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GEOPEKO

A DIVISION OF PEKO-WALLSEND OPERATIONS LIMITED

ELLIOTT BAY AREA - TASMANIA

PROGRESS REPORT EXPLORATION LICENCE 27/76.

VOYAGER 2 PROSPECT

MICROFILMED

by

C.D. STRICKLAND and W. HERRMANN

OPEN FILE

DEVONPORT, TASMANIA MAY 1980

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SUMMARY

Exploration Licence 27/76 is currently held by Geopeko, a Division of Peko-Wallsend Operations Limited and occupies a total area of 329 square kilometres.

This report details the nature and results of a six hole diamond drilling programme carried out during the 1978-79 and 1979-80 summer field seasons at the Voyager 2 prospect. During the 1978-79 season five shallow AQ holes were drilled into selected geochemical and geophysical targets. The 1979-80 programme consisted of drilling a single deeper NQ-BQ hole to further investigate the anomalous Pb geochemistry encountered in Voyager 2 D.D.H. 1.

INTRODUCTION

Exploration Licence 27/76 is currently held by Geopeko and occupies an area of 329 square kilometres in the land district of Montgomery, south west Tasmania. (See Fig 1).

Reconnaissance and prospect evaluation at Voyager 2 (Lewis River Prospect) was first carried out by Geopeko during the 1976-77 and 1977-78 summer seasons. That evaluation is fully reported in STRICKLAND C.D. 1978.

This report reviews the diamond drilling programme carried out during the 1978-79 and 1979-80 seasons at Voyager 2 (See Fig No 2). The results and onward proposals generated from the drilling evaluation are presented and discussed within this report.

The 1978-79 exploration programme consisted of:

a) Diamond Drilling

Voyager 2/1	2.5m	-	33.0m
Voyager 2/2	1.4m	-	47.0m
Voyager 2/3	0.8m	-	42.0m
Voyager 2/4	0.2m	-	30.7m
Voyager 2/5	0.2m	-	54.75m

b) Geological and geochemical evaluation of drill core.

The 1979-80 exploration programme consistent of:

a) Diamond Drilling

Voyager 2/6	4.30m	-	200.35m

b) Geological and geochemical evaluation of drill core.

c) Reporting.

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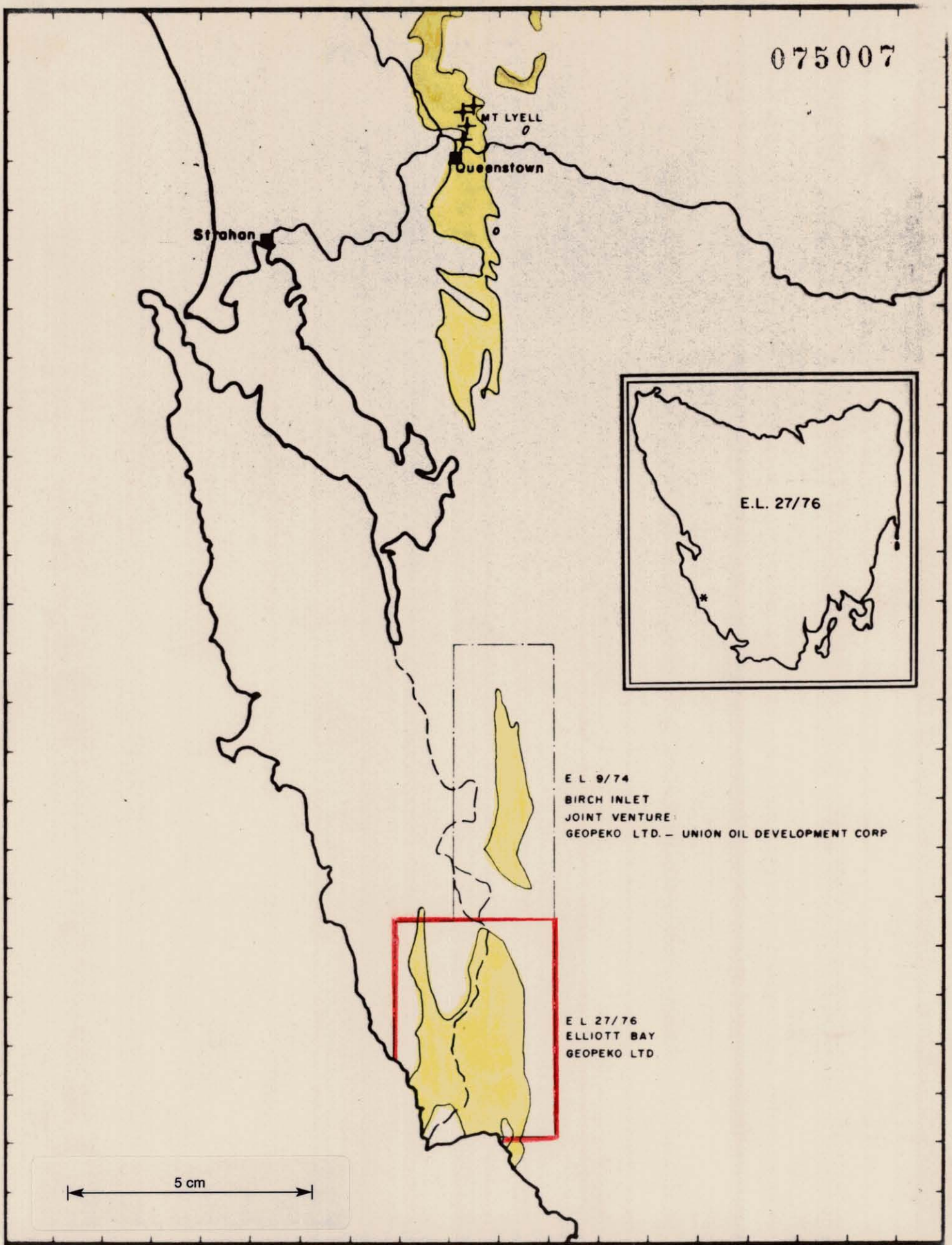

LEGEND

- Significant Basemetal Mineralization
- Mt Read Acid Volcanics
- Road
- Track

DATE 18-4-78
GEOL C D S
DWN J P M.
CHKD CDS.

GEOPEKO LIMITED
KING ISLAND

Scale 1 500 000

Fig No. 1

LOCATION MAP

E.L. 27/76

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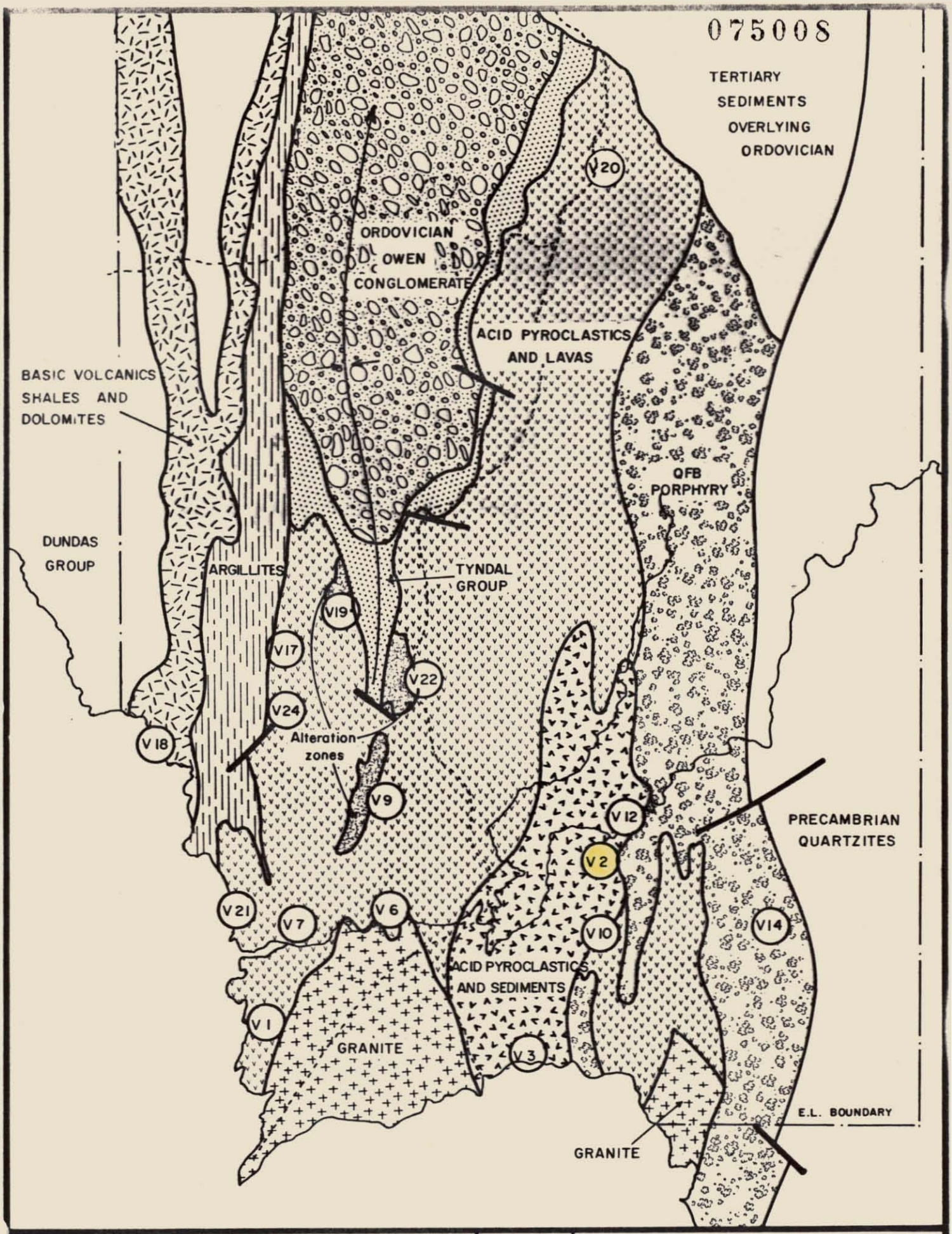

LEGEND

(V10) Location of Voyager 10 prospect.

5 cm

DATE:
GEOL:
DWN:
CHKD:

GEOPEKO

SCALE: 1:100 000

Fig. 2

ELLIOTT BAY
E.L. 27/76

PROSPECT LOCATION MAP

CONCLUSIONS

1. The broad north-south trending suite of sediments and tuffs which contains the Voyager 2 prospect has been shown to be anomalous in Cu, Pb and Zn. This lithological horizon is very similar to the Voyager 3 environment and both zones may be continuous although hidden in part by Tertiary deposits.

2. C-horizon geochemical auger sampling and shallow diamond drill testing of geochemical and geophysical anomalies have shown the presenece of minor eratic lenses of Cu, Pb and Zn mineralization. A more significant intersection of galena and sphalerite has been located in D.D.H. No's 1 and 6.

3. The major Pb-Zn geochemical anomaly is open to the north and justifies additional evaluation north of the Lewis River to the west of Voyager 12.

RECOMMENDATIONS

1. Extend the Voyager 2 grid north across the Lewis River with cross traverses spaced at 200 metre intervals, provision should be made for 100 metre spaced in-fill traverses dependant upon survey results.

2. Carry out power or hand auger geochemistry, Dipole-Dipole I.P. and geological mapping in order to trace along strike the Pb-Zn zone encountered in D.D.H. Nô 1+6.

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ACTION SHEET

GEOLOGY

Based upon the recommendations outlined by Strickland, C.D., 1978, a diamond drilling programme involving 5 holes was implemented to enable the subsurface investigation of the following targets:

Voyager 2, D.D.H. 1 - 10 200N, 10030E
- coincident I.P. anomaly - Pb geochemical anomaly.

Voyager 2, D.D.H. 2 - 10 000N, 9815E
- Cu-Pb geochemical anomaly.

Voyager 2, D.D.H. 3 - 10 000N, 10 175E
- coincident I.P., V.L.F. (EM) - Pb geochemical anomaly.

Voyager 2, D.D.H. 4 - 9 630N, 10 000E
- coincident I.P. anomaly - Cu geochemical anomaly.

Voyager 2, D.D.H. 5 - 10 050N, 9 935E
- evaluate the Lewis River Prospect lode at depth.

The geological and geochemical evaluation of the Voyager 2 Prospect is described in detail in Strickland, C.D., 1978, and an updated geological interpretation at 1:5000 scale is presented on Sheet KT 27/76 V2-2 in the folder of this report. A detail summary of the geophysics carried out over the Voyager 2 prospect is presented in Mudge, S.T., 1978.

The Voyager 2 prospect consists of a complex unit of dominantly vitric tuff pyroclastics intercalated with both crystal tuff and rarer lithic tuff varieties. Present

also are volcaniclastic sediments (siltstones, shales and greywackes) representing well reworked tuffs. From the geological logs it can be seen that zones previously mapped as vitric tuffs at the surface have been more accurately examined in drill core and the resulting volcaniclastic sediment suite is considerably more widespread than originally defined.

The host rocks are very similiar to those encountered in the Voyager 3 area along the coastal section of Elliott Bay, in fact airphoto interpretation suggests that this belt of volcano-sedimentary lithologies may be a regional unit within E.L. 27/76.

The Voyager 2 prospect is a known example of sulphide mineralization within the Lewis River volcanics. The visible mineralization occurs patchily over a strike length of approximately 400m and varies from 5cm-2 metres in width. Two small shafts and a costean are evidence of historical activity on the widest and most consistent portion of the occurrence which strikes approximately 140° and dips to the west between 45-60°.

At the site of the old workings (Lewis River Prospect) the vein like deposit has a typical gossanous outcrop and consists of dark yellow-brown siderite, black manganese oxides and white quartz, the latter often the dominating gangue mineral. Within this assemblage occurs blebs and stringers of pyrite, chalcopyrite and rare sphalerite. Sulphides are very scarce in the quartz dominated portions of the deposit. The contacts with the surrounding fine grained host rocks are sharp and no obvious alteration features are visible in the pale tuffs.

Rare pyrite cubes were the only sulphide mineralization visible in the surrounding host lithologies and occured within the hanging wall.

Following a brief re-evaluation of the Voyager 2 I.P. data it was recommended during the October 1979 Technical Meeting to follow up the anomalous pb geochemistry in Voyager 2 D.D.H.1 with a second deeper hole.

Voyager 2, D.D.H. 6 10202.8mN, 9921.6mE.

This hole was commenced on the 6-2-1980 and having experienced severe broken ground condition was completed at 200.35m on the 14-3-1980.

DIAMOND DRILLING

a) (1978-79)

Prospect diamond drilling was undertaken by Geopeko utilizing a converted Jacro 200-27 hydraulic rig mounted on and powered by a Muskeg Tractor Bombardier. Pre collaring with 3 inch diameter auger proved unsatisfactory allowing serious collar deviation to occur, so diamond drilling from the surface was adopted as the standard technique wherever possible. Diamond drilling was carried out using AQ wireline equipment and impregnated bits. A portable water pump and up to 600 metres of lay-flat hose provided lubricating and cooling water for the drilling, the water sources varying from small creeks to sea water as available. An auxiliary water tank mounted on the side of the Bombardier provides a limited on site storage facility.

The versatile rig has a maximum AQ capacity of 90m, however core recoveries in soft volcano-sedimentary lithologies are barely acceptable and a severe lack of solid core is reflected in the geological interpretation of the drill holes.

b) (1979-80)

A trailer-skid mounted F30 drilling rig was prepared by Geopeko for the planned 200m drill hole at the Voyager 2 prospect. This rig and supporting equipment was transported on a Bombardier carrier from Birch Inlet to the drill site. Drilling and transportation were undertaken by Geopeko.

Drilling both in NQ and BQ core sizes experienced difficult conditions and broken ground together with short runs plagued the hole from 4.30m - 200.35m.

A small portable water pump (Honda) in conjunction with several hundred metres of lay flat hose provided a water supply from a local creek to the rig. High pressure down the hole water was supplied via a Jim Bean, Triplex mud pump. Rotrol mud-additives were used throughout for flushing of broken rock fragments from the drill hole.

Refer to Appendices 1 - 6 for details of the drill hole logs.

