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ABERFOYLE MANAGEMENT PTY. LTD.

PROGRESS REPORT NO. 1 ON EXPLORATION AT  
THE GREAT PYRAMID, N.E. TASMANIA

R. J. Varley,

Geologist.

14 August, 1970.

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SUMMARY

This report covers an exploration programme which was initiated at the Great Pyramid Prospect near Scamander, Tasmania, to investigate the open cut potential of tin mineralisation known to occur on three mineral leases held by the Lloyd Price syndicate.

The programme consisted of geochemical soil sampling and percussion drill sampling along a closely spaced grid, together with geological mapping of all available outcrops and mine workings.

Several zones of tin mineralisation were defined and the overall structures and lithology of the area outlined.

Further investigations are needed to establish fully the extent of mineralisation both laterally and at depth so that the full potential of the area can be determined.

CONCLUSIONS

1. There are two main zones of tin mineralisation, both associated with synclinal structures.
2. The Brocks Shaft area contains tin-copper mineralisation of lesser importance.
3. The mineralisation of all these zones is irregular in distribution.
4. The tin mineralisation is associated mainly with quartzites.
5. The tin mineralisation occurs in fissures best developed in areas of faulting and folding.
6. A major tension zone appears to exist, limiting mineralisation to the north.
7. Ore reserves are being calculated. (See Appendix III).
8. The depth of mineralisation in the host rocks is not fully known (refer Drawing GPY-080).
9. Areas of potential mineralisation are yet untested within the lease boundaries (see Drawing GPY-052).
10. Areas of potential tin mineralisation may occur beyond the lease boundaries (see Drawing GPY-052).

RECOMMENDATIONS

1. Test at depth for mineralisation along both strike and dip in the two main mineralised zones.
2. That percussion drill results be followed in depth by diamond drilling.
3. Possible lateral extensions of the south-west mineralised zone within the lease boundaries be tested (see Drawing GPY-052).
4. Investigate avenues to acquire exploration rights to test the potential for mineralisation beyond the lease boundaries.
5. Drill samples be re-assayed for Cu along line 8N from 1.5E to 3.5E inclusive and line 9N from 1.5E to 3.5E inclusive.
6. If these re-assays prove promising, then all other lines north-west of and including 6N be re-assayed.

INTRODUCTION

The Great Pyramid Prospect is situated 7 miles west of Scamander in N.E. Tasmania and approximately 2 miles north of the Upper Scamander bridge. Leases over the area total 48 acres and are held under option to purchase by Paringa Mining and Exploration Company Limited. The area has been investigated by several interested parties since the discovery of tin in 1909. The early methods of investigation were trenching, costeaning, shaft sinking, driving and cross-cutting. More recently, geological surveys and drilling programmes were used. An intensive exploration programme has since been completed in the area on behalf of Paringa Mining and Exploration Company Limited. It included gridding, geochemical sampling, geological mapping and percussion drilling.

PREVIOUS WORK

Workings in the area were sampled systematically in 1914 to confirm values obtained initially in 1910-11. During the period 1925 to 1936, some actual mining and milling operations were carried out, realising about 331 tons of ore at an estimated recovery grade of 0.88% Sn. In 1957, high grade areas were checked by the Tasmanian Mines Department. The sampling and concurrent geological surveys confirmed the presence of several high grade tin areas as well as indicating structural and lithological controls on the localisation of mineralisation. Work in 1964-65 by B.H.P. consisted of geological mapping, a magnetometer survey, the drilling of 23 percussion holes and one diamond drill hole. B.H.P.'s objectives were to locate and investigate areas of cassiterite-sulphide mineralisation. The results obtained indicated the scattered nature of mineralisation and its presence at depth. B.H.P. relinquished the area since tonnages and grades were considered to fall below that company's requirements.

EXPLORATION ACTIVITIES

These commenced late in 1969 and comprised:

1. Establishing a base line OOE trending  $140^{\circ}$  -  $320^{\circ}$  magnetic.
  2. Layout of traverse lines 6S to 11N at 100' intervals at right angles to the base line. Trend of lines is  $50^{\circ}$  -  $230^{\circ}$  magnetic. Both (1) and (2) were done by compass and tape methods.
  3. Pegging of traverse lines at 50' intervals.
  4. A limited geochemical soil sampling programme on lines 3N to 11N, which followed an orientation survey.
  5. Construction of access roads to selected grid points, using a contractor's bulldozer.
  6. Completion of 137 percussion drill holes giving a total of 16,485 feet for 2,951 samples which were assayed for tin.
  7. Mapping of surface and underground geological features and lithological logging of drill chips.
  8. Compilation of the following drawings:
 

