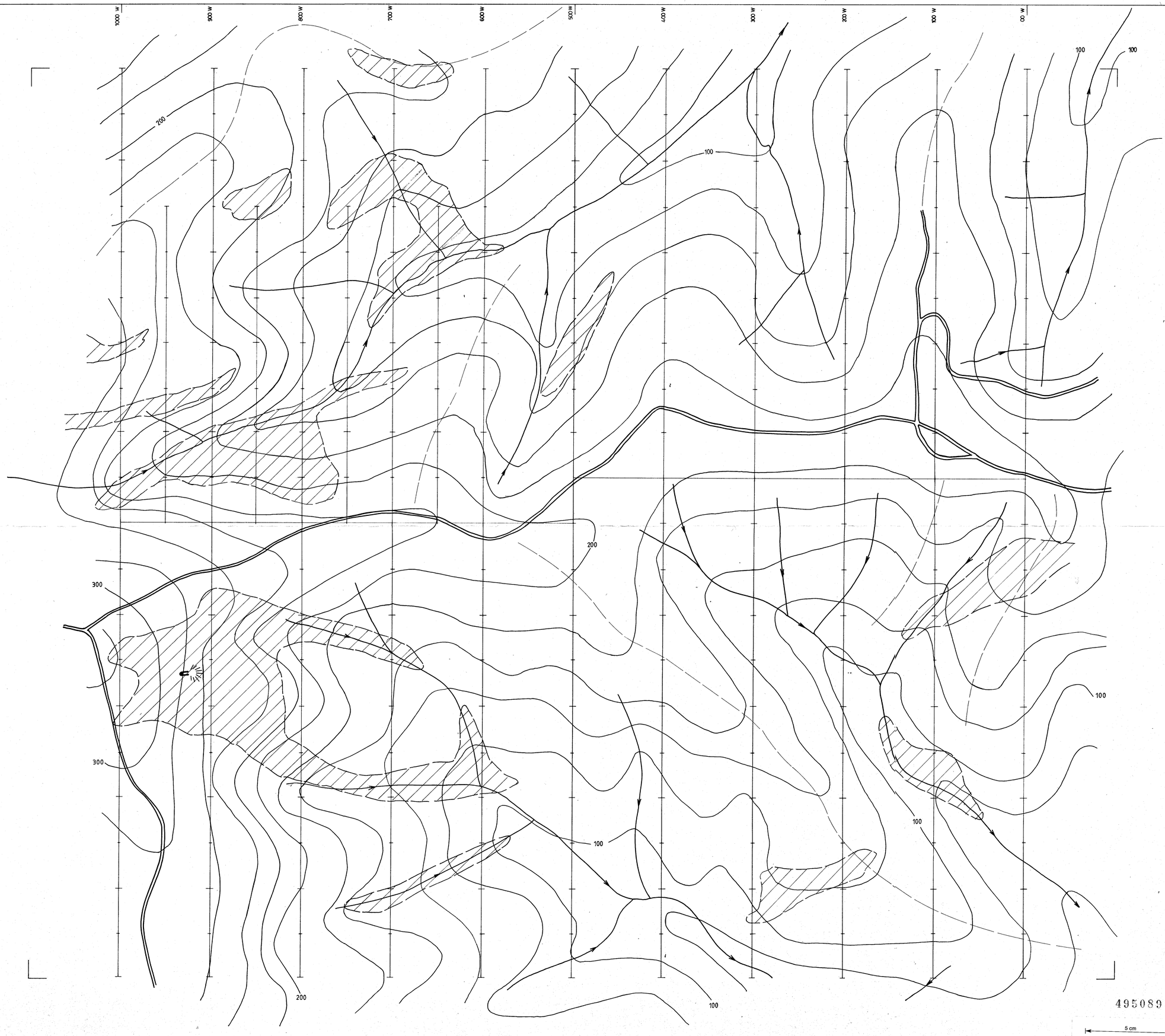
The Shell Company of Australia Limited
METALS DIVISION