DISCUSSION OF RESULTS

1. Voyager 2 D.D.H. 1 and D.D.H. 6 have indicated anomalous galena and sphalerite mineralization within the fine grained sediments and tuffs of the northern section of the Voyager 2 grid. Hole 1 experienced severe core loss throughout the length of the hole with recoveries averaging less than 50%. The geochemical evaluation of the core is therefore suspect however an indication of the anomalous Pb and Zn character is obvious. Between 8.0-33.0m the average sample value for Pb and Zn is 0·32% and 221ppm respectively. Weakly anomalous Cu is present in the upper 12 metres of the hole with a maximum value of 210ppm between 9-10 metres. Hole 6 was planned to further test this geochemically anomalous zone following a re-evaluation of the 1977-78 I.P. survey data. Additional Dipole-Dipole I.P. was attempted during 1979-80 utilizing frequency domain equipment. This survey was to further define the original I.P. anomaly on line 10200N prior to the drilling of hole 6. However the I.P. survey had to be abandoned due to equipment breakdowns. This hole, inclined at -51° to the east was designed to intersect the down dip extension of the anomalous Pb geochemistry and coincident I.P. anomaly zone. A westerly dip of 60° was assumed for the mineralization and a depth to target of between 150-180 metres. The hole intersected a westerly dipping sequence of fine to medium grained, rhyolitic crystal and crystal-vitric tuffs and fine grained tuffaceous siltstones and greywackes. A shear zone was encountered between approximately 57.25m - 63.40m.

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The mineralization in the core above the shear zone is restricted to minor euhedral disseminated pyrite and rare pyrite-chalcopyrite associated with pale straw coloured carbonate (siderite)? in fine veinlets and small fractures.
Below the shear galena-sphalerite mineralization occurs in association with pyrite and rare chalcopyrite in small crosscutting veinlets which occur with irregular frequency and are usually less than 1mm wide. Fine, almost microscopic disseminated galena-sphalerite mineralization is present throughout the length of the hole but is very subordinate to the veinlet mineralization. Pb-Zn mineralization persists to the end of the hole although a barren zone occurs between 181-195m. The 9m zone between 135m-144m contains the most concentrated mineralization averaging 1.61% Pb, 0.24% Zn and 21.2 g/t Ag. The maximum Pb and Zn values recorded are 2.96% and 0.84% respectively. Cu values were low throughout with only several samples in excess of 200ppm, a maximum value of 480ppm was recorded between 32.0m-33.0m.

The most significant mineralization in D.D.H. 6 is clearly structurally confined within a system of very fine veinlets (which are not uncommonly sub-parallel to the plane of foliation). However, the common prescence of very fine, disseminated granules of galena and sphalerite suggests that the anomalous metals may be of syngenetic origin and have been partly remobilized into open fractures, perhaps during Tabberabberan deformation.

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Analytical results from D.D.H. 1 and D.D.H. 6 tend to indicate that the most significant lead mineralization (> 0.25% Pb) occupies a semi-vertical zone (Refer to: Geological Cross Section TS 27/76, V2-14). In D.D.H. 1 mineralization averaging 0.32% Pb occurs as fine "lenses" and in quartz filled veinlets within the fine grained (volcaniclastic) siltstone/ greywacke unit. In D.D.H. 6 the strongest mineralization occurs in the crystal tuffs underlying the siltstone/greywacke unit. That is to say that the best grades appear to be structurally controlled and not stratiform.

On the other hand, D.D.H. 3 appears to have penetrated the same siltstone/greywacke unit and on into the underlying crystal tuffs. As in D.D.H. 1 the best grades were encountered in the 15 metres or so immediately underlying the sediment/crystal tuff contact, thus faintly suggesting that this is a favourable horizon even though the majority of mineralization is veinlet confined.

The Induced Polarization anomalies observed on lines 10 200N and 10 000N appear to be in response to the local concentration of structurally controlled veinlet mineralization which, of itself, has little economic potential. However, it seems likely that the metal content was initially of syngenetic origin and therefore the (as yet poorly defined) Voyager 2 sediment/tuff succession is regarded as a stratigraphic interval favourable to the formation of massive sulphide deposits.

2. Voyager 2 D.D.H. 2 encountered broken ground and resulted in poor core recoveries, particularly between 35.0-47.0m. Volcaniclastic fine grained sediments, mainly siltstone with minor greywacke, were intersected containing minor siderite veining carrying pyrite, quartz and rare arsenopyrite. The geochemical results from core analyses are considered adequate to explain the surface geochemical anomaly (Cu-Pb).

3. Voyager 2 D.D.H. 3 was drilled for the purpose of evaluating a coincident I.P., V.L.F. (E.M.) and Pb geochemical anomaly. The hole encountered a crystal vitric tuff horizon between 23.0-30.6m containing anomalous galena and pyrite mineralization associated with narrow sericitite and clay filled fractures. The source of the geophysical and geochemical anomalies has been adequately investigated in this location.

4. Voyager 2 D.D.H. 4 intersected a massive sequence of cherty siltstone with minor interbedded greywacke zones. Although an intense network of narrow sericite filled veinlets occurred throughout the core the sulphide content of the core was neglegible. No explaination for the Cu and I.P. anomaly is suggested by the drill hole.

5. Voyager 2 D.D.H. 5 was drilled for the purpose of intersecting the Lewis River Prospect lode at depth. This hole was continued to 54.75m, however failed to intersect the anticipated target. A minor siderite horizon occurs between 8-9.75m and is associated with sericite, pyrite and quartz. This horizon is interpreted as a separate siderite pod and that the main lode has no depth extent in this location.

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LOG. OF VOYAGER 2 D.D.H. 1. ELLIOTT BAY. E.L. 27/76.

PLANNING

Proposer:	C.D. Strickland
Depth:	30m
Location:	Voyager 2 Grid
Purpose of hole:	Evauluation of coincident I.P. anomaly and Pb geochemical anomaly.
Co-ordinates:	10 200N, 10 030E
Inclination:	-60°
Bearing:	090° TN
Approved by:	M.C. Rogers
Date:	1-2-1979

SUMMARY

Logged by:	C.D. Strickland
Results:	Anomalous Pb geochemistry Particularly between 11.0m-33.0m (E.O.H.)

DRILLING

Date terminated:	10-2-1979
Driller:	M.W. Longmore
Core:	AQ 2.5m - 33.0m
Final depth:	33.0m
Reasons for termination:	Target depth reached Minor visible mineralization
Water:	Normal water return

Comments on Drilling Conditions:

Unsatisfactory recovery - very friable sediments.

Voyager 2 D.D.H. 1 Geological Log:

0 - 2.5m No core.

2.5m - 33.0m Volcaniclastic sediments.

Throughout this drill hole very poor core recoveries were achieved varying from 40% - 60%. The remaining core occurs in the form of generally rubble with the largest solid portions only 4cm in length.

The core and rubble consist of pale brown-pale green ultrafine grained siliceous siltstone (vitric tuffs)? representative of well reworked tuffs. Secondary quartz rubble occurs at 5.2m. In the more substantial pieces of core a well defined bedding is present, the orientation of which is as follows:

6.8m	bedding	is	at	70°	to	L.C.A.
7.5m	"	"	"	70°	"	"
8.0m	"	"	"	75°	"	"
9.0m	"	"	"	90°	"	"

At 9.0m an example of micro faulting occurs, showing an offset of approximately 1cm. Vague graded bedding also occurs within an interbedded sequence of siltstone and greywackes (vitric tuffs and crystal tuffs). The fine grained horizons are dominantly more chloritic and contain very narrow (less than 1mm) parallel to bedding, bands of galena and chlorite.

Between 10.8m-11.1m a coarser grained crystal vitric tuff unit is present with crystals up to 1mm. As rubble fragments also appear coarser grained a common interbedding of fine and coarse horizons is assumed.

Geochemically this core is anomalous in lead, the mineralization occurs as very fine (usually 1mm wide or less) lenses of galena often with rare pyrite). The lenses appear to parallel the bedding
e.g. at 28.0m lenses are aligned at 70° to L.C.A.
" " 30.8m " " " " 70° " "

Examples of narrow 1mm-3mm wide quartz filled vughy fractures are present irregularly throughout the core - and contain rarely minor galena and pyrite. e.g. 7.5m, 10.4m, 14.5m, 16.7m and 21.0m. These vughy fractures are roughly aligned at 45° to the L.C.A.

E.O.H. 33.0m.

VOYAGER 2 DIAMOND DRILLING PROGRAMME

Geochemical Results

D.D.H. 1

Co-ordinates 10200N, 10030E

Bearing 090° TN

Dip -60°

Depth 2.5m - 33.0m

KR. No.	Interval	Core Recovered	Cu ppm	Pb ppm	Zn ppm	Ag ppm
5234	2.5 - 4	0.5	110	0.26%	20	5
35	4 - 5	0.5	120	880	20	2
36	5 - 6	0.5	80	380	2	1
37	6 - 7	0.6	110	820	5	1
38	7 - 8	0.5	2	125	5	3
39	8 - 9	0.5	160	0.28%	135	5
5240	9 - 10	0.5	210	0.26%	130	5
41	10 - 11	0.45	80	980	25	1
42	11 - 12	0.5	110	0.18%	40	3
43	12 - 15	0.8	55	0.38%	55	4
44	15 - 16	0.5	20	0.62%	120	5
45	16 - 17	0.5	10	0.26%	25	2
46	17 - 18	0.45	10	0.21%	25	1
47	18 - 21	0.4	30	0.48%	30	3
48	21 - 25	0.4	15	0.30%	910	4
49	25 - 28	0.4	10	0.36%	660	5
5250	28 - 31	0.45	15	0.50%	350	5
5251	31 - 33	0.5	10	0.34%	380	3

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LOG. OF VOYAGER 2 D.D.H. 2 ELLIOTT BAY E.L. 27/76.

PLANNING

Proposer:	C.D. Strickland
Depth:	50m
Location:	Voyager 2 Grid
Purpose of hole:	Evaluation of Cu-Pb geochemical anomaly
Co-ordinates:	10,000N, 9 815E
Inclination:	-60°
Bearing:	090° T.N.
Approved by:	M.C. Rogers
Date:	8-2-1979

SUMMARY

Logged by:	C.D. Strickland
Results:	Eratic mineralization (Py) numerous siderite veinlets.

DRILLING

Date terminated:	15-2-1979
Driller:	M.W. Longmore
Core:	A.Q. 1.4m - 47.0m
Final depth:	47.0m
Reasons for termination:	1. Tested surface geochemical anomaly. 2. Difficult drilling near E.O.H.
Water:	Normal water return

Comments on Drilling Conditions:

Slow drilling in broken ground

Voyager 2 D.D.H. 2 Geological Log

0 - 1.4m No core

1.4 - 16.5m Volcaniclastic siltstone

This unit consists of a pale brown-grey fine grained sequence of siltstones (vitric tuff) generally siliceous and containing irregular patches of chlorite throughout. The interval between 5.6m-7.5m is light brown in colour, probably representing oxidation.

Bedding is not well developed throughout this hole (c.f. V2 D.D.H. 1) although the orientation noted is as follows:

bedding?	at	7.9m	is at	63°	to	L.C.A.
"	"	9.1m	"	" 80°	"	"
"	"	9.7m	"	" 70°	"	"

At 9.6m a massive 2cm wide vein of siderite containing coarse blebs and crystals of pyrite occurs. An increase in the overall chlorite content of the core occurs between 9.3m-9.8m and between 11.0m-16.5m.

At 11.5m massive siderite is present in a 2cm wide vein although rubble and core loss also occur throughout this interval. Pyrite is present with the siderite as rare coarse crystals. Similiar siderite and minor pyrite is present at 12.9m and massive quartz rubble occurs at 13.0m. Between 12.9m-15.9m approximately 70% core loss occurs. Narrow siderite, pyrite, quartz veins cut the core at 65° to L.C.A. at 14.3m and between 15.5m-15.8m massive siderite is associated with blebs of arsenopyrite and quartz. Chloritic rubble between 15.8m-16.5m also contains minor pyrite crystals.

16.5m - 19.8m Greywacke

Pale brown-green sequence of greywacke with minor shale horizons. Unit contains at 18.9m a narrow vein of siderite and pyrite mineralization. Sericitized feldspars up to 2mm are present as a major constituent of this unit. A quartz vein 3mm wide is present at 19.6m cutting the core at 50° to L.C.A. Core recovery throughout this unit is approximately 75%.

19.8m - 35.0m Volcaniclastic siltstone

This chloritic - semi chloritic unit is similar to the above however it is consistantly more mineralized. Between 20.0m-30.5m the unit is irregularly intersected by narrow wispy crosscutting veinlets of siderite and pyrite. The most intense zone of veining occurs between 20.9m-24.0m where the siderite and minor quartz amounts to approximately 20% of the core. The veins are dominantly orientated at 60° to L.C.A., thus paralleling the bedding.

The interval between 25.2m-29.0m consists of an interbedded greywacke-siltstone sequence, best defined at 27.8m where it shows narrow 5mm wide bands and lenses of chloritic siltstone within a coarse greywacke matrix.

Core recovery approximately 60%.

35.0m - 47.0m Rubble

Generally less than 50% core recovery throughout this interval. The rubble recovered is characteristic of a semi chloritic volcaniclastic siltstone, containing minor greywacke horizons. No evidence is present for any significant siderite or pyrite mineralization.

E.O.H. 47.0m.

VOYAGER 2 DIAMOND DRILLING PROGRAMME

Geochemical Results

D.D.H. 2

Co-ordinates 10,000N, 9815E

Bearing 090° TN

Dip -60°

Depth 1.4m - 47.0m

KR No	Interval	Core Recovered	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Au ppb	Sn ppm	W ppm
5252	1.4-3	0.6	10	35	5	-1	-3	-5	10
53	3-4	0.75	2	15	5	-1	-3	5	10
54	4-5	0.6	145	230	15	1	15	5	20
55	5-6	0.6	10	15	20	1	3	5	10
56	6-7	0.7	2	10	25	-1	-3	15	10
57	7-8	0.8	25	10	10	-1	10	20	10
58	8-9	0.8	10	5	10	-1	3	20	10
59	9-10	0.9	15	5	2	1	3	30	10
5260	10-11	0.5	70	-5	2	-1	-3	30	10
61	11-12	0.6	115	10	20	-1	-3	15	10
62	12-14	0.7	25	10	15	-1	-3	25	10
63	14-16	0.75	65	10	15	-1	25	30	20
64	16-17	0.75	95	5	10	-1	-3	20	10
65	17-18	0.7	35	10	5	-1	-3	35	10
66	18-19	0.9	-2	-5	2	-1	3	25	10
67	19-20	0.85	20	-5	5	-1	-3	15	10
68	20-21	0.75	55	-5	15	-1	3	35	10
69	21-22	0.5	45	5	15	-1	5	30	20
5270	22-23	0.75	360	45	15	1	30	15	20
71	23-24	0.9	120	5	20	1	-3	15	10
72	24-25	0.7	40	35	5	1	5	15	10
73	25-26	0.8	70	5	10	-1	3	25	10
74	26-27	0.8	10	-5	10	-1	3	15	10
75	27-28	0.5	55	-5	10	-1	-3	10	10
76	28-29	0.7	360	45	35	2	20	30	20
77	29-30	0.8	80	10	10	-1	3	40	10
78	30-31	0.45	45	5	10	-1	3	20	10
79	31-33	0.55	-2	10	2	-1	5	20	10
5280	33-35	0.45	2	5	5	-1	5	25	10
81	35-37	0.45	2	5	2	-1	15	20	10
82	37-39	0.5	2	5	2	-1	10	10	10
83	39-41	0.5	5	5	5	-1	10	5	10
84	41-43	0.4	2	5	5	1	15	15	10
85	43-45	0.6	5	5	2	-1	15	5	10
5286	45-47	0.6	2	5	2	-1	10	5	10

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LOG. OF VOYAGER 2 D.D.H. 3 ELLIOTT BAY E.L. 27/76.

PLANNING

Proposer:	C.D. Strickland
Depth:	40m
Location:	Voyager 2 Grid
Purpose of hole:	Evaluation of coincident I.P., V.L.F. (E.M.) and Pb geochemical anomalies.
Co-ordinates:	10,000N, 10175E.
Inclination:	-60°
Bearing:	090° TN
Approved by:	M.C. Rogers
Date:	12-2-1979

SUMMARY

Logged by:	C.D. Strickland
Results:	Anomalous geochemistry within a unit of crystal vitric tuff.

DRILLING

Date terminated:	20-2-1979
Driller:	M.W. Longmore
Core:	AQ 0.8m - 42.0m
Final depth:	42.0m
Reasons for termination:	Tested anomaly
Water:	Normal water return

Comments on Drilling Conditions:

Slow drilling in broken ground

Voyager 2 D.D.H. 3 Geological Log

0m - 0.8m No core

0.8m - 23.0m Volcaniclastic sediments

This unit consists of a bedded sequence of volcaniclastic greywackes and siltstones (vitric tuffs) ranging in colour from pale brown to dark green. The sequence is semi oxidized to 5.5m and contains sericite throughout. The fragment size within the greywackes varies from 1mm-2mm and the zones of siltstones appear to have suffered most from core loss and are present mainly as rubble. Pyrite veins up to 3mm are present approximately parallel to cleavage at 8.0m, aligned at 58° to L.C.A. Subtle variations in the chlorite and sericite content of the greywacke define the bedding e.g. at 6.5m, 60° to L.C.A.