(a) Drilling grid and mineralised areas.	1" : 100'	GPY-052
(b) Access Roads	1" : 100'	GPY-029-G
(c) Surface geology fact	1" : 100'	GPY-053
(d) Surface geology interpretation	1" : 100'	GPY-054
(e) Underground geology fact	1" : 100'	GPY-055
(f) Geochemical results, Sn	1" : 100'	GPY-050
(g) Geochemical results, Cu	1" : 100'	GPY-051
(h) Geological cross-sections: fact	1" : 40'	GPY-056-073
(j) Geological cross-sections: assay data	1" : 40'	GPY-074-091
(k) Geological cross-sections: ore reserves	1" : 40'	GPY-092-094
- These drawings are held in Head Office files.
9. All residue samples from drilling were stored at Rossarden for subsequent test work.
  10. All drill holes were pegged and marked in the field.

GEOLOGY

The host rocks for mineralisation belong to the Mathinna Group of Siluro-Devonian age. These sediments can loosely be divided into three groups; shales, quartzose rocks and quartzites. The general strike of these rocks is NW-SE with variable dips.

The shaley rocks consist of mudstones, siltstones and slates; these are generally thin bedded with individual laminae varying in thickness from an inch to a few feet. They form the non-competent member of the sequence exhibiting shearing, lensing and locally pinch and swell along strike.

The quartzose rocks are fine to medium grained sandstones (often feldspathic) and quartzitic shales. They are poorly bedded and blocky to massive in appearance. They form a gradation between the shales and quartzites often with indistinguishable boundaries.

The quartzites are medium grained, hard, massive with no apparent bedding. Colour variations within the quartzites may reflect the presence of mineralisation, with the grey green and grey quartzites generally carrying the better grades and the lighter grey quartzites being barren. The quartzites vary in thickness from a few inches to several feet and are locally well jointed and fractured.

The fractures and joints are near to or at right angles to the strike of the beds. There appear to be two phases of tension fractures or fissures. The older set often contains smoky quartz and is cut by another set which contains white quartz. Locally there are well developed, steeply dipping fractures at right angles to the plunge of the synclines.

The fractures are filled by quartz with cassiterite, pyrite, chalcopyrite and limonite. The latter is derived from the weathering of sulphides.

The only igneous rock within the lease area is a transgressive quartz dolerite dyke, which strikes at  $50^{\circ}$  magnetic and dips steeply to the north west (see Drawing GPY-053). It is best seen about 40 feet from the entrance of No. 1 South Lower level adit. The dyke was not seen at the surface; this is due to its easier weathering and surface cover of quartzite rubble. It is thought to be a late stage differentiate of a granite mass.

STRUCTURE

The general strike of the beds in the lease area is NW-SE, but this varies due to faulting and folding.

In Brock's Adit and the Brock's Shaft area, the rocks strike east-west and at their approximate southern limit there is a narrow zone of brecciated material (see Drawing GPY-053). The eastern extent of the east-west striking rocks is uncertain.

The mainfold structures of the lease area are two synclines  $S_1$  and  $S_2$ , separated by an anticline  $A_1$  whose curvilinear axial surface trends in a general NW-SE direction.

Anticline  $A_1$  has a smaller, tighter anticline  $A_2$  on its eastern flank which progressively disappears to the north. There is also a small anticline  $A_3$  postulated on the eastern flank of the syncline  $S_1$ .

Syncline  $S_1$  plunges in a general N.W. direction at approximately  $10^\circ - 15^\circ$ . It deepens to the north where it appears to be terminated abruptly.

Syncline  $S_2$  is not so well defined but appears to be terminated at its N.W. end and plunges to the S.E. Its southward extent is uncertain due to insufficient information.

A number of small east-west trending folds were mapped in Brock's Adit.

Shearing may have occurred along the axes of the latter folds either by lateral displacement resulting from north-south compression or by east-west shear movement.

MINERALISATION

There are two areas of major tin mineralisation of which the lateral extents are not fully known (see Drawing GPY-052).

In both areas, the cassiterite mineralisation is mainly in fissures and to a lesser extent along joint planes. Limonite occurs mainly along the joint planes.

Quartz veins are also present and tend to be of two types: (a) the larger ones ( $\frac{1}{2}$ " to 1") having little or no associated mineralisation; (b) the smaller veins ( $\frac{1}{4}$ " and less) visibly carry tin mineralisation.

Many of the quartz veins contain black lined cubic voids suggesting the presence of sulphides in the unweathered rock.

Pyrite was recovered from drill holes 3S 2E and 3S 2.5E at 87 feet and 74 feet respectively.