E.L. 10/80 GREAT PYRAMID
PINNACLES GRID
(NORTHERN PART OF GRID)
TOPOGRAPHY

CONTOUR INTERVAL 20m

SCALE	1:2000	DATE	21-6-83
AUTHOR	PR	DRAWN	J.L.L
OFFICE	DEVONPORT	REP. No.	
ENCL No.		DRG No.	D/LH01/526

1502



495089

The Shell Company of Australia Limited
METALS DIVISION

E.L. 10/80 GREAT PYRAMID
PINNACLES GRID
(EASTERN PART OF GRID)
TOPOGRAPHY
CONTOUR INTERVAL 20 m

SCALE	1:2000	DATE	7-4-83
AUTHOR	P.R.	DRAWN	J.L.L.
OFFICE	DEVONPORT	REP. No.	
ENCL. No.		DRG No.	D/LH01/528

1502



LEGEND

ROAD

STREAM

RIDGE

ZONE OF OUTCROP

N

40 20 0 50 100m
50 30 10

495090

5 cm

The Shell Company of Australia Limited
METALS DIVISION

E.L. 10/80 GREAT PYRAMID
PINNACLES GRID
(SOUTHERN PART OF GRID)
TOPOGRAPHY
CONTOUR INTERVAL 20m

SCALE	1:2000	DATE	22-6-83
AUTHOR	P.A.R.	DRAWN	J.L.L.
OFFICE	DEVONPORT	REP. No.	
ENCL. No.		DRG. No.	D/LH01/527

2000 W 1900 W 1800 W 1700 W 1600 W 1500 W 1400 W 1300 W 1200 W 1100 W 1000 W

600 N 500 N 400 N 300 N 200 N 100 N 00 100 S 200 S 300 S 400 S

SHAFT

ADIT

BOUDINS

spotted

spotted sst

faint spotting

black shales

LEGEND

- BEDDING
- OVERTURNED BEDDING
- CLEAVAGE
- YOUNGING
- FOLD AXIS AND PLUNGE (32°)
- DOMINANTLY SANDSTONE
- S S DOMINANTLY SHALES
- S SHALES / SILTSTONES

50 30 10 40 20 0 50 100m

5 cm

495091

The Shell Company of Australia Limited
METALS DIVISION

E.L. 10/80 GREAT PYRAMID
PINNACLES GRID
LITHOLOGY AND STRUCTURE PLAN

SCALE	1:2000	DATE	22-6-83
AUTHOR	P.A.R.	DRAWN	J.L.L.
OFFICE	DEVONPORT	REP.No.	
ENCL No.		DRG No.	D/LH01/561

1502

1000 W 900 W 800 W 700 W 600 W 500 W 400 W 300 W 200 W 100 W 0

600 N 500 N 400 N 300 N 200 N 100 N 0 100 S 200 S 300 S 400 S

spotted

spotted

ADIT

trench

spotted
2000 cgs. × 10^{-6} units.

495092

5 cm

LEGEND

- BEDDING
- VERTICAL BEDDING
- CLEAVAGE
- FOLD AXIS AND PLUNGE
- DOMINANTLY SANDSTONE
- S S S DOMINANTLY SHALES
- SHALES / SILTSTONES