Core recoveries are variable over this interval, average 60% however severe core losses occur between 6m-13m (50% recovery only).

23.0m-30.6m Crystal vitric tuff pyroclastics

A distinct change in lithology occurs within a zone of rubble between 20m-24m. This unit is characterized by a coarser texture with rounded blue quartz and angular quartz crystals up to 3m (average 2mm). The interval is chloritic throughout and seritized feldspars and wispy sericite are diagnostic.

Much of the core is rubble.

Fine pyrite and galena are visible at 28.3m, 30.0m and 30.4m associated with narrow sericite and clay filled fractures parallel to cleavage and bedding? Based upon the geochemical results it appears this minor veining occurs throughout the interval however much of the core is only rubble.

Core recovery approximately 70%

30.6m - 42.0m <u>Vitric crystal tuff pyroclastics</u>

This unit is characterized by a larger quartz and feldspar component than above both rounded and crystalline up to 3mm. The rounded quartz crystals are blue in colour and the feldspars are generally weathered to sericite. At 38.20m a narrow cross cutting vein contains sericitized feldspar. Microscopic pyrite crystals occur at 38.30m. Between 38.10m - 38.35m the core contains pale green-brown zones up to 2 cm which appear to be lithic fragments although their boundaries are indistinct. The fragments do not appear to contain the blue quartz as does the surrounding core. This zone may represent a vitric crystal lithic tuff.

Between 31.0m - 33.0m a unit of cleved-bedded? greywacke occurs, similar to that described above. The dominant cleavage orientation is 65° largely defined by sericite. The core recovery throughout the interval is less than 25%.

This interval between 30.6m - 42.0m has some characteristics of a rhyolitic porphyritic lava however there is insufficient solid core examples to enable a firm description thus it is called a vitric crystal tuff.

Core recovery is approximately 60%, with between 50-70% as rubble.

E.O.H. 42.0m.

VOYAGER 2 DIAMOND DRILLING PROGRAMME

Geochemical Results

D.D.H. 3

Co-ordinates 10,000N, 10175E

Bearing 090° TN

Dip -60°

Depth 0.8m - 42.0m

KR No.	Interval	Core Recovered	Cu ppm	Pb ppm	Zn ppm	Ag ppm
5287	0.8-4	0.5	5	80	25	-1
88	4-5	0.75	-2	130	75	-1
89	5-6	0.7	2	60	105	-1
5290	6-7	0.5	5	105	90	-1
91	7-9	0.55	45	125	130	1
92	9-13	0.5	-2	95	75	1
93	13-14	0.9	5	420	125	1
94	14-15	0.9	10	540	85	1
95	15-16	0.7	10	480	310	1
96	16-17	0.7	2	320	140	1
97	17-18	0.7	2	800	145	1
98	18-20	0.65	2	260	70	1
99	20-22	0.6	25	760	560	6
5300	22-24	0.5	45	0.12%	240	2
01	24-27	0.7	45	780	220	1
02	27-28	0.7	130	0.54%	120	9
03	28-29	0.7	250	0.46%	90	8
04	29-31	0.8	115	0.50%	170	6
05	31-34	0.5	145	0.34%	240	7
06	34-37	0.7	10	880	85	1
07	37-38	0.5	20	420	125	1
08	38-40	0.6	25	70	75	-1
5309	40-42	0.6	2	30	65	-1

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LOG. OF VOYAGER 2 D.D.H. 4 ELLIOTT BAY E.L. 27/76.

PLANNING

Proposer:	C.D. Strickland
Depth:	30m
Location:	Voyager 2 Grid
Purpose of hole:	Evaluation of coincident I.P. and Cu geochemical anomaly.
Co-ordinates:	9630N, 10,000E
Inclination:	-60°
Bearing:	090° TN
Approved by:	R.R. Large
Date:	16-2-1979

SUMMARY

Logged by:	C.D. Strickland
Results:	No significant mineralization

DRILLING

Date terminated:	1-3-1979
Driller:	M.W. Longmore
Core:	AQ 0.2m - 30.7m
Final depth:	30.7m
Reasons for termination:	Tested anomaly to 30m. No significant results.
Water:	Normal water return

Comments on Drilling Conditions:
Slow drilling in broken ground

Voyager 2 D.D.H. 4 Geological Log

0m - 0.2m No core

0.2m - 30.7m Volcaniclastic sediments

This sequence consists of interbedded cherty siltstone (vitric tuff) and coarser grained greywacke with the siltstone lithology dominating. The core varies from light brown to pale green with the most cherty zones being pale brown. Mineralization in the form of very narrow veinlets (0.2mm wide) and isolated crystals and blebs occur rarely and irregularly throughout this interval.

Greywacke is present between 5.5m - 6.0m at which point an abrupt contact, orientated at 80° to L.C.A., is present. Well defined bedding between siltstone and greywacke beds, when the greywacke horizons are up to 1cm thick occur at 11.6m; bedding is at 80° to L.C.A. A massive greywacke unit occurs between 14.3m - 15.6m.

Intense sericite veining occurs in a complex network of veinlets at both 45° and 90° to L.C.A. Within semi-chloritic siltstone between 12.0m - 13.0m.

A large 3mm pyrite cube occurs in chloritic siltstone at 24.10m.

The core recovery throughout the hole is variable between 20 - 40%, mainly the cherty zones are cored the remainder occurs as broken core and rubble.

30.7m E.O.H.

VOYAGER 2 DIAMOND DRILLING PROGRAMME

Geochemical Results

D.D.H. 4

Co-ordinates 9630N, 10,000E

Bearing 090° TN

Dip -60°

Depth 0.2m-30.7m

KR No	Interval	Core Recov-ered	Cu ppm	Pb ppm	Zn ppm	Ag ppm
5310	0.2-3	0.6	5	10	10	-1
11	3-6	0.55	60	20	15	-1
12	6-9	0.7	40	35	40	-1
13	9-11	0.7	35	80	70	-1
14	11-12	0.6	5	50	20	-1
15	12-14	0.7	55	190	75	1
16	14-15	0.7	30	85	65	-1
17	15-19	0.6	90	30	20	-1
18	19-22	0.5	110	20	10	-1
19	22-24	0.75	10	35	85	-1
5320	24-26	0.8	15	20	10	1
21	26-27	0.7	25	5	10	-1
22	27-28	0.5	105	5	15	-1
5323	28-30.7	0.8	90	5	15	-1

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LOG. OF VOYAGER 2, D.D.H. 5 ELLIOTT BAY E.L. 27/76.

PLANNING

Proposer:	R.R. Large
Depth:	60m
Location:	Voyager 2 Grid
Purpose of hole:	Evaluation of Lewis River Prospect lode at depth.
Co-ordinates:	10,050N, 9935E
Inclination:	-68°
Bearing:	070° TN
Approved by:	R.R. Large
Date:	12-3-1979

SUMMARY

Logged by:	C.D. Strickland
Results:	Failed to intersect major siderite lode at depth.

DRILLING

Date terminated:	17-3-1979
Driller:	M.W. Longmore
Core:	AQ 0.2m - 54.75m
Final depth:	54.75m
Reasons for termination:	Reached depth capacity of equipment
Water:	Normal water return

Comments on Drilling Conditions:
Slow drilling in broken ground

Voyager 2 D.D.H. 5 Geological Log

0m - 0.2m No core

0.2m - 54.75m <u>Volcaniclastic sediments</u>

This unit consists of an interbedded sequence of greywackes and siltstones showing well defined sedimentary structures. The siltstones are in part cherty and vary in colour from pale brown to grey-green. Broadly the beds of greywacke/siltstone are several metres thick, however on a small scale horizons of greywacke are as thin as 2mm. Unfortunately severe core loss and broken core prevent the detailed descriptions of the interbedding.

Rare blebs of pyrite up to 3mm occur in the greywacke unit, e.g. 3.2m and 3.5m. Narrow irregular veins of siderite, quartz, chlorite and minor pyrite occur between 4.0m-10.0m. The zone between 8.0m-9.75m contains massive fractural siderite, sericite and quartz with white secondary quartz vein rubble at approximately 9.5m, pyrite occurs as irregular blebs and accounts for approximately 1% of the core.

Between 8m-10m the core recovery is approximately 50%.

Fine shales, vitric tuffs (cherty shales) and greywackes continue from 10m down the hole containing rare pyrite cubes and equally rare narrow veins of siderite, sericite and quartz. e.g. 25.6m, and 31.2m. At approximately 30.0m pale brown/cream rafts of siltstone between 2-12mm wide occur with in a fine grained greywacke host.

The bedding within the fine shales, defined more by chemical composition changes rather than by changes in grain size is consistantly at approximately 80° to L.C.A., the narrow veinlets of siderite also parallel this orientation.

A 10cm wide quartz vein associated with minor siderite-sericite occurs at 40.6m.

Between 43.0m-54.75m rubble only is present with less than 10% core recovery.

E.O.H. 54.75m

VOYAGER 2 DIAMOND DRILLING PROGRAMME

Geochemical Results

D.D.H. 5

Co-ordinates 10 050N, 9935E

Bearing 070° TN

Dip -68°

Depth 0.2m - 54.75m

KR No	Interval	Core Recovered	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Au ppb	Sn ppm	W ppm
5324	0.2-2	0.5	95	5	30	-1	20	15	10
25	2-3	0.6	30	10	25	-1	10	10	20
26	3-4	0.5	170	10	20	-1	15	15	10
27	4-6	0.5	140	10	30	-1	30	10	-10
28	6-7	0.45	370	70	160	1	20	10	10
29	7-8	0.6	640	40	130	2	10	5	20
5330	8-10	0.9	0.28%	310	340	8	65	20	20
31	10-13	0.85	0.11%	220	85	2	25	15	10
32	13-16	0.45	30	10	15	-1	10	15	10
33	16-19	0.5	40	20	15	-1	10	20	10
34	19-22	0.4	15	20	20	-1	5	10	-10
35	22-23	0.45	5	10	25	-1	10	15	-10
36	23-25	0.7	5	45	10	-1	5	25	-10
37	25-26	0.7	10	10	15	-1	5	20	10
38	26-28	0.75	60	20	40	-1	15	20	10
39	28-31	1.0	5	20	20	-1	10	15	10
5340	31-32	0.9	5	10	20	-1	25	20	10
41	32-33	0.8	2	10	15	-1	5	20	10
42	33-34	0.8	2	15	20	-1	15	15	10
43	34-35	0.75	5	15	20	-1	-3	20	10
****									
45	35-36	1.0	10	70	20	-1	10	20	10
46	36-37	0.45	10	15	20	-1	15	15	10
47	37-38	0.75	2	20	20	-1	5	15	10
48	38-39	0.6	105	20	30	-1	3	20	-10
49	39-40	0.5	5	15	10	-1	5	25	10
5350	40-41	0.6	5	30	10	-1	10	-5	10
51	41-42	0.7	5	20	15	-1	-3	15	10
52	42-43	0.5	100	30	20	-1	-3	25	-10
53	43-45	0.6	5	35	15	-1	-3	20	10
54	45-48	0.45	5	35	20	-1	-3	10	10
5355	48-54.75	0.45	95	540	60	1	-3	20	10

**** Note: KR 5344 Not applicable.

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LOG. OF VOYAGER 2 D.D.H. 6 ELLIOTT BAY E.L. 27/76

PLANNING

Proposer:	R.R. Large, W. Herrmann
Depth:	200m
Location:	Voyager 2 Grid
Purpose of hole:	To further define the coincident Pb-Zn/I.P. anomaly investigated by Voyager 2. D.D.H. 1.
Co-ordinates:	10202.8N, 9921.6E
Inclination:	-51°
Bearing:	091°TN
Approved by:	R.R. Large
Date:	6-2-1980

SUMMARY

Logged by:	W. Herrmann
Results:	9m @ 1.61% Pb, 0.24% Zn, 21.2 g/t Ag between 135m-144m.

DRILLING

Rig	F 30
Date terminated:	14-3-1980
Driller:	G. Steele, A. Murphy
Core:	4.30m - 58.85m NQ 58.85m - 200.35m BQ
Final depth:	200.35m
Reasons for termination:	Intersected target zone 160-180m
Water:	Drilling additives used: Rotrol

Comments on Drilling Conditions:

Generally poor, fine grained lithologies 35m-160m strongly cleaved and locally very broken.

Core recovery (average) 75%

V 2 D.D.H. 6 — Geological Core Log

0 - 4.50m	No core
4.50 - 32.40m	Medium grained, rhyolitic, quartz crystal tuff.

A lithologically uniform rock unit consisting of small to medium grains (1-4mm) of equant, subhedral quartz crystals and crystal fragments sparsely distributed through a fine granular, non stratified and poorly sorted pale buff-grey siliceous/felsic matrix. Average grain size of matrix components about (0.2-0.5mm). Feldspar is fine and generally not well crystallized, presumably strongly altered and now represented by fine amorphous looking whitish material - sericite?
Small interstitial or 'wispy' aggregates of fine pale brownish-grey mica probably is representative of former biotite or chlorite. A faint streakiness or weakly developed foliation is expressed by the wisps of mica
The foliation cuts the core at angles varying from near perpendicular to about 60° to the long axis of core.

The core is not strongly oxidized, even at 4.5 metres and although somewhat broken, the core recovery is reasonable, averaging about 85% for the interval 4.5 - 32.4 metres.

Minor traces of pyrite occur, usually as fine disseminated subhedral specks or fine aggregates and as fine 'smears' on some joint surfaces/core breaks.

Pyrite is first noted at 8.5m and is of rather patchy local abundance but nowhere exceeds 0.5% of the rock volume.

Occasional small quartz veinlets varying from 1mm to about 15mm width cut the core at infrequent intervals and at various orientations.
These are generally unmineralized although minor (euhedral) pyrite is noted occasionally. Some of the veinlets are partly cavernous due to leaching of some mineral which appears to have been dark grey (blackish) chlorite (see sample at 12.3 metres).
The veinlets also commonly carry upto about 40% of pale straw coloured carbonate believed to be siderite. (No effervescence in cold dilute HCl; weak effervescence in hot dilute HCl). This mineral is also presumed to occur to some small extent within the actual matrix of the tuff.

The poor sorting and non stratified character of the rock suggests a pyroclastic rather than sedimentary facies of deposition.

32.40 - 56.05 Fine grained (rhyolitic) vitric tuff.

A very fine grained pale grey rock consisting of small (< 0.3mm) granules of quartz (10% modal) contained in a fine grained streaky foliated matrix consisting apparently of fine pyroclastic ash and possible small (devitrified) glassy shands. Average grain size of ground mass would be equivalent to fine siltstone.

As noted, the matrix is more or less distinctly foliated; at least part of this foliation is primary due to flattened shards(?) and small lensoidal 'layers' (which are < 10mm long) of pale siliceous composition and sometimes of slightly chloritic appearance. (not regarded as fiammi or flattened lithic fragments). However, the silky phyllitic appearance suggests an imposed foliation, parallel to primary layering (? due to alignment of fine micaceous minerals.
The plane of foliation cuts the core at approximately perpendicular to the longitudinal axis of core.
Minor crenulations, not fully developed into cleavage, but with axes semi parallel to L.A.O.C., are locally developed.

The uniform fine grain size of this rock unit suggest it may be a fairly distal type of pyroclastic, possibly subaqueous and deposited more or less as a sediment but with dominantly volcanic provenance.

It is probable that the fine matrix contains a fair amount of devitrified volcanic glass but this is likely to have been deposited, probably sub-aqueously, as fine solid, ash particles - the possiblility of a subaerial, vitric welded tuff is not favoured.

The contact of this unit with the above, medium grained quartz, crystal tuff, is exposed in the core, appears to be quite sharp and is marked by a 5cm band of carbonate rich rock. The pale straw coloured carbonate occurs in small (2cm) plump, (fractured) lenses in an apparently conformable layer; some carbonate also appears to exist within the matrix of the enclosing tuffs adjacent to the contact especially in the medium grained quartz.

There is a notable increase in pyrite content within the carbonate and immediately adjacent to the contact; pyrite is around 5% and occurs in association with minor chalcopyrite, as small disseminated blebs and euhedral grains.

Mineralization otherwise, in this unit, is confined to more disseminated euhedral grains of pyrite and occasional minor occurrences of pyrite-galena-sphalerite (?) -chalcopyrite (?) in association with pale straw coloured carbonate in fine veinlets or minor breccia zones. (Examples: (a) at 45.3m - galena in carbonate veinlet, sub parallel, semi crosscutting to foliation.

(b) 46.3m: pyrite in quartz-carbonate filled breccia zone.

However mineralization is barely significant and combined Pb + Zn is not expected to average better than 0.2%.