The fissures containing tin vary in width from  $\frac{1}{50}$ " to  $\frac{1}{2}$ " with an average spacing of  $\frac{1}{2}$ " between these structures. The larger fissures containing mainly quartz and some sulphides (copper, iron) have an average spacing of  $\frac{1}{4}$ ". The length of the smaller fissures varies from an inch to a foot or more and no average could be determined. The majority of fissures containing mineralisation occur in the quartzites and are best developed in areas associated with faulting and/or folding. Tin is also present as a dissemination within the quartzites.

Some tin mineralisation also occurred in the Brock's Shaft area where secondary copper staining was noted. The mineralisation is notably very patchy both laterally and in depth. The dolerite carries no mineralisation and is thought to be a post-mineralisation feature.

The mechanism of mineralisation is unknown but with the presence of the dolerite and granite in the locality there is a strong possibility of a halo type mineralisation associated with an underlying or nearby granitic mass.

### DISCUSSION

Structure and lithology appears to exert a strong control on the mineralisation. Both mineralised zones occur in areas of predominantly quartzite outcrop where the fracturing and jointing is good.

The south-eastern mineralised area lies within the syncline  $S_1$ . The south-western mineralised area appears to be located on the eastern flank of another plunging syncline  $S_2$ . The possible continuation of this latter mineralisation to the south and south-west has yet to be tested.

From the assay data, the quartzites are the rocks which carry the higher grade of mineralisation. The quartzose rocks and shales are progressively less mineralised.

Although the quartzites show good fracturing, they do not all contain good tin values, giving a patchy distribution both laterally and at depth.

Thus another influence on the localisation of the mineralisation must be responsible. The reason for this patchy lateral distribution is probably due to the fissures being best developed in tension zones, possibly associated with the occurrence of faults and/or the degree of folding. This would also be the case with depth.

One practical result of this feature is loss of compressed air through the fissures and joints. This accounts for several drill holes terminating prematurely in mineralised areas.

The northward termination of the synclines  $S_1$  and  $S_2$  with associated mineralisation is possibly due to a fault structure. The faulting hypothesis is supported by the swing of the rocks to strike east-west just north of the synclines, the presence of brecciated material in the same area, and the east-west shears in Brock's Adit. Such a tension zone would explain the tin mineralisation and copper staining found around Brock's Shaft. The correlation between soil sampling and assay data was particularly disappointing in the same area (Drawings GPY-050 and GPY-051). Here, high tin values of over 1% were found in the soils but drill sample assays were poor. The reasons are probably to be found in the lithology of the area.

The lack of outcrop in many areas was also disappointing. This made surface mapping sketchy and incomplete. The area north of the east-west OON map grid reference line provided particularly poor surface information. Thus, underground mapping was mainly used to interpret the structure of this particular area. In general, the underground and surface mapping agreed well to define structural and stratigraphic trends which correlated in most instances with the drill hole lithologies.

Held as transparencies  
in drafting room.

GPY MAP INDEX

GPY-050	Geochemical Sn	
051	Geochemical Cu	
✓ 052	Drilling grid and mineralisation	/
053	Geological Surface Fact	
✓ 054	Geological Surface Interpretation	(Missing - not on Microfiche)
055	Geological Underground Fact	
056	Cross Section Geological Fact	6S
057	"	5S
058	"	4S
059	"	3S
060	"	2S
061	"	1S
062	"	00
063	"	1N
064	"	2N
065	"	3N
066	"	4N
067	"	5N
068	"	6N
069	"	7N
070	"	8N
071	"	9N
072	"	10N
073	"	11N
074	Cross Section Assay Data	6S
075	"	5S
076	"	4S
077	"	3S
078	"	2S
079	"	1S
080	"	00
081	"	1N
082	"	2N
083	"	3N
084	"	4N
085	"	5N
086	"	6N
087	"	7N
088	"	8N
089	"	9N
090	"	10N
091	"	11N
092	Cross Section Ore Reserves	
093	"	
094	"	

Section AA" of boreholes G.P.Y. 1, 2, 3, 4, 5, & 6, /

J.

Following discussions with Mr. D. K. Tester, Chief Geologist, and Mr. G. Krummei, Senior Geologist, the following programme of surface diamond drilling was proposed in the latter's memorandum dated 15 August, 1970:-

<u>Drill Hole No.</u>	<u>Location</u>	<u>Declination</u>	<u>Magnetic Azimuth</u>	<u>Approx. Final Depth</u>	<u>Comment</u>
1	00N/00E	90°	-	400'	Final depth dep. on results.
2	3S/1E	90°	-	350'	
3	3N/4E	90°	-	350'	
4	6S/00E	90°	-	400'	Final depth dep. on results.
5	00N/2E	90°	-	350'	
6	1N/3E	90°	-	350'	
Approx. total				<u>2,200'</u>	

Additional limited drilling may be required to follow up results obtained from the above D.D.H.'s. "

ORE RESERVES

The ore reserves are still being calculated  
and will be an addendum to this report.