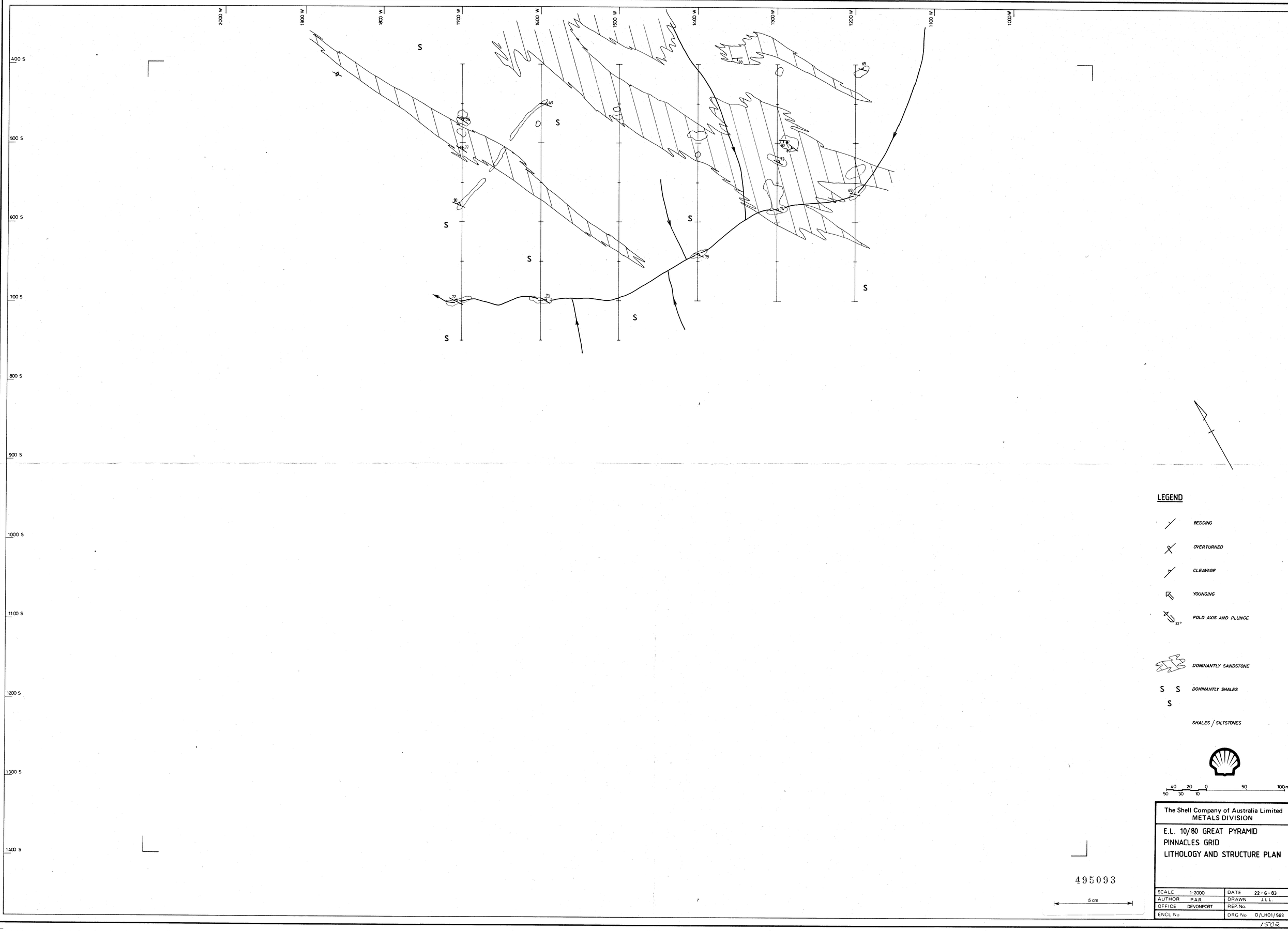
40 20 0 50 100m
50 30 10

The Shell Company of Australia Limited
METALS DIVISION

E.L. 10/80 GREAT PYRAMID
PINNACLES GRID
LITHOLOGY AND STRUCTURE PLAN

SCALE	1:2000	DATE	7-10-83
AUTHOR	P.R.	DRAWN	J.L.L.
OFFICE	DEVONPORT	REP. No.	
ENCL No.		DRG No.	D/LH01/562

1502



LEGEND

- BEDDING
- OVERTURNED
- CLEAVAGE
- YOUNGING
- 32° FOLD AXIS AND PLUNGE
- DOMINANTLY SANDSTONE
- S S DOMINANTLY SHALES
- S SHALES / SILTSTONES