56.05 - 57.25 No core - Sand

Sample consists of finely divided, flakey, angular, sand sized particles (average 0.5mm) of fine grained pale grey rock. The lithology is probably similar to the above described unit which has been sheared and then finely broken up by the drill bit. A pale brown oxidation/ staining suggests the prescene of minor fine pyrite.

57.25 - 63.4 Shear zone

The core is strongly sheared; in places consists of pale grey puggy clay with small angular brecciated fragments of rock. A few sections of better preserved core appear to be of strongly sheared, layered fine grained tuffaceous siltstone with alternating bands of pale and dark grey material.

Orientation of shear planes is almost parallel varying to about 20° to the core axis.

Minor disseminated pyrite occurs in the sheared rock. Core recovery is very poor at about 20%.

63.4 - 130.15m

Fine grained tuffaceous Siltstone and Greywacke.

This is a rather variable lithology but dominated by very fine grained massive pale grey tuffaceous siltstone and minor greywacke. It is locally finely layered or banded with pale grey siliceous and darker carbonaceous (?) or chloritic bands. Composition overall is distinctly siliceous - probably approximating the dacitic composition though possibly a little more argillaceous in the finer grained layers.

Above about 90m depth the rock is mostly fine grained siltstone but further down there are layers of coarser grain size, upto fine sand size, and these are termed greywacke. In places rapid alternations betwen fine and coarse layers may be observed (as at 108.7m) - though there does not appear to be a great compositiona variation.

The layering is definately primary and sedimentary and indicates a subaqueously deposited or reworked fine volcanic tuff or ash.

Layering to core axis angles vary slightly; perhaps indicating minor local folding or sedimentary slump structures.
Measured bedding angles:

74.35m	90°
74.6m	50°
75m	70°
83.5m	80°
108.55m	75°

Cleavage or weak foliation is generally semi perpendicular to core axis even when the layering is oblique.
(e.g. at 74.6m).

Pyrite is a generally distributed but very minor ($< 0.5\%$) accessory occuring as small disseminated euhedral specks, smears on joint surfaces and in fine cross-cutting veinlets.
Minor galena and sphalerite is also locally present in fine veinlets (usually $<$ 1mm wide) and also as <u>very</u> fine (50 - 100 microns) disseminated specks which appear to be slightly more prominent in the coarser greywacke layers.
A small amount of pyrrhotite occurs as small flattened lenses (1-2mm), oriented parallel to bedding in a finely layered greywacke/siltstone at 108.7m.

Grade is not expected to average better than 0.1% Pb + Zn combined.

Core is generally badly broken and recovery is variable, averaging about 70%.

130.15 - 170.4

Fine to medium grained Crystal (vitric/ lithic) tuff.

The contact with the above unit is obscured by core loss related to minor shearing but it would seem that the contact is fairly sharp.

From 130.15 on the rock is a massive, fine grained, pale grey crystal vitric tuff consisting of small subround granules of clear quartz and minor creamy feldspar, contained in an aphanitic pale grey matrix presumed to consist of fine ash and (devitrified) glass. Quartz crystals generally 0.5-1.0mm, not closely crowded but evenly distributed, approximately 15% modal.

Massive, white vein quartz is present in the interval 150.2-150.9m.

Around 160m depth there is a transitional change to a slightly coarser rock of equivalent composition which may be classed as medium grained. There is a slight but noticeable increase in the proportion of creamy feldspar crystals. Sub-rounded small lithic fragments of dark finely porphyritic glassy lava, are an occasional constitiuent.

A weak foliation, defined by streaky layering of wispy chloritic material, is present, usually oriented approximately at right angles to the core axis.

Galena, reddish brown sphalerite, pyrite and very minor chalcopyrite are present in fine, irregular and cross-cutting veinlets in association with quartz and pale straw coloured carbonate. The sulphides also occur as fine disseminated specks but this is generally subordinate to veinlet mineralization. Overall grade for the unit estimated at 0.5% Pb+ Zn.

Core is badly broken down to 160m.; the coarser tuffs seem to be less fractured. Overall core recoveries about 80%.

170.4 - 200.35

Inhomogenous coarse grained quartz crystal tuff.

A texturally rather inhomoganous rock type, essentially equivalent to the former but characterized by very coarse quartz crystals, upto about 6mm diameter.

The rock is crudely layered with narrow wavy layers of dark chloritic matrix irregularly alternating with layers of pale grey to creamy matrix.

Clear rounded quartz crystals, smaller creamy feldspar grains and occasional small lithic fragments are general constituents with some crystal grain size variation from about 1-2mm upto 6mm diameter.

A foliation is defined by wispy streaks of dark chloritic material, usually approximately at right angles to core axis.

The composition is distinctly acid, probably approximating to dacitic, although this unit appears to contain rather more chlorite than those previously described. It is considered that much of the chlorite is probably of primary origin.

Galena, sphalerite and minor pyrite mineralization occurs in the familiar fine veinlets and fine disseminated specks but is generally not as well developed as in the previous unit.

Core recovery is fairly good, averaging about 90%.

VOYAGER 2 DIAMOND DRILLING PROGRAMME

Geochemical Results

D.D.H. 6

Co-ordinates 10 202.8N, 9921.6E

Bearing 091° TN

Dip -51°

Depth 4.5m - 200.35m

KR No	Interval	Core Recovered	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Fe %	Au ppb
5728	4.5-6.0	1.0	10	20	20	1	0.20	
29	6.0-7.0	0.8	30	90	125	1	0.40	
5730	7.0-8.0	1.0	20	50	840	1	0.56	
31	8.0-9.0	1.0	70	75	50	1	0.34	
32	9.0-10.0	0.9	120	60	80	1	0.60	
33	10.0-11.0	0.75	20	30	120	1	1.36	
34	11.0-12.0	1.0	10	25	130	1	2.36	
35	12.0-13.0	0.8	5	15	45	1	4.08	
36	13.0-15.0	0.8	5	10	60	1	4.16	
37	15.0-18.0	1.0	5	15	25	1	4.00	
38	18.0-19.0	1.0	10	20	50	1	4.40	
39	19.0-20.0	1.0	5	20	55	1	2.56	
5740	20.0-21.0	1.0	2	20	65	1	3.36	
41	21.0-22.0	1.0	10	20	50	1	3.36	
42	22.0-23.0	1.0	2	25	50	1	2.80	
43	23.0-24.0	1.0	10	20	55	1	4.96	
44	24.0-25.0	1.0	5	20	45	1	5.12	
45	25.0-27.0	1.4	5	40	10	1	4.72	
46	27.0-29.0	1.2	2	55	60	1	3.28	
47	29.0-31.0	1.2	2	20	40	1	4.64	
48	31.0-32.0	0.9	5	15	65	1	4.16	
49	32.0-33.0	1.0	480	60	105	1	5.52	
5750	33.0-34.0	1.0	30	20	25	1	1.36	
51	34.0-38.0	1.0	40	75	145	1	2.80	
52	38.0-42.0	1.0	25	70	60	2	2.64	
53	42.0-44.0	0.4	110	85	40	2	3.52	
54	44.0-46.0	2.0	50	330	120	4	3.76	
55	46.0-47.0	1.0	260	290	230	4	9.60	
56	47 -51	1.4	380	520	80	7	3.76	
57	51 -53	1.7	30	50	25	1	2.40	
58	53 -55	1.0	15	50	30	1	2.72	
59	55 -57	0.5	50	260	150	2	2.28	
5760	57 -59	0.3	30	75	200	1	2.36	

052

075053

KR No	Interval	Core Recovered	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Fe %	Au ppb
5761	59 -61	0.3	55	100	280	2	3.20	
62	61 -63	0.3	110	140	60	2	2.28	
63	63 -67	0.4	45	110	100	2	2.96	
64	67 -71	0.5	120	140	90	3	3.52	
65	71 -75	1.8	80	190	200	4	3.28	
66	75 -76	0.9	30	110	75	1	3.12	
67	76 -77	0.9	Sample missing					
68	77 -79	0.9	60	150	60	3	4.08	
69	79 -80	0.8	55	370	210	5	1.84	
5770	80 -82	1.2	60	410	300	4	5.04	
71	82 -83	0.9	10	160	70	2	1.40	
72	83 -84	0.8	20	75	30	1	2.64	
73	84 -85	1.0	60	520	90	1	2.40	
74	85 -86	1.0	100	180	110	2	2.88	
75	86 -87	1.0	30	600	280	3	1.44	
76	87 -88	1.0	5	640	55	2	0.72	
77	88 -89	1.0	25	0.14%	680	3	1.76	
78	89 -90	1.0	15	0.24%	300	3	1.64	
79	90 -91	1.0	10	0.13%	80	2	2.08	
5780	91 -92	0.9	10	520	95	1	2.64	
81	92 -93	0.8	15	420	660	1	1.28	
82	93 -95	1.0	20	0.20%	0.10%	3	1.40	
83	95 -97	0.9	10	840	490	1	0.72	
84	97 -99	0.3	20	0.24%	370	3	1.12	
85	99 -101	1.0	20	500	165	2	2.00	
86	101 -102	1.0	15	640	640	1	0.52	
87	102 -103	1.0	10	270	240	1	0.32	
88	103 -104	0.9	15	840	160	1	3.04	
89	104 -105	0.9	15	800	120	2	1.92	
5790	105 -106	0.8	20	0.11%	240	2	0.88	
91	106 -107	0.9	20	840	270	2	1.64	
92	107 -108	1.0	15	270	220	2	1.84	
93	108 -109	1.0	70	840	740	6	3.36	
94	109 -111	0.5	15	130	300	1	0.68	
95	111 -113	0.5	20	480	230	1	0.60	
96	113 -114	0.5	10	0.16%	860	2	0.44	
97	114 -116	0.8	180	470	0.12%	1	0.56	
98	116 -118	0.3	20	0.15%	680	2	0.48	
99	118 -120	0.3	35	290	240	1	0.48	
5800	120 -122	0.4	90	130	100	1	0.40	
01	122 -124	0.8	25	240	0.13%	1	0.76	
02	124 -125	0.7	20	0.11%	350	2	1.04	
03	125 -126	0.8	45	300	580	1	1.12	
04	126 -128	1.0	50	920	0.34%	2	0.68	
05	128 -130	1.0	85	0.44%	0.25%	8	1.20	
06	130 -131	0.8	150	0.14%	0.14%	4	4.56	
07	131 -133	1.0	40	0.20%	200	4	1.92	
08	133 -134	0.7	210	0.19%	0.22%	4	0.76	
09	134 -135	0.8	200	0.17%	680	4	1.04	
5810	135 -136	0.7	190	2.96%	700	38	2.96	25

053

075054

KR No	Interval	Core Recov-ered	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Fe %	Au ppb
5811	136-137	0.7	150	2.40%	980	32	1.72	30
12	137-138	0.8	260	1.76%	0.10%	22	1.80	10
13	138-139	0.9	210	2.00%	500	26	2.00	10
14	139-140	0.9	130	2.08%	0.84%	28	2.20	10
15	140-141	0.9	75	0.80%	0.11%	11	1.12	
16	141-142	0.9	190	0.92%	0.50%	13	2.88	
17	142-143	1.0	80	0.44%	0.14%	7	1.68	
18	143-144	0.9	70	1.16%	0.22%	14	1.80	(3
19	144-145	0.9	50	0.48%	400	6	1.40	
5820	145-146	1.0	70	0.56%	410	6	3.60	
21	146-147	0.9	160	0.76%	230	10	4.16	
22	147-149	0.9	25	0.64%	130	7	2.20	
23	149-150	0.6	20	0.36%	310	5	2.32	
24	150-151	0.5	25	680	60	1	1.76	
25	151-152	0.7	10	260	145	1	1.36	
26	152-153	0.5	75	0.36%	700	5	1.96	
27	153-154	0.6	80	0.32%	250	5	4.56	
28	154-155	0.9	15	0.10%	800	2	1.40	
29	155-157	0.2	30	0.11%	0.14%	3	2.96	
5830	157-159	0.6	160	0.52%	460	14	5.20	
31	159-161	1.0	70	0.11%	220	4	1.92	
32	161-162	0.9	20	0.20%	340	4	1.40	
33	162-163	0.9	10	0.11%	600	3	0.88	
34	163-164	1.0	20	0.14%	360	3	1.52	
35	164-165	0.9	15	0.16%	195	3	1.80	
36	165-166	1.0	40	0.20%	0.11%	3	1.76	
37	166-167	1.0	180	0.36%	0.10%	6	1.40	
38	167-168	1.0	25	0.40%	820	9	1.52	
39	168-169	1.0	30	0.24%	0.13%	3	1.36	
5840	169-170	1.0	10	0.20%	0.12%	3	1.24	
41	170-171	1.0	10	0.16%	140	3	2.44	
42	171-173	0.7	25	0.11%	150	3	2.28	
43	173-174	0.8	30	920	360	3	2.28	
44	174-175	0.8	20	0.19%	330	3	2.04	
45	175-176	1.0	25	0.10%	460	2	2.00	
46	176-177	0.9	85	0.10%	240	2	2.24	
47	177-178	1.0	80	0.20%	120	4	3.92	
48	178-179	1.0	60	0.24%	110	4	4.24	
49	179-180	0.9	40	0.12%	100	3	3.44	
5850	180-181	1.0	10	0.18%	65	3	2.44	
2982	181-182	1.0	20	440	70	2	2.28	
83	182-183	1.0	20	720	60	2	2.52	
84	183-184	1.0	15	160	70	2	2.20	
85	184-185	1.0	10	480	90	2	2.08	
86	185-186	0.9	5	100	55	1	2.16	
87	186-187	0.8	15	470	120	2	3.44	
88	187-188	0.4	40	600	180	2	3.12	
89	188-189	0.9	90	0.14%	500	3	4.16	
2990	189-190	1.0	45	300	145	2	2.20	

KR No	Interval	Core Recov-ered	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Fe %	Au ppb
91	190-191	1.0	20	170	110	1	1.92	
92	191-192	1.0	5	220	150	2	1.68	
93	192-193	1.0	20	480	220	3	2.56	
94	193-194	1.0	20	430	100	2	2.40	
95	194-195	1.0	70	420	65	2	2.24	
96	195-196	0.8	80	0.12%	55	3	3.04	
97	196-197	0.8	40	0.24%	60	17	3.04	
98	197-198	0.9	30	0.10%	150	5	4.32	
99	198-199	1.0	40	0.32%	0.13%	13	2.32	
3000	199-200.35	1.35	50	960	0.10%	4	2.36	

OPERATION OF LEGEND

1. Capital letter — indicates primary classification e.g. S - sedimentary rock, A - acid rock, M - basic rock

2. Lower case letters — indicate the following
   (i) Colours - e.g. pk/grnA = pink fragments in an acid igneous rock with a green matrix.
   (ii) Textural or structural features - e.g. xtA = crystal tuff of acid composition, e.g. pA = porphyric acid rock, e.g. oxA = oxidised acid rock

   b. As suffixes in progressive order:
   (i) Categorised - e.g. pAr = rhyolite, e.g. Io = intermediate rock of andesitic composition
   (ii) Mineralogy - e.g. pArf = porphyritic (rhyolite) with feldspar phenocrysts, e.g. lxt f/b = lithic crystal tuff with feldspar (phenocryst component) and biotite (prominent matrix component), e.g. lxt f q = lithic crystal tuff with (major) feldspar crystals and (minor) quartz crystals, e.g. fb mg pArqfs (black specks) = flow banded porphyitic rhyolite with quartz (major phenocryst component, size range 1mm - 5mm), feldspar (minor phenocryst component), sericite (prominent matrix component), and black specks (minor undifferentiated accessory mineral).