ORE RESERVES

The computation of preliminary ore reserve figures is based on the results of 137 percussion drill holes and 2,951 assays.

Two areas were defined at the prospect where near-surface cassiterite mineralisation was encountered relatively consistently.

A third area in the vicinity of Brock's Shaft contains only small, scattered pockets of tin and secondary copper mineralisation unsuitable for extraction by open cut mining methods. It does not feature in this ore reserve assessment.

Reserves of indicated ore were calculated in cross section only, assuming:

- (1) Persistence of mineralisation for a reasonable distance laterally beyond each mineralised intercept.
- (2) Relatively uniform overall distribution of mineralisation within the block influenced by each drill hole.
- (3) Regular spacings between holes drilled.

Tonnages of inferred or prospective ore were estimated by planimeter on the basis of:

- (1) The premise of an overall lithological influence on the occurrence of cassiterite-bearing fissures.
- (2) Structural interpretation of the sub-surface geology.
- (3) The possibility of a relatively uniform distribution of mineralisation within the lithological units considered.

Since the geological structure of the area and controls on mineralisation are still poorly defined, it follows that the tonnages and grade of inferred ore are at best only approximations.

Sampling has shown that grade variations within the mineralised zones are generally erratic and range from <0.01% Sn to a maximum of 3.82% Sn. Re-drills reflected only broadly the values encountered in earlier holes. Hence all grades must be viewed with caution at this stage.

The ore reserve situation at the prospect within the leases held under option by <sup>PARINGA MINING + Expl. Co. Ltd.</sup> ~~Abercrombie & Co. N.L.~~ is summarised in Tables I - III below:-

TABLE I

S.E. AREA			
Section	Indicated Ore (Tons)	Weighted Grade % Sn	Inferred Ore (Tons) by planimeter
6S	2,554	0.24	50,580
5S	29,197	0.45 <sup>+</sup>	46,360
4S	159,346	0.28	269,386
3S	143,794	0.25	82,792
2S	41,350	0.31	161,192
1S	25,876	0.24	92,144
TOTALS	402,117	0.28 <sup>*</sup>	702,454

+ Heavily influenced by 1 large block.

\* Grade by arithmetic averaging 0.30% Sn.

TABLE II

S.W. AREA			
Section	Indicated Ore (Tons)	Weighted Grade % Sn	Inferred Ore (Tons) by planimeter
3S	34,668	0.37	154,422
2S	67,508	0.30	158,792
1S	29,192	0.20	122,260
00	279,150	0.34	377,322
1N	229,920	0.35	173,166
2N	149,058	0.30	278,394
3N	113,856	0.39	429,688
4N	93,048	0.30	272,400
TOTALS	996,400	0.33 <sup>*</sup>	1,966,444

\* Grade by arithmetic average: 0.32% Sn

TABLE III

COMBINED AREAS			
Area	Indicated Ore (Tons)	Weighted Grade % Sn	Inferred Ore (Tons)
S.E.	402,117	0.28	702,454
S.W.	996,400	0.33	1,966,444
TOTALS	1,398,517	0.31 <sup>*</sup>	2,668,898

\* Grade by arithmetic average: 0.31% Sn, influenced mainly by lower overall grade values in the S.E. Area.

The total ore potential as indicated to date by percussion drilling is of the order of 4,067,415 tons, say  $4 \times 10^6$  tons @ 0.31% Sn in "round figures". However, examination of the results of the calculations suggests that the mineralisation in that portion of the S.E. area which was tested under the present programme is uneconomic.

In the S.W. area, a small portion of the indicated ore may not be amenable to extraction by open cut methods of mining.

There are indications that the southern extension of the mineralisation in the S.E. area does not continue far beyond line 6S, but mineralisation persists over 400 feet in a north-westerly direction and has been followed downplunge up to the boundaries of lease 23M/62.

Mineralisation in the S.W. area first appears as a small coherent zone at about section 4N and was traced downplunge to the S.E. for 700 feet in plan. The full downplunge and downdip extent of this zone has yet to be tested.

Thus, additional tonnages of ore could accrue from the investigation of the "open ends" of the mineralised zones in the S.E. and S.W. areas and at depth.

Apart from the usual, adverse factors (e.g., dilution, sampling errors, etc.) which must be taken into consideration in ore reserve estimates of this type, the following must be singled out for special attention:-

- (1) The erratic distribution of mineralisation at the prospect.
- (2) The degree of lithological control exerted upon the localisation of the mineralisation.
- (3) The validity and accuracy of the structural interpretation of the geology of the area.

G. KRUMMEI.

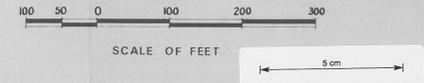