40 20 0 50 100m
50 30 10

The Shell Company of Australia Limited
METALS DIVISION

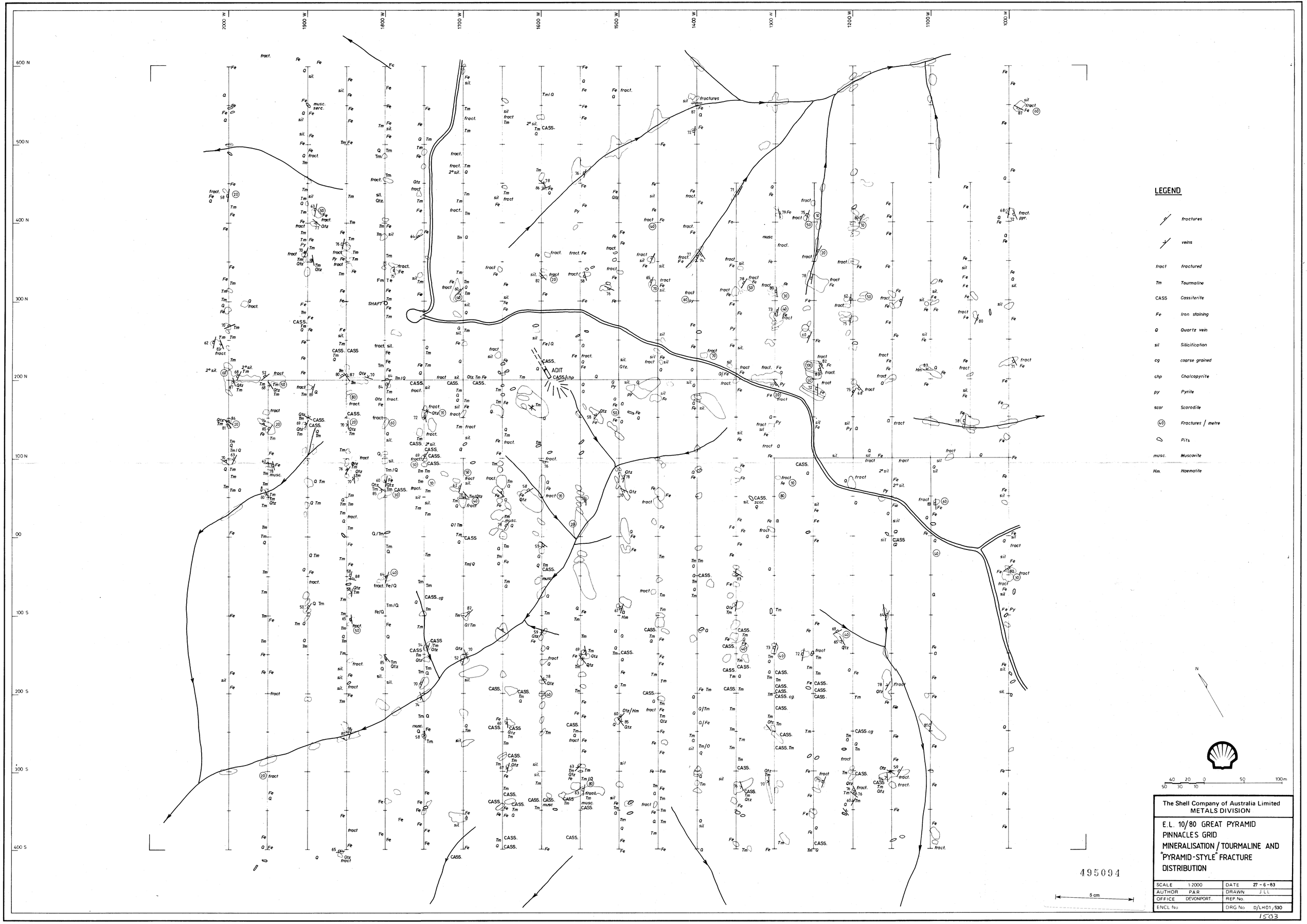
E.L. 10/80 GREAT PYRAMID
PINNACLES GRID
LITHOLOGY AND STRUCTURE PLAN

SCALE	1:2000	DATE	22-6-83
AUTHOR	P.A.R.	DRAWN	J.L.L.
OFFICE	DEVONPORT	REP.No.	
ENCL No		DRG No	D/LH01/563

1502

495093

5 cm



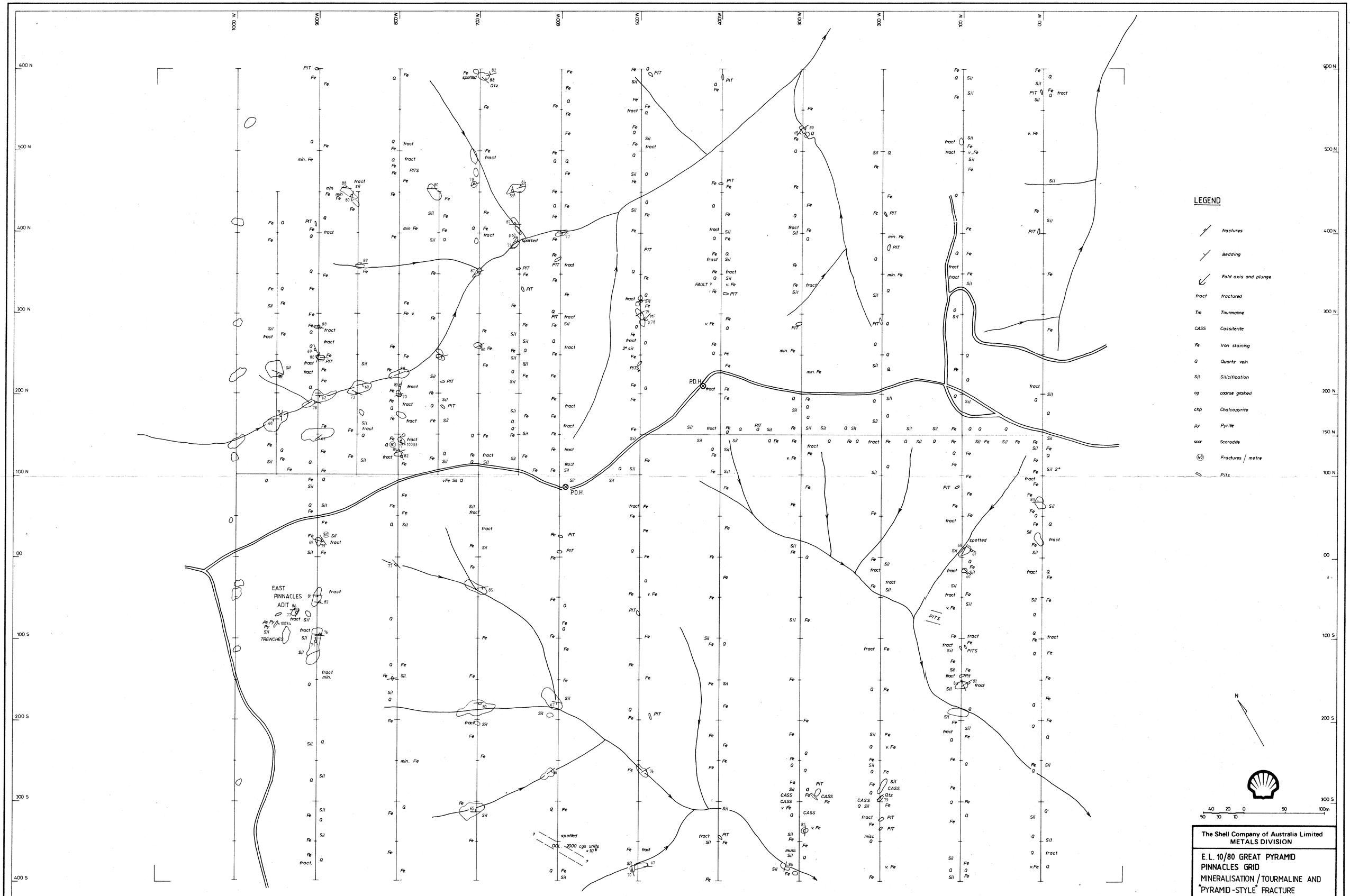
495094

The Shell Company of Australia Limited
METALS DIVISION

E.L. 10/80 GREAT PYRAMID
PINNACLES GRID
MINERALISATION / TOURMALINE AND
"PYRAMID-STYLE" FRACTURE
DISTRIBUTION

SCALE	1:2000	DATE	27 - 6 - 83