SYMBOLS

IGNEOUS

A	acid igneous unclassified
Ar	rhyolite
I	intermediate igneous unclassified
Io	andesite
Id	dacite
M	basic igneous unclassified
Mv	basalt
Md	dolerite
Gr	granite

SEDIMENTARY

Ssh	shale
Sltst	siltstone
Sst	sandstone
Sqtz	quartzite
Scongl	conglomerate
Sv	volcaniclastic sediment

STRUCTURAL and TEXTURAL

t	tuff unclassified
lt	lithic tuff
xt	crystal tuff
vt	vitric tuff
fb	flow banding
p	porphyritic
clvd	cleaved
shd	sheared
ox	oxidized
vns	veins
lam	laminated
brec	brecciated
sch	schistose

STRUCTURAL

	outcrop limit
	rubble boundary
	interpretative contact
	bedding
	joint
	cleavage
	primary foliation
	fault
	unconformity

SILICATE MINERALOGY

q	quartz
f	feldspar
mus	muscovite
b	biotite
c	chlorite
s	sericite
cb	carbonate
mafics	mafics
hb	hornblende
sid	silicified
ferromag	ferromagnesions

SULPHIDE MINERALOGY

s	sulphides
py	pyrite
cpy	chalcopyrite
gn	galena
hm	hematite
mag	magnetite
gos	gossan
lim	limonite

COLOURS

pk	pink
grn	green
brn	brown
ple	pale
dk	dark
wte	white
gry	grey
pur	purple

GRAIN SIZE

fg	fine grained (< 1mm)
mg	medium grained (1mm - 5mm)
cg	coarse grained (5mm - 5cm)

MISCELLANEOUS

TS 3033	Thin section and rock No
* 1112	Geochemical analysis and rock No
	Grid traverse
	Anomaly centre (approximate)
	Old workings
	Compsite

GEOLOGICAL INTERPRETATION

Pencil No		
19-1	TERT	(Macquarie Beds)
19-6	L ORDO	Conglomerate (Owen type), sandstones (Scongl, Sst)
19-50	Io	Andesite
19-67	M	Basic dyke
19-10	U€ ?	Granite (Gr)
19-13	€	Sandstone (Sst)
19-17	€	Fine grained volcaniclastic sediments (fg Sv(sst), Sv(Ssh),)
19-18	€	Coarse grained sedimentary breccia (cg S(brec))
19-19	€	Porphyritic quartz - feldspar rhyolitic lava (fbpArqf)
19-21	€	Feldspar - quartz - biotite porphyry (cg pArfqb)
19-24	€	Rhyolitic vitric pyroclastics Vitric tuff, vitric crystal tuff (vtq, vxtq)
19-28	€	Rhyolitic crystal pyroclastics Crystal tuff, crystal lithic tuff (xtq, xltqf)
19-32	€	Rhyolitic lithic pyroclastics Lithic tuff, lithic crystal tuff, lithic vitric tuff, (cgltqf, mglxtqf, lvtqf)
19-70	PRE €	Undifferentiated quartzite, quartz mica schist (Sqtz, fglam sch Ssh mus)

Voyager 12 Prospect

5246000N

5 246 000 N

V2/ DDH 6
Coords. 10202·8N, 9921·6E
Brg 091° TN
Dip −51°
Depth 200·35m

V2/ DDH 1.
Coord. 10 200 N 10030 E
Brg. 090° TN
Dip −60°
Depth 0 − 2·5m auger pre-collar
2·5 − 33·0m Diamond Drilling, AQ

V2/ DDH 1
384325E
5245600N
V2/DDH 2.
384125E
5245400N
V2/DDH 3
384475E
5245400N
V2/DDH4
384300E
5245030N.
V2/DDH 5
384235E
5245450N.
V2/DDH6.
384225E
5245600N.

Lewis River Prospect Workings

V2/DDH 5
Coord 10050 N 9935 E
Brg 070° TN
Dip −68°
Depth 0-0·2m auger pre-collar
0·2m− 54·75m Diamond Drilling AQ

V2/DDH 3
Coord 10 000 N 10175 E
Brg 090° TN
Dip −60°
Depth 0 − 1·5m auger precollar
1·5m − 42·0m Diamond Drilling AQ

Voyager 2 / DDH2
Coord 10000 N 9815 E
Brg 090° TN
Dip −60°
Depth 0 − 1·4m auger pre-collar
1·4m − 47·0m Diamond Drilling AQ

5245000N

5245000N

V2 DDH 4
Coord 9630N 10000E
Brg 090° TN
Dip −60°
Depth 0-0·2m auger pre-collar
0·2m 30·7m Diamond Drilling AQ

Voyager 10 Prospect

5244000N

5244000N

384000E

385000E

075057

5 cm

LEGEND:

1 For details of abbreviations used for geological interpretations refer to appendix No.7

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD

SCALE: 1:5000

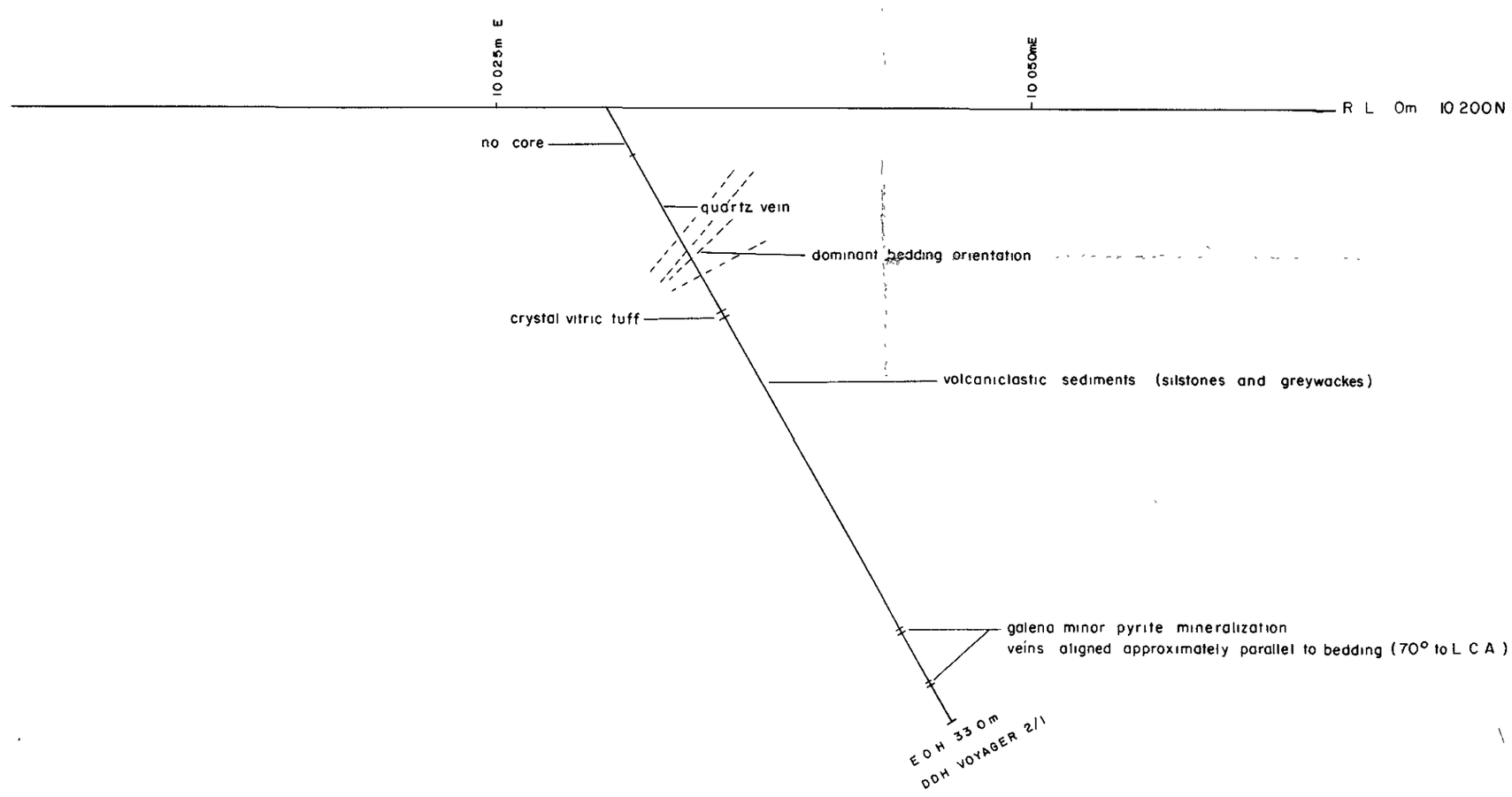
No. KT 27/76 -V2-2

E.L. 27/76 ELLIOTT BAY, TASMANIA
VOYAGER 2
GEOLOGICAL INTERPRETATION
Showing Diamond Drill Hole Locations

001

DATE MAY 1980
GEOLOGIST C.D.S.
DRAWN J.P.M.
CHECKED C.D.S.

80-1448



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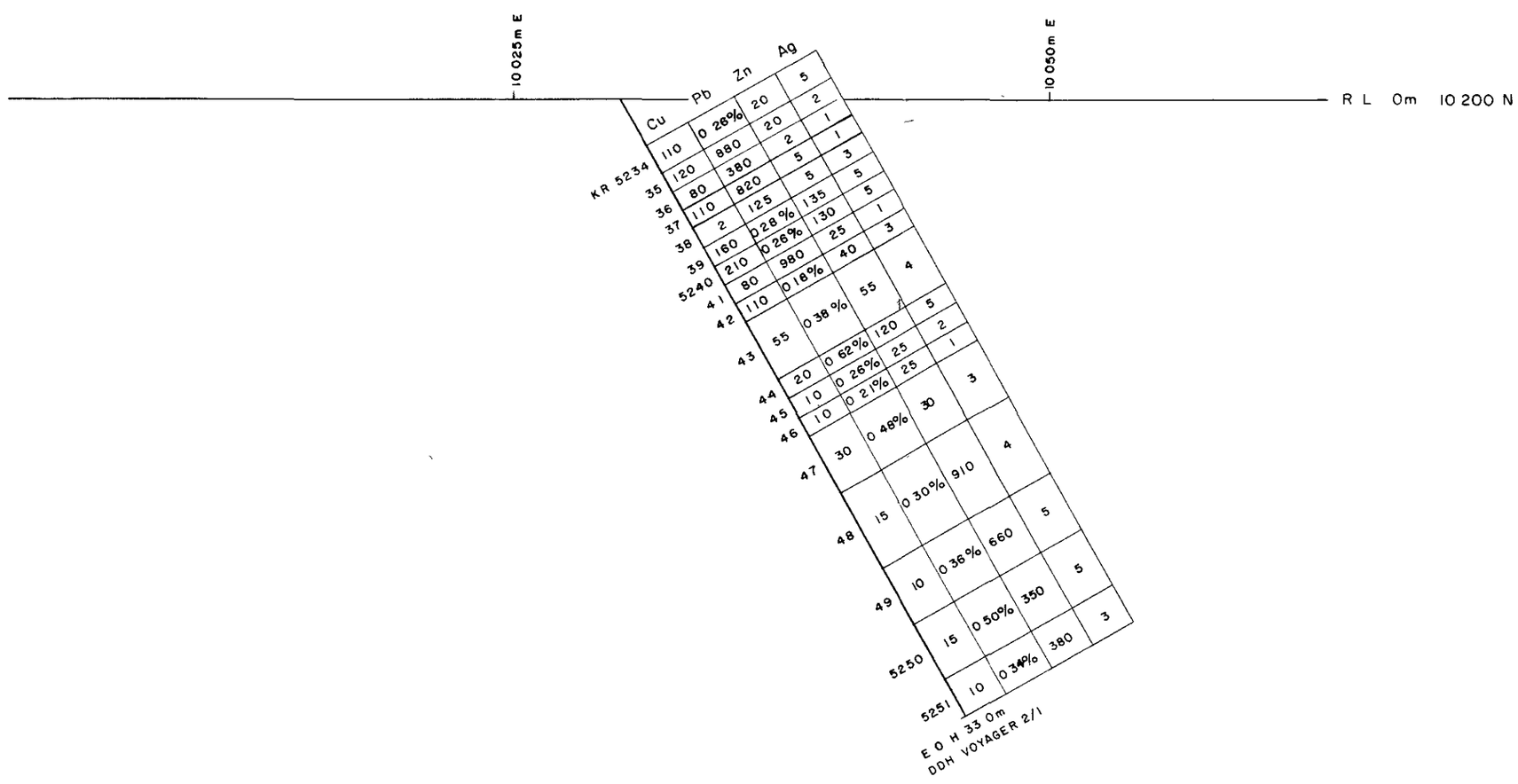


5 cm

GEOCHEMICAL RESULTS

075058

LEGEND

ANALYTICAL METHODS

Cu, Pb, Zn, Ag – AAS (method 1)
Ba* XRF (method 9a)
Au* AAS - CARBON ROD (method 120a)
Sn*, W* XRF (method 9a)

* where applicable

Australian Laboratory Services – Brisbane QLD

UNITS

Cu, Pb, Zn, Ag, Ba, Sn, W — ppm
Au — ppb
(unless otherwise stated)

DATE NOV '79
GEOL CDS
DRAWN JPM
CDS

GEOPEKO
TASMANIA

1 250

No TS 27/76 V2-9

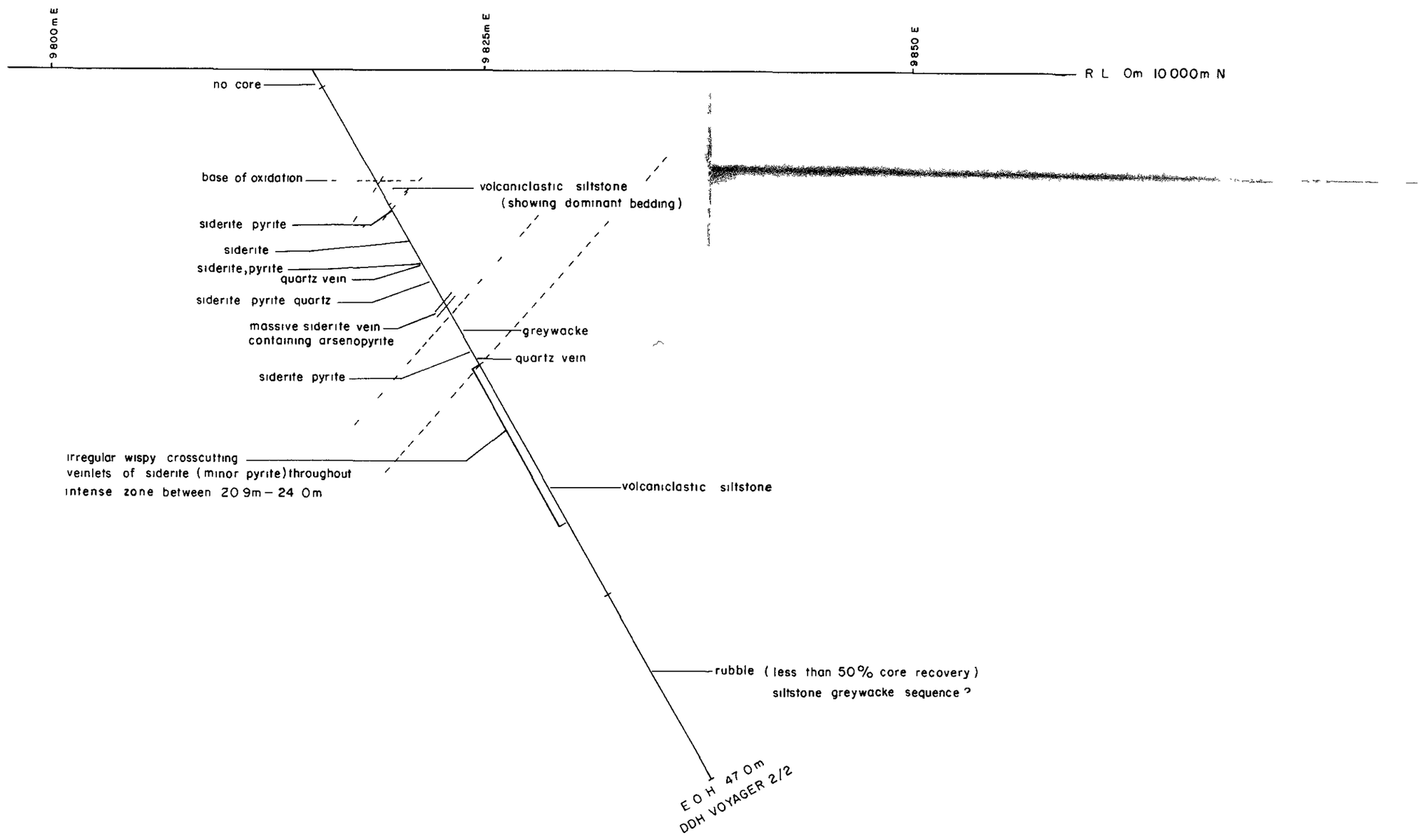
E.L. 27/76 ELLIOTT BAY, TASMANIA

VOYAGER 2 DDH 1

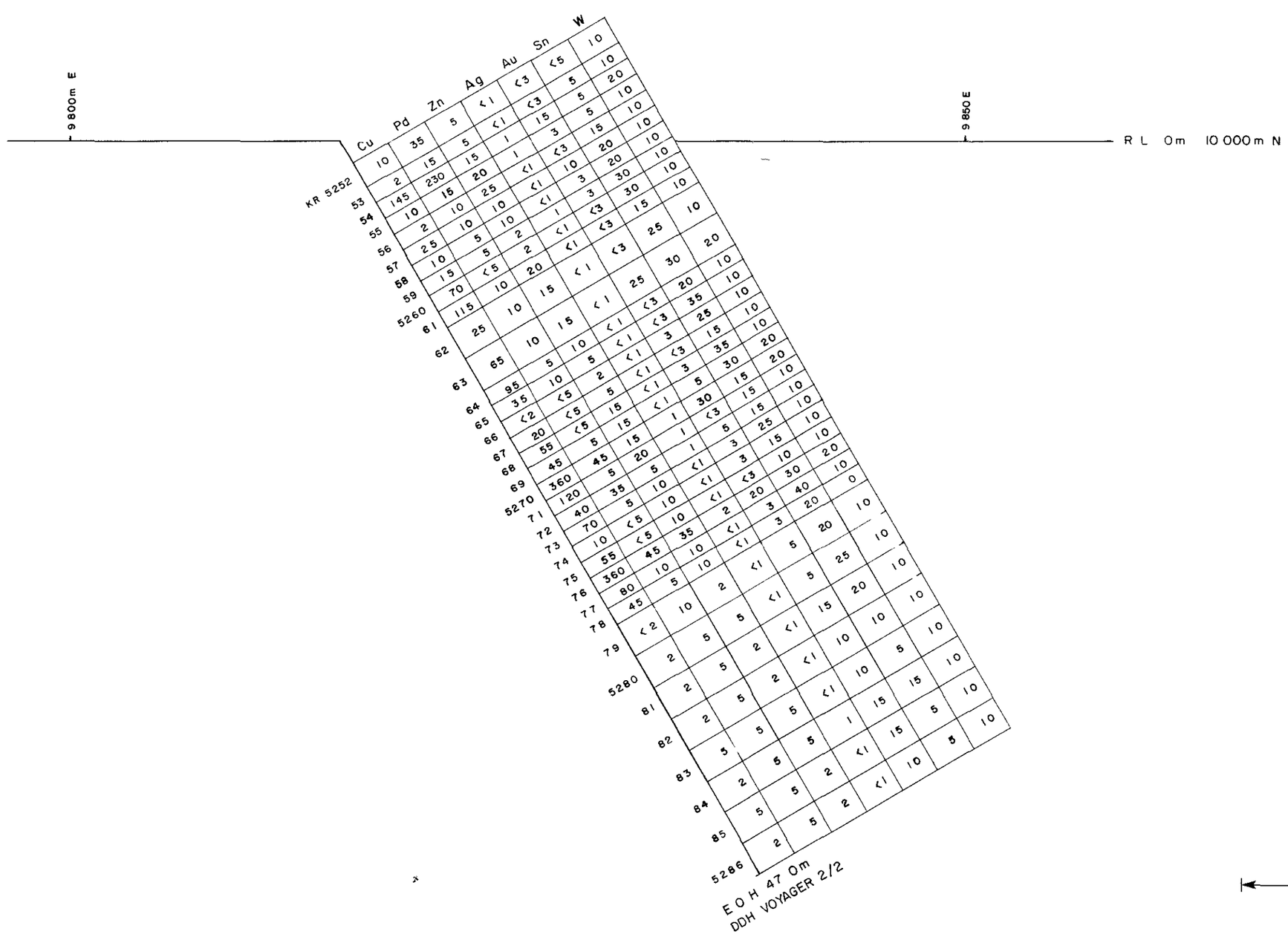
002

GEOLOGICAL/GEOCHEMICAL SUMMARY

80-K48



GEOLOGICAL LOG



KR 5252	Cu	Pd	Zn	Ag	Au	Sn	W
53	10	35	5	<1	<3	<5	10
54	2	15	5	<1	<3	5	10
55	145	230	15	1	15	5	20
56	10	15	20	1	3	5	10
57	2	10	25	<1	<3	15	10
58	25	10	10	<1	10	20	10
59	10	5	10	<1	3	20	10
5260	15	<5	2	1	3	30	10
61	70	10	2	<1	<3	30	10
62	115	20	20	<1	<3	15	10
63	25	10	15	<1	<3	25	10
64	65	10	15	<1	<3	30	20
65	95	5	10	<1	<3	20	10
66	35	10	5	<1	3	35	10
67	<2	<5	2	<1	<3	25	10
68	20	<5	5	<1	3	15	10
69	55	<5	15	<1	<3	35	20
5270	45	5	15	1	5	30	20
71	360	45	15	1	30	15	10
72	120	5	20	1	<3	15	10
73	40	35	5	1	5	15	10
74	70	5	10	<1	3	25	10
75	10	<5	10	<1	3	15	10
76	55	<5	35	2	<3	10	20
77	360	45	10	<1	20	30	10
78	80	10	10	<1	3	40	0
79	45	5	10	<1	3	20	10
5280	<2	10	2	<1	5	20	10
81	2	5	5	<1	5	25	10
82	2	5	2	<1	15	20	10
83	2	5	2	<1	10	10	10
84	5	5	5	<1	10	5	10
85	2	5	5	1	15	15	10
5286	2	5	2	<1	15	5	10
		5	2	<1	10	5	10

C75059

5 cm

GEOCHEMICAL RESULTS

LEGEND

ANALYTICAL METHODS
Cu, Pb Zn Ag – AAS (method 1)
Ba* XRF (method 9a)
Au* AAS - CARBON ROD (method 120a)
Sn* W* XRF (method 9a)
* where applicable

Australian Laboratory Services – Brisbane QLD

UNITS
Cu Pb Zn Ag Ba Sn, W — ppm
Au — ppb
(unless otherwise stated)

DATE	NOV 79
	C D S.
	J P M
	CDS

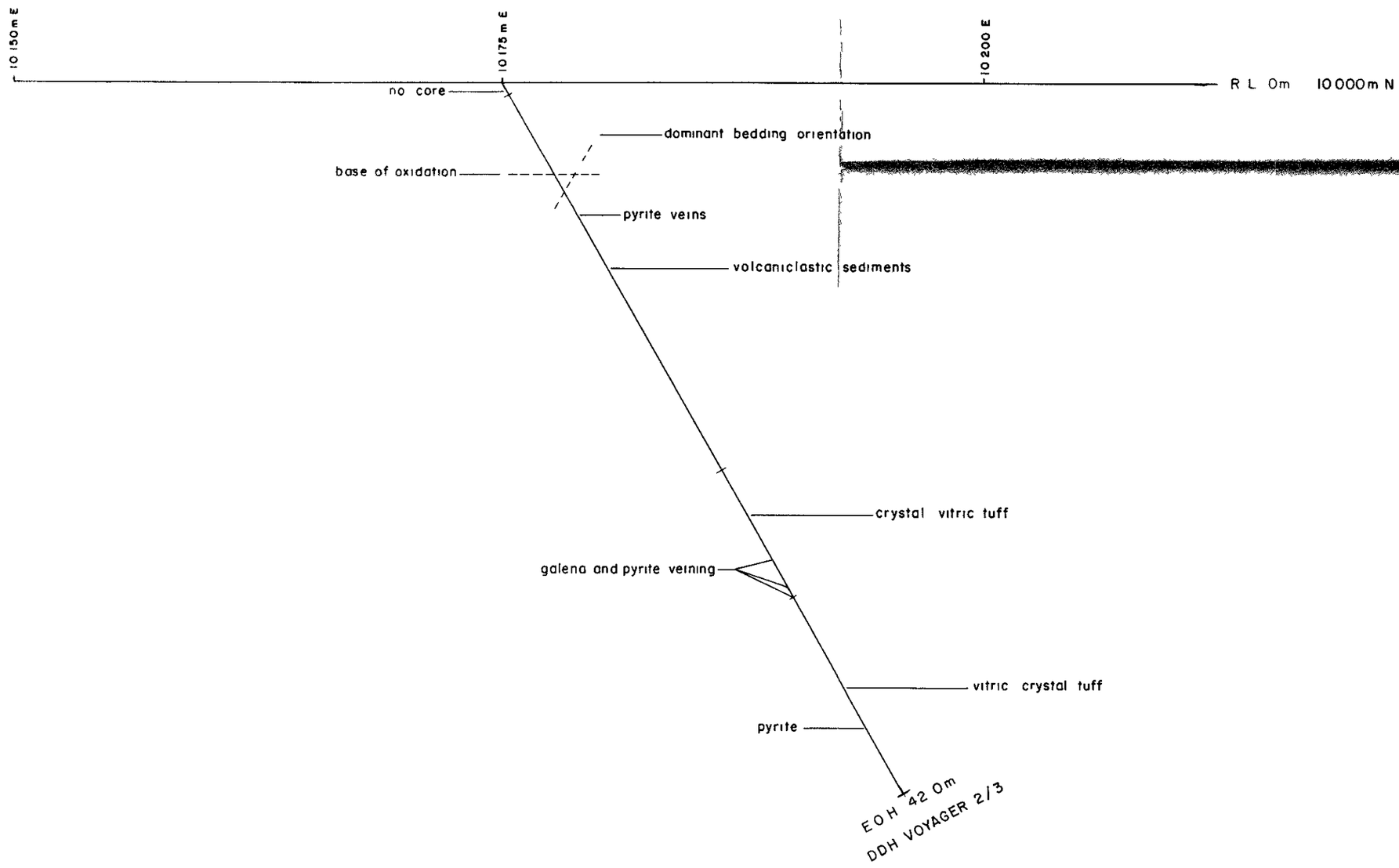
E ... KO
... ASMANIA
1 250
No TS 27/76-V2-10

E L 27/76 ELLIOTT BAY, TASMANIA

VOYAGER 2 DDH 2 003

GEOLOGICAL/GEOCHEMICAL SUMMARY

80-1448



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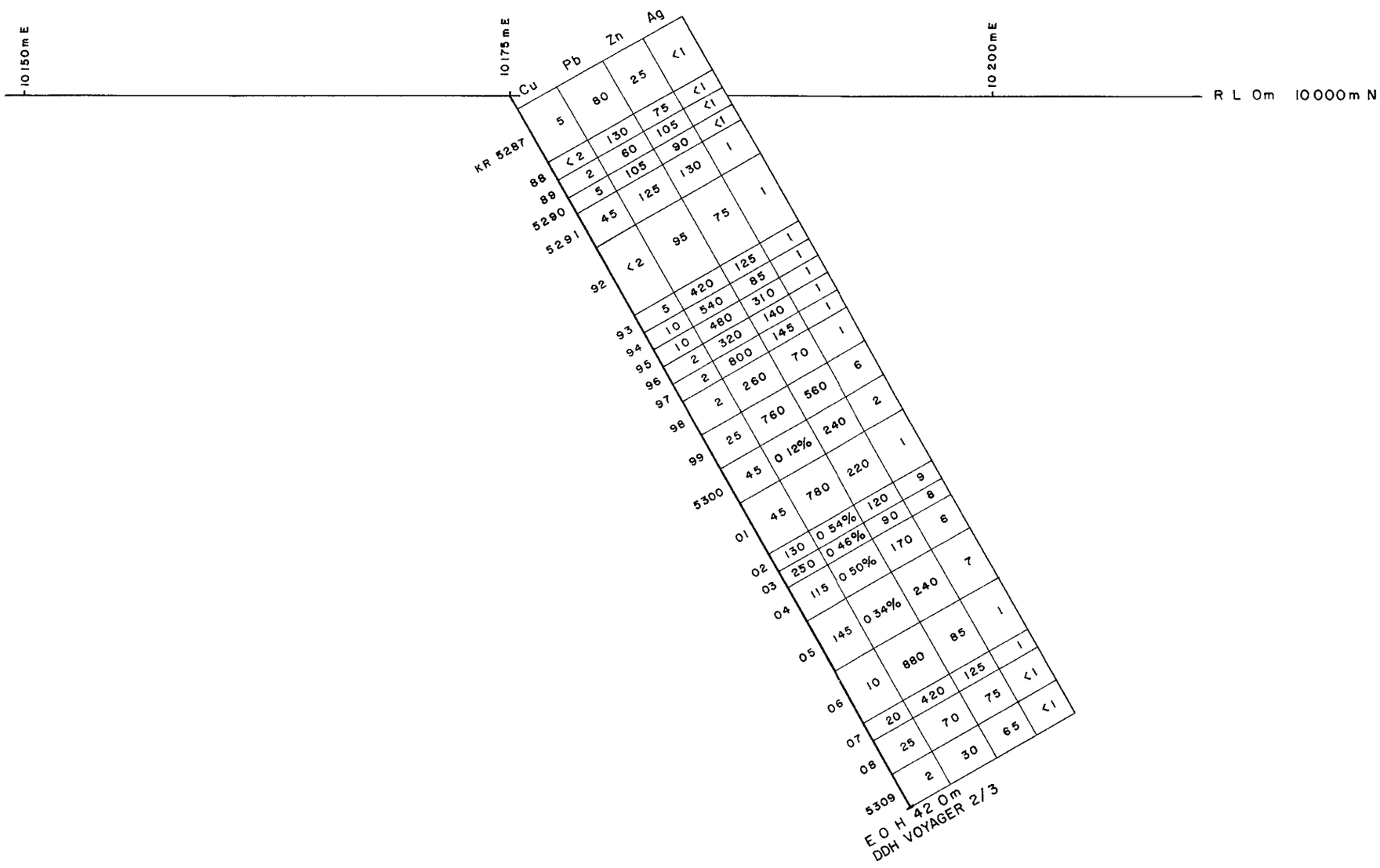


075060

5 cm

GEOCHEMICAL RESULTS

LEGEND

ANALYTICAL METHODS

Cu, Pb, Zn Ag — AAS (method 1)
Ba* XRF (method 9a)
Au* AAS - CARBON ROD (method 120a)
Sn* W* XRF (method 9a)

* where applicable

Australian Laboratory Services — Brisbane QLD

UNITS

Cu Pb Zn, Ag, Ba Sn, W — ppm
Au — ppb
(unless otherwise stated)