AUTHOR	P.A.R.	DRAWN	J.L.L.
OFFICE	DEVONPORT	REP. No.	
ENCL No		DRG No.	D/LH01/530

1503



495095

The Shell Company of Australia Limited
METALS DIVISION

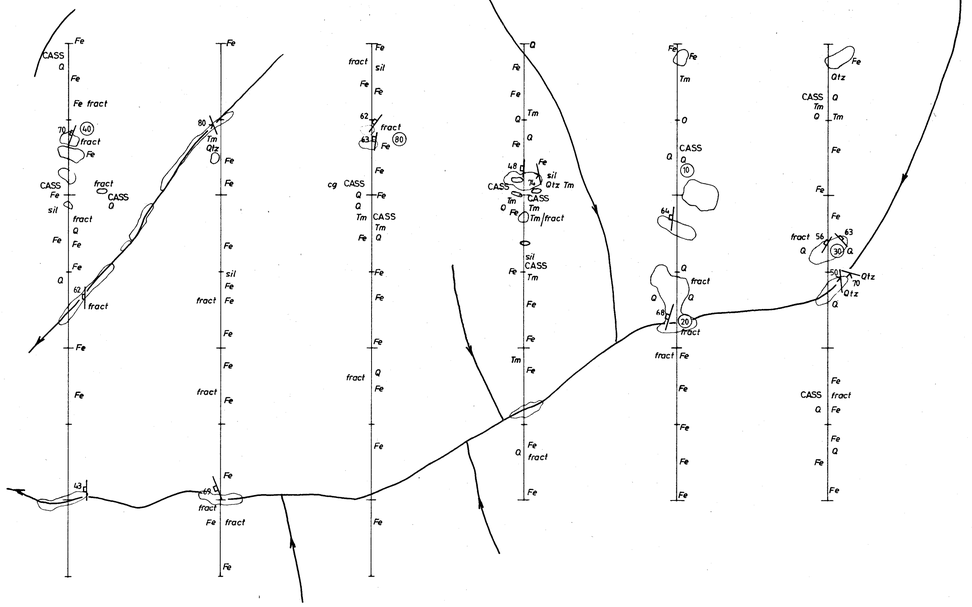
E.L. 10/80 GREAT PYRAMID
PINNACLES GRID
MINERALISATION / TOURMALINE AND "PYRAMID-STYLE" FRACTURE DISTRIBUTION

SCALE	1:2000	DATE	10-10-83
AUTHOR	P.R.	DRAWN	J.L.L.
OFFICE	DEVONPORT	REP. No.	
ENCL No.		DRG No.	D/LH01/564

1503

2000 W 1900 W 1800 W 1700 W 1600 W 1500 W 1400 W 1300 W 1200 W 1100 W 1000 W

400 S
500 S
600 S
700 S
800 S
900 S
1000 S
1100 S
1200 S
1300 S
1400 S



LEGEND

	fractures
	veins
fract	fractured
Tm	Tourmaline
CASS	Cassiterite
Fe	Iron staining
Q	Quartz vein
sil	Silicification
cg	coarse grained
chp	Chalcopyrite
py	Pyrite
scor	Scorodite
(40)	Fractures / metre
	Pits
musc.	Muscovite
Hm.	Haematite

N

40 20 0 50 100m
50 30 10

The Shell Company of Australia Limited
METALS DIVISION

E.L. 10/80 GREAT PYRAMID
PINNACLES GRID
MINERALISATION / TOURMALINE AND
"PYRAMID-STYLE" FRACTURE
DISTRIBUTION

SCALE	1:2000	DATE	27-6-83
AUTHOR	P.A.R.	DRAWN	J.L.L.
OFFICE	DEVONPORT	REP.No.	
ENCL No.		DRG No	D/LH01/529

495096

1503