DATE NOV 79
GEOLOGIST C D S
DRAWN J P M
REVISED CDS

GEOPEKO
DEVONPORT BASE, TASMANIA

SCALE 1 250

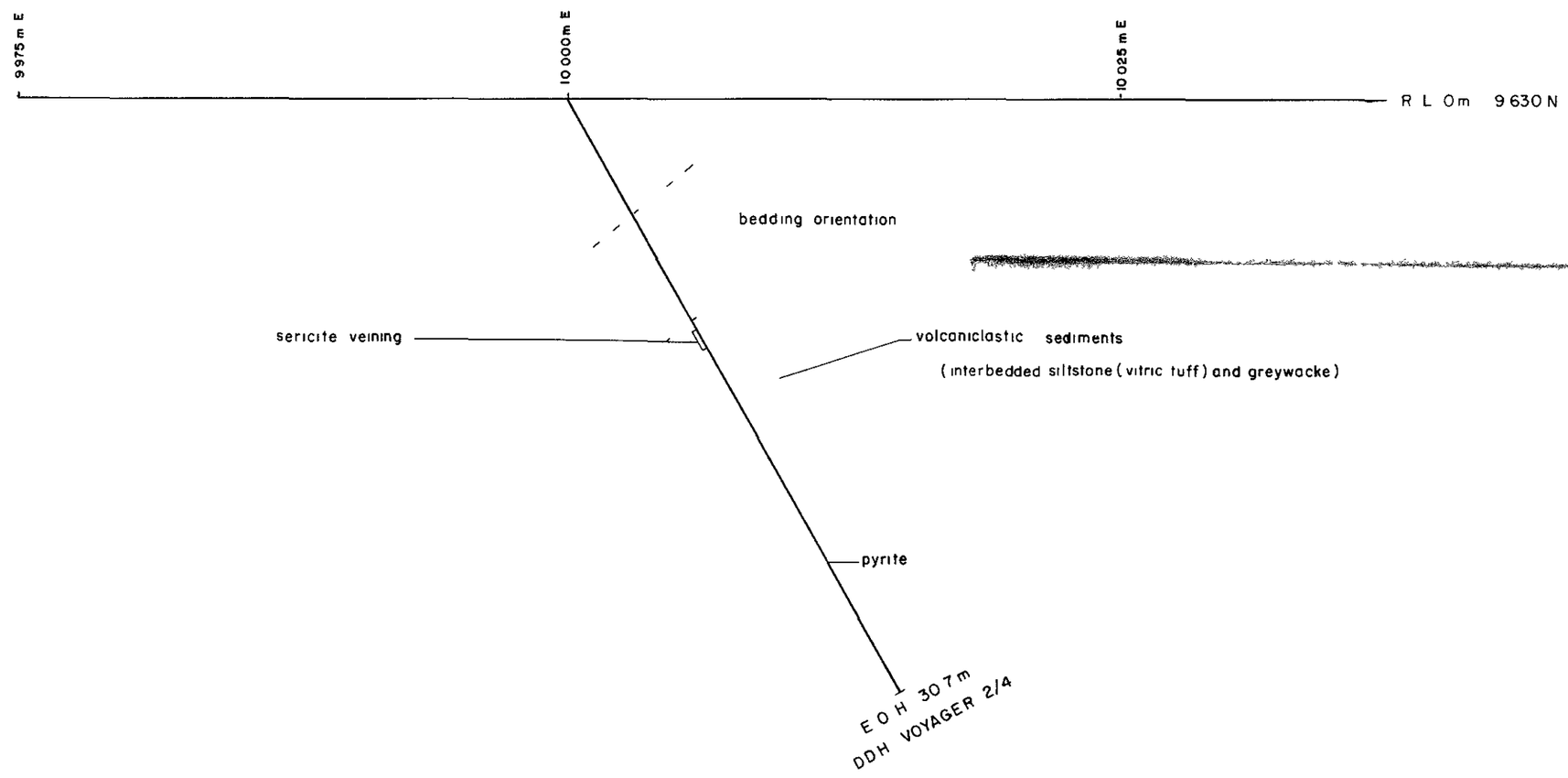
No TS 27/76-V2-11

E L 27/76 ELLIOTT BAY, TASMANIA

VOYAGER 2 DDH 3 004

GEOLOGICAL/GEOCHEMICAL SUMMARY

80-1448



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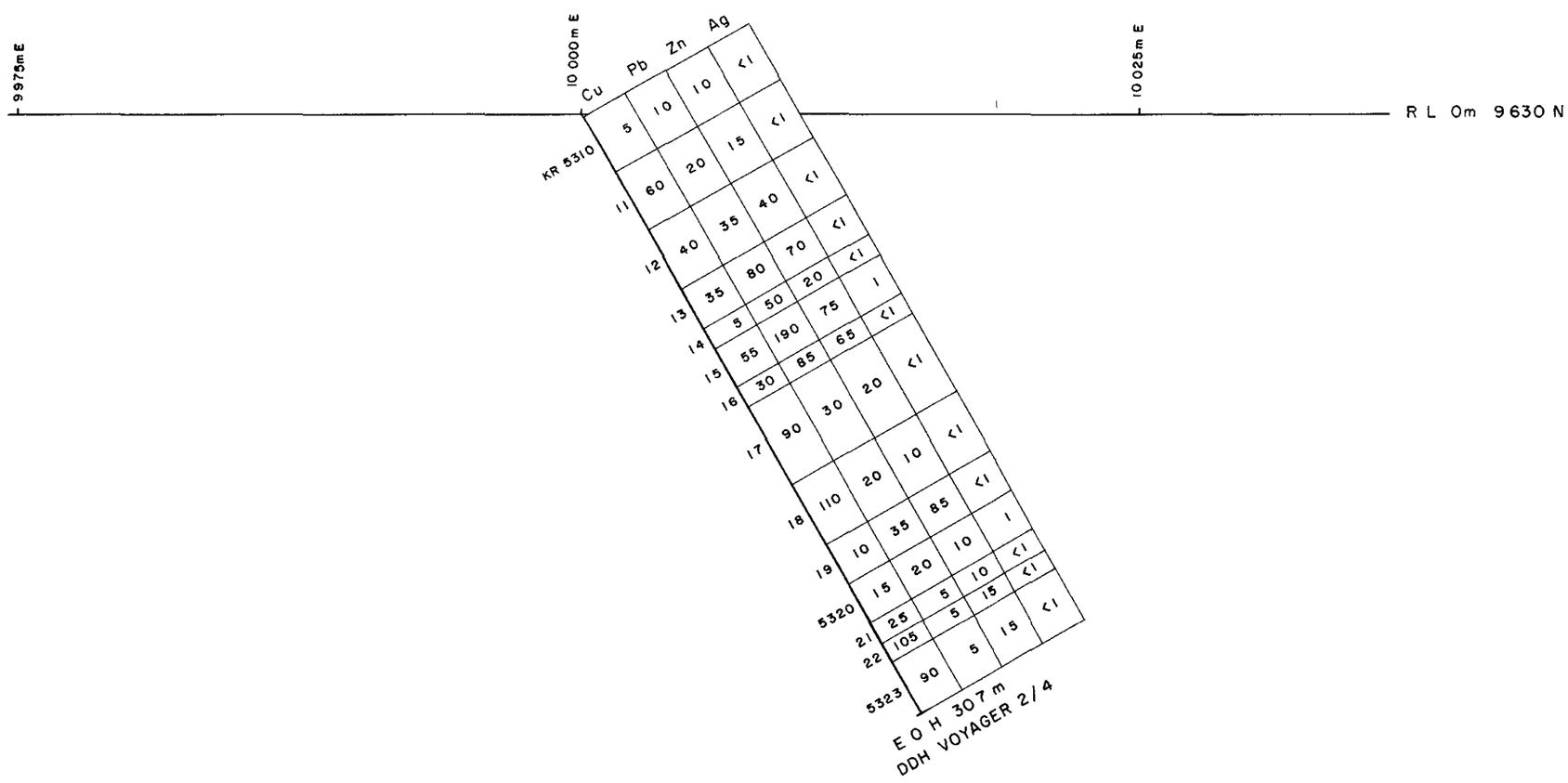


075061

5 cm

GEOCHEMICAL RESULTS

LEGEND

ANALYTICAL METHODS

Cu Pb, Zn Ag — AAS (method 1)
Ba* XRF (method 9a)
Au* AAS - CARBON ROD (method 120a)
Sn* W* XRF (method 9a)

* where applicable

Australian Laboratory Services — Brisbane QLD

UNITS

Cu Pb Zn, Ag Ba Sn, W — ppm
Au — ppb
(unless otherwise stated)

DATE NOV 79
GEOLOGY S C D S
DRAWN J P M

GEOPEKO
DEVONPORT BASE TASMANIA

S E T 250

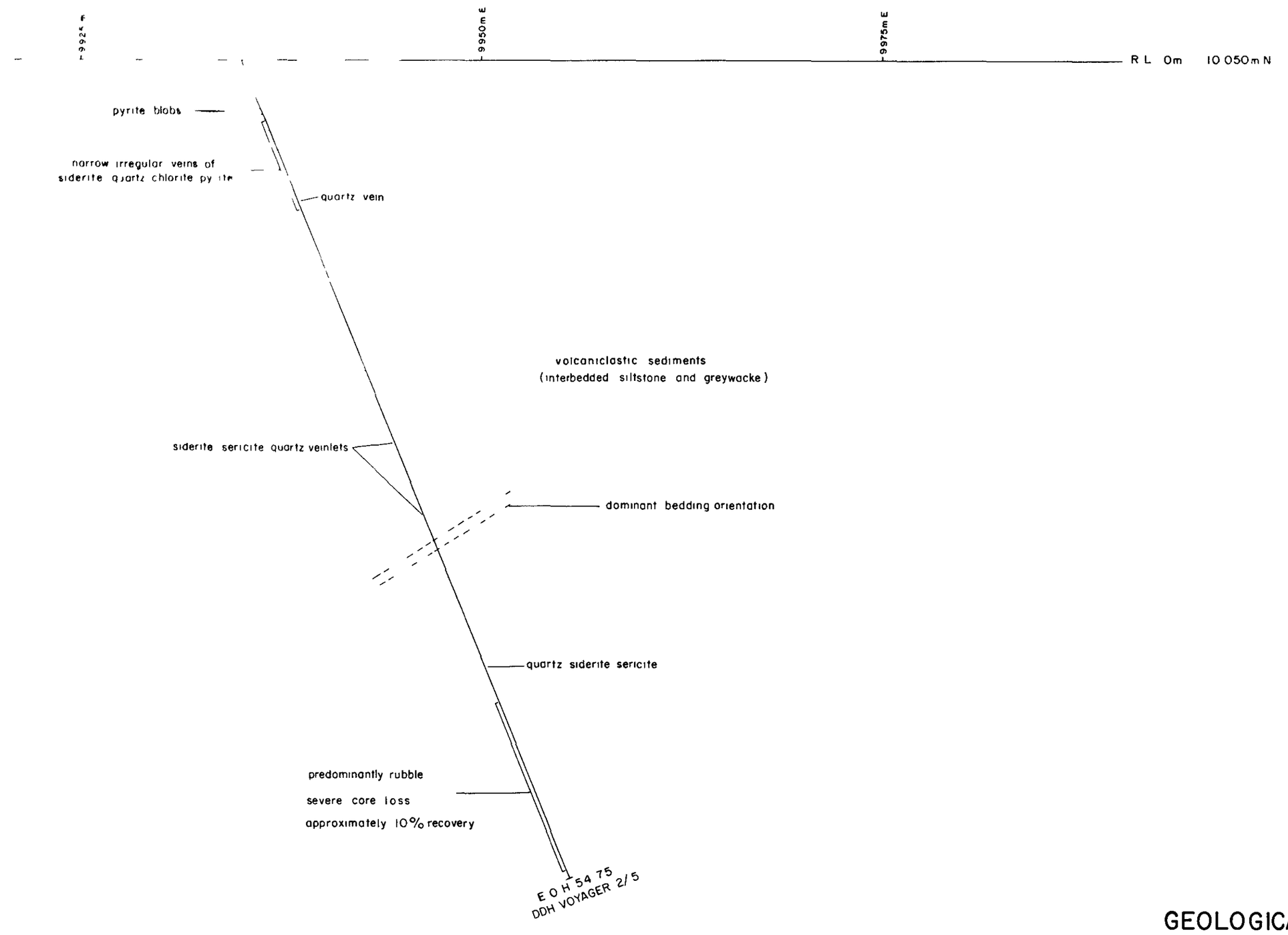
No TS27/76-V2-12

E L 27/76 ELLIOTT BAY, TASMANIA

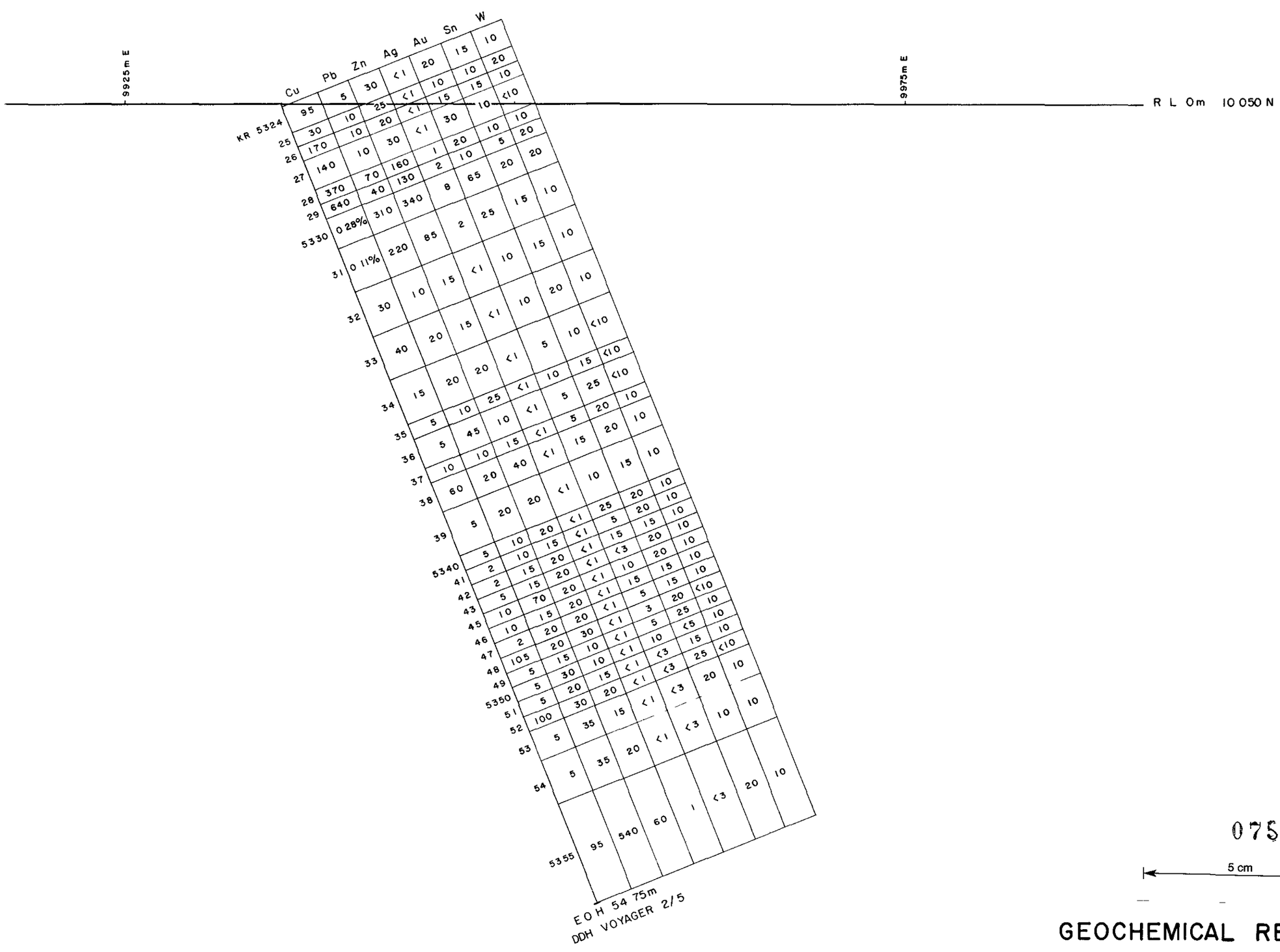
VOYAGER 2 DDH 4 0 005

GEOLOGICAL/GEOCHEMICAL SUMMARY

80-1448



GEOLOGICAL LOG



075062

5 cm

GEOCHEMICAL RESULTS

LEGEND

ANALYTICAL METHODS
Cu Pb Zn Ag — AAS (method 1)
Ba* XRF (method 9a)
Au* AAS - CARBON ROD (method 120a)
Sn* W* XRF (method 9a)
* where applicable
Australian Laboratory Services — Brisbane QLD

UNITS
Cu Pb Zn Ag Ba Sn W — ppm
Au — ppb
(unless otherwise stated)

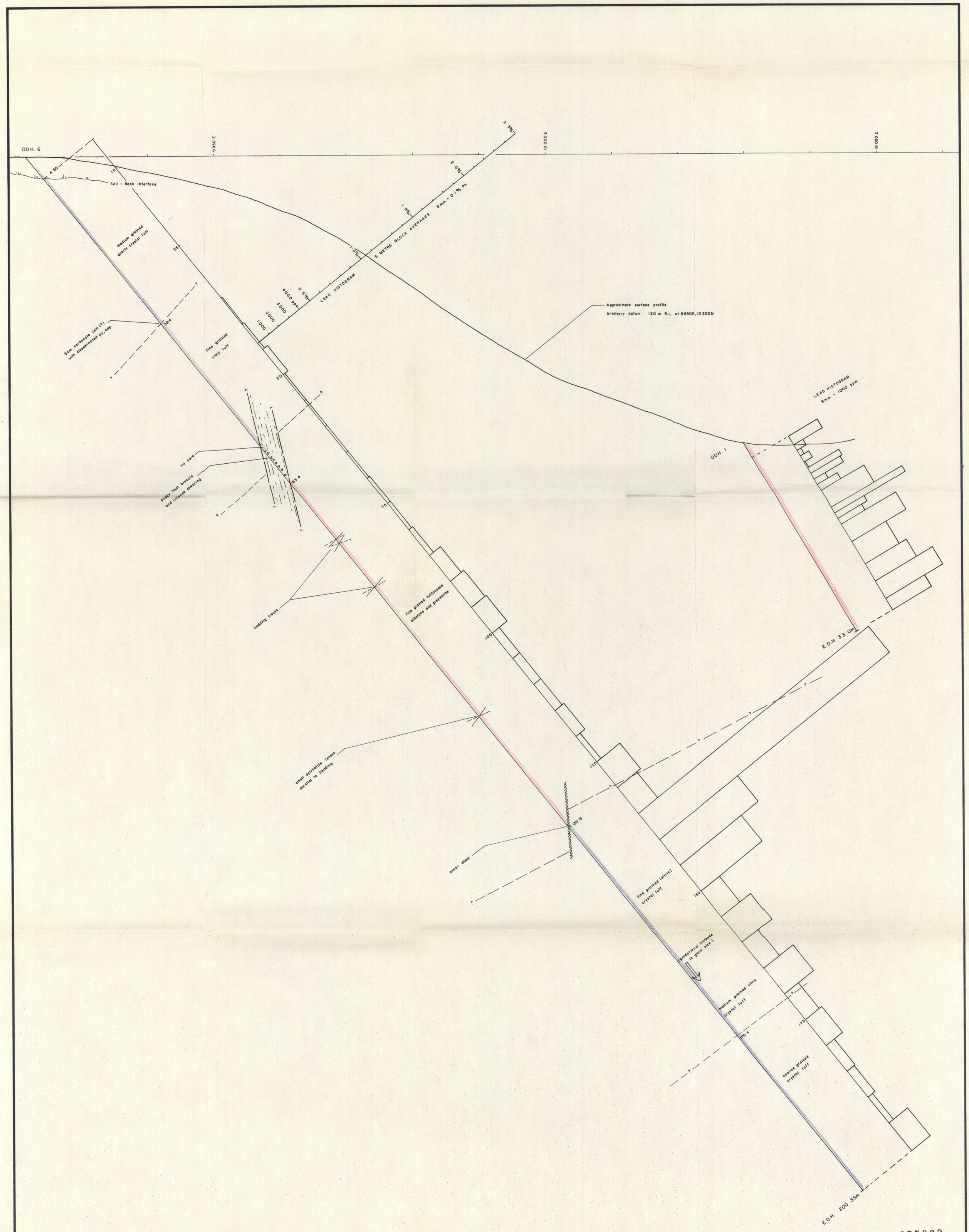
DATE NOV 79
CDS
JPM

GEOPEKO
DEVONPORT TASMANIA
No TS27/76 V2-13

E L 27/76 ELLIOTT BAY, TASMANIA

VOYAGER 2 DDH 5 006

GEOLOGICAL/GEOCHEMICAL SUMMARY



GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD

SCALE 1:250

No. TS 27/76-V2-14

E.L. 27/76 ELLIOTT BAY, TASMANIA

VOYAGER 2 007

GEOLOGICAL CROSS SECTION 10 200 N

DDH 6 & DDH 1

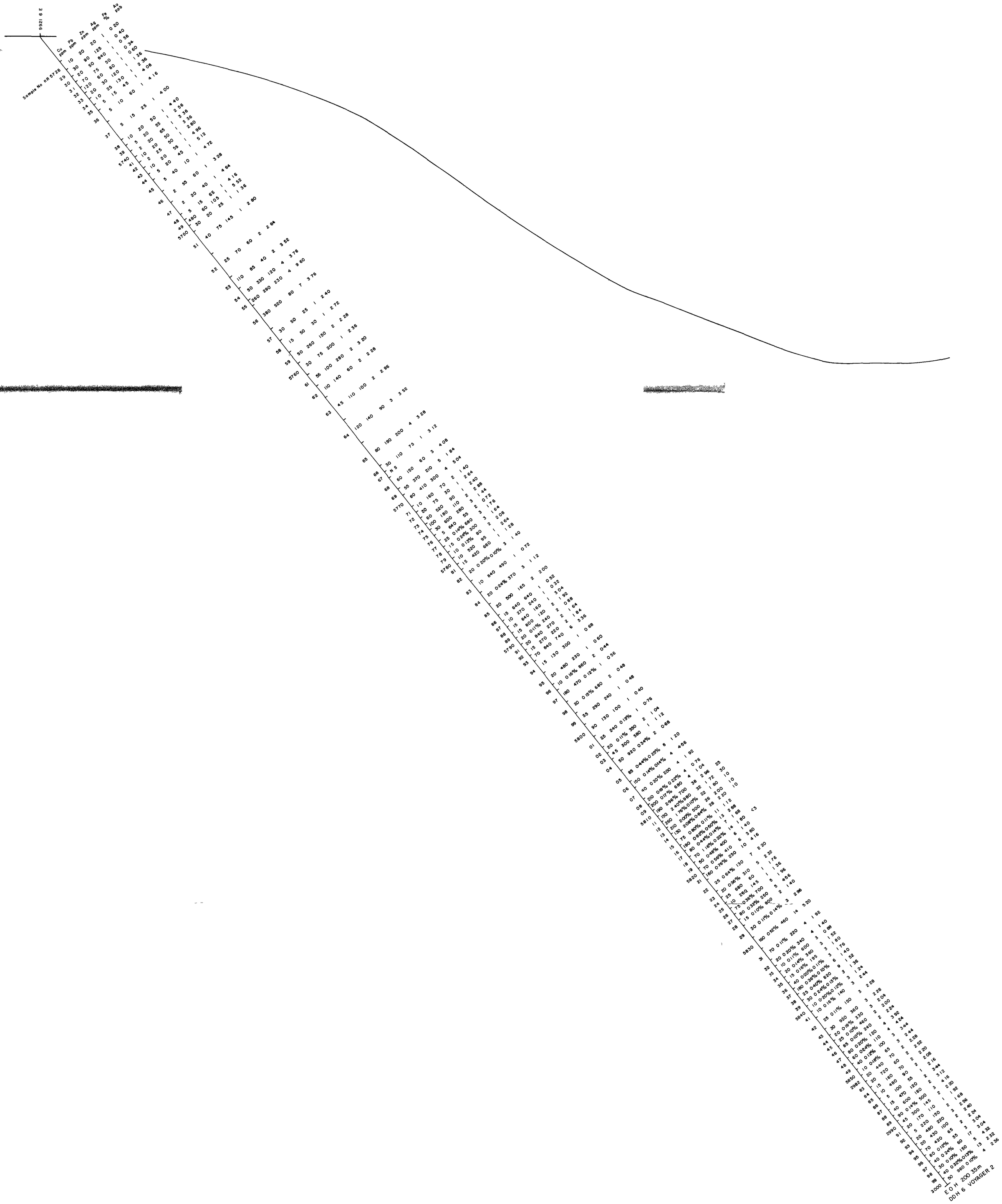
DATE JUNE 1980

GEOLOGIST W. H.

DRAWN J. P. M.

CHECKED

80 1448



075064

5 cm

LEGEND

ANALYTICAL METHODS

Cu Pb, Zn Ag – AAS (method 1)
Ba* XRF (method 9a)
Au* AAS – CARBON ROD (method 120a)
Sn* W* XRF (method 9a)

* where applicable

Australian Laboratory Services – Brisbane QLD

GEOPEKO
DEVONPORT BASE, TASMANIA

SCALE 1 250

No TS 27/76 V2-15

E L 27/76 ELLIOTT BAY, TASMANIA

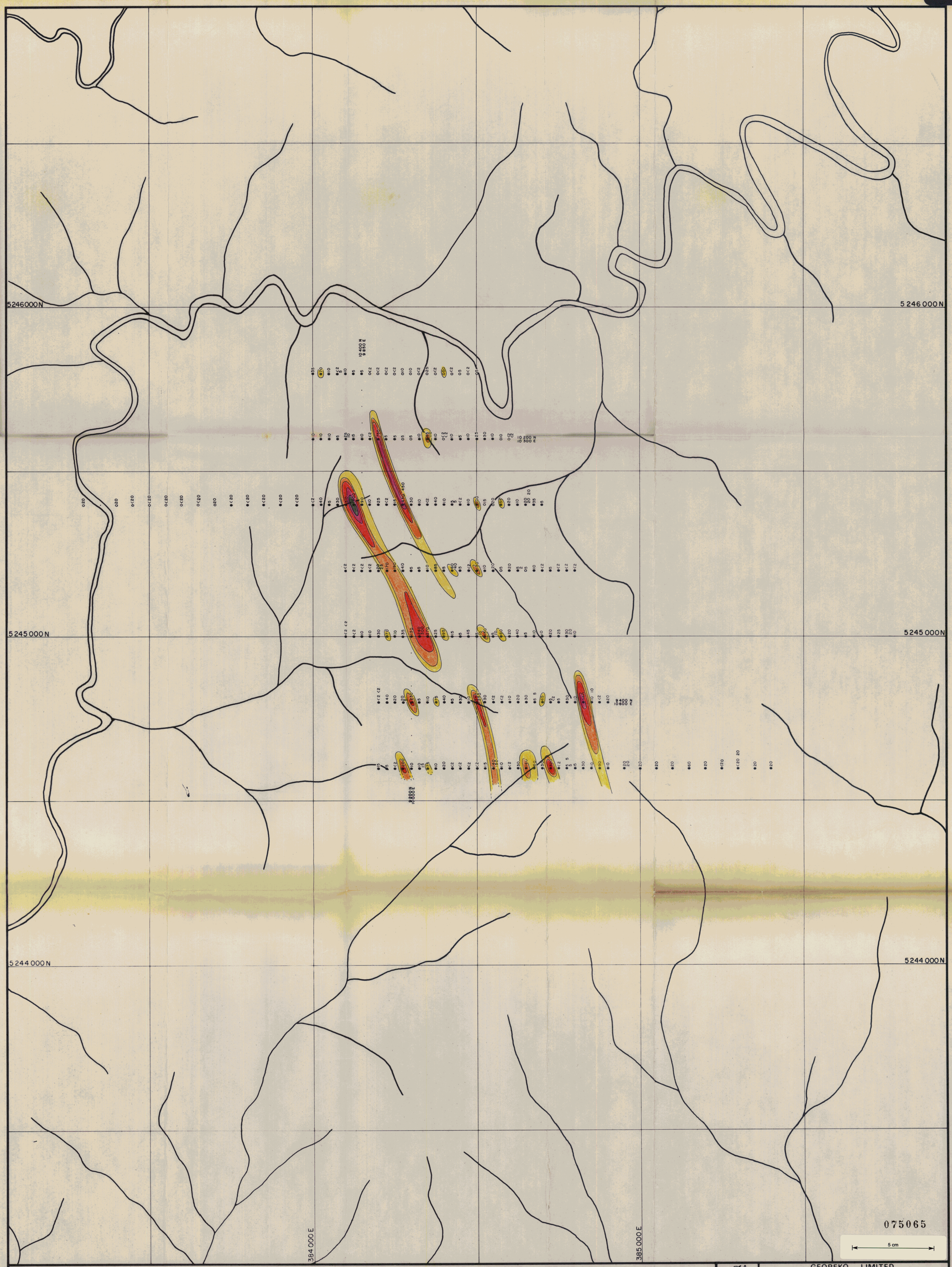
VOYAGER 2
DDH 6

008

GEOCHEMICAL PROFILE

DATE MAY 1980
GEOLOGIST C.D.S. W.H.
DRAWN J.P.M.
CHECKED CDS

80-1448



LEGEND:
- ● Power auger
- o Hand auger
- · Grid position

020 — 20 ppm Cu original sample
20 20 — 20 ppm Cu repeat and check duplicate
20 ppm Cu duplicate sample

ANALYTICAL METHODS
Cu by AAS following hot conc HCL and HCL/HNO3 leach in latter stages for 1 hour of 0.25g sample

CONTOUR INTERVAL

Pencil No	
19-6	50 - 100 ppm
19-10	100 - 200 ppm
19-15	200 - 400 ppm
19-22	400 - 800 ppm
19-50	800 - 1600 ppm

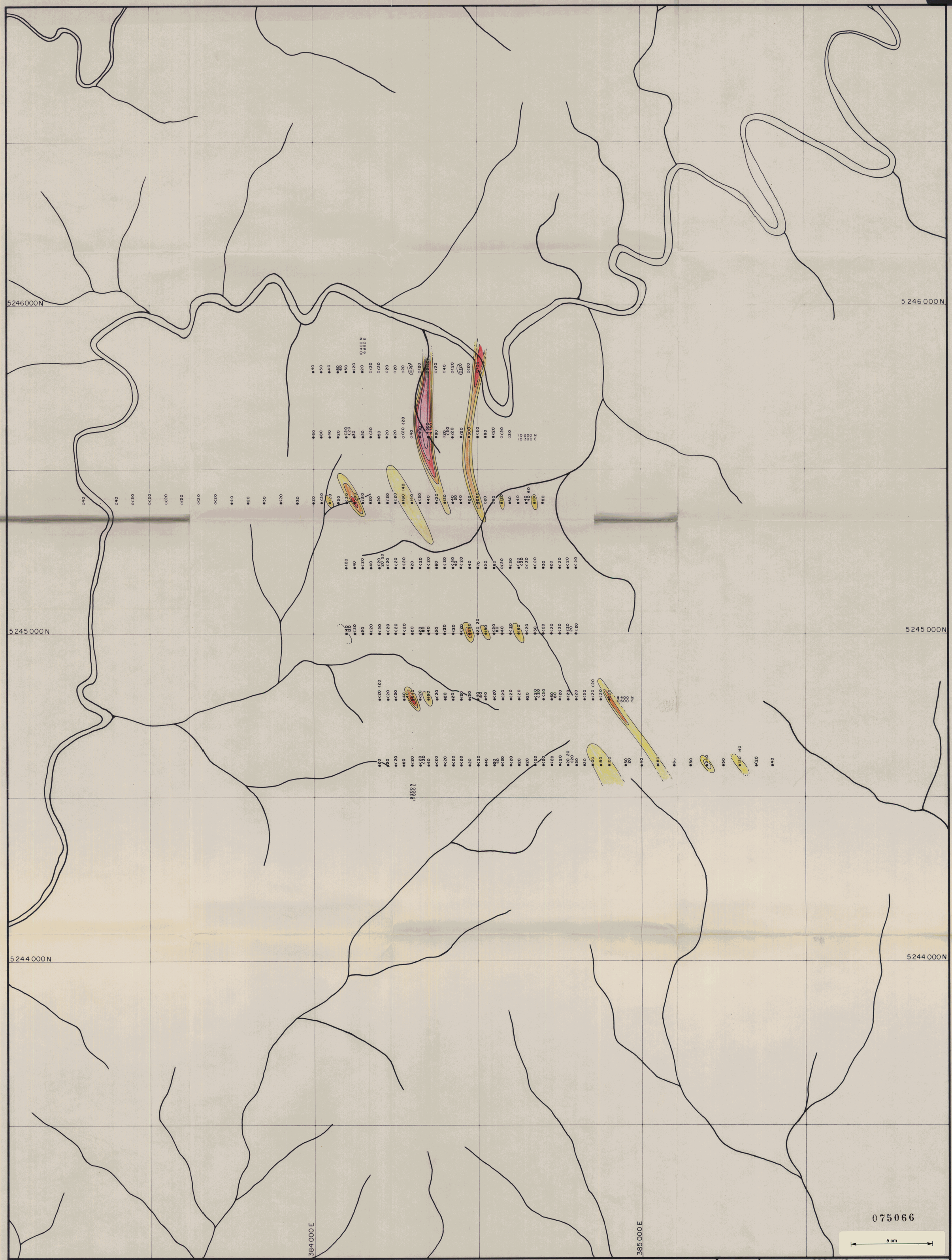
NOTE:
This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15 840 scale topographic machine plots.

DATE: 6-'78; 11-'79
GEOLOGIST: C.D.S.
DRAWN: J.P.M.
CHECKED: CDS

GEOPEKO LIMITED
KING ISLAND GROUP
SCALE: 1:5000
No. KT 27/76-V2-3

E.L. 27/76 ELLIOTT BAY, TASMANIA
VOYAGER 2
C-HORIZON GEOCHEMICAL RESULTS
COPPER CONTOURS
009

80-1668



LEGEND

- ● Power auger
- o Hand auger
- · Grid position

●40 — 40 ppm Pb original sample.
40 60 — 60 ppm Pb repeat and check duplicate sample.
— 40 ppm Pb duplicate sample.

ANALYTICAL METHODS

Pb by AAS following hot conc. HCL and HCL/HNO_3 leach in latter stages for 1 hour of 0.25g sample.

CONTOUR INTERVAL

Pencil No.	
19-6	100-200 ppm
19-10	200-400 ppm
19-15	400-800 ppm
19-22	800-1600ppm
19-50	> 1600 ppm

NOTE

This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15 840 scale topographic machine plots.

DATE 6-78+ 11-79
GEOLOGIST C.D.S.
DRAWN J.P.M.
CHECKED C.D.S.

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE 1:5000

No. KT 27/76-V2-4

E.L. 27/76 ELLIOTT BAY, TASMANIA
VOYAGER 2
C- HORIZON GEOCHEMICAL RESULTS
LEAD CONTOURS

010

80-1448

LEGEND

- ● Power auger
- o Hand auger
- · Grid position

●65 / 55 60 — 65 ppm Zn original sample. 60 ppm Zn repeat and check duplicate sample. 55 ppm Zn duplicate sample.

ANALYTICAL METHODS:

Zn by AAS following hot conc. HCL and HCL/HNO3 leach in latter stages for 1 hour of 0·25g sample.

CONTOUR INTERVAL

Pencil No.	
19-6	100 - 200 ppm
19-10	200 - 400 ppm
19-15	400 - 800 ppm
19-22	800 - 1600 ppm
19-50	> 1600 ppm

NOTE

This map has been compiled from enlargements of the Tasmanian Lands Departments 1:15 840 scale topographic machine plots

DATE 6-'78 + 11-'79
GEOLOGIST C D S
DRAWN J P M
CHECKED CDS

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE 1:5000

No KT 27/76 V2-5

E L 27/76 ELLIOTT BAY, TASMANIA
VOYAGER 2
C- HORIZON GEOCHEMICAL RESULTS
ZINC CONTOURS

011

80-1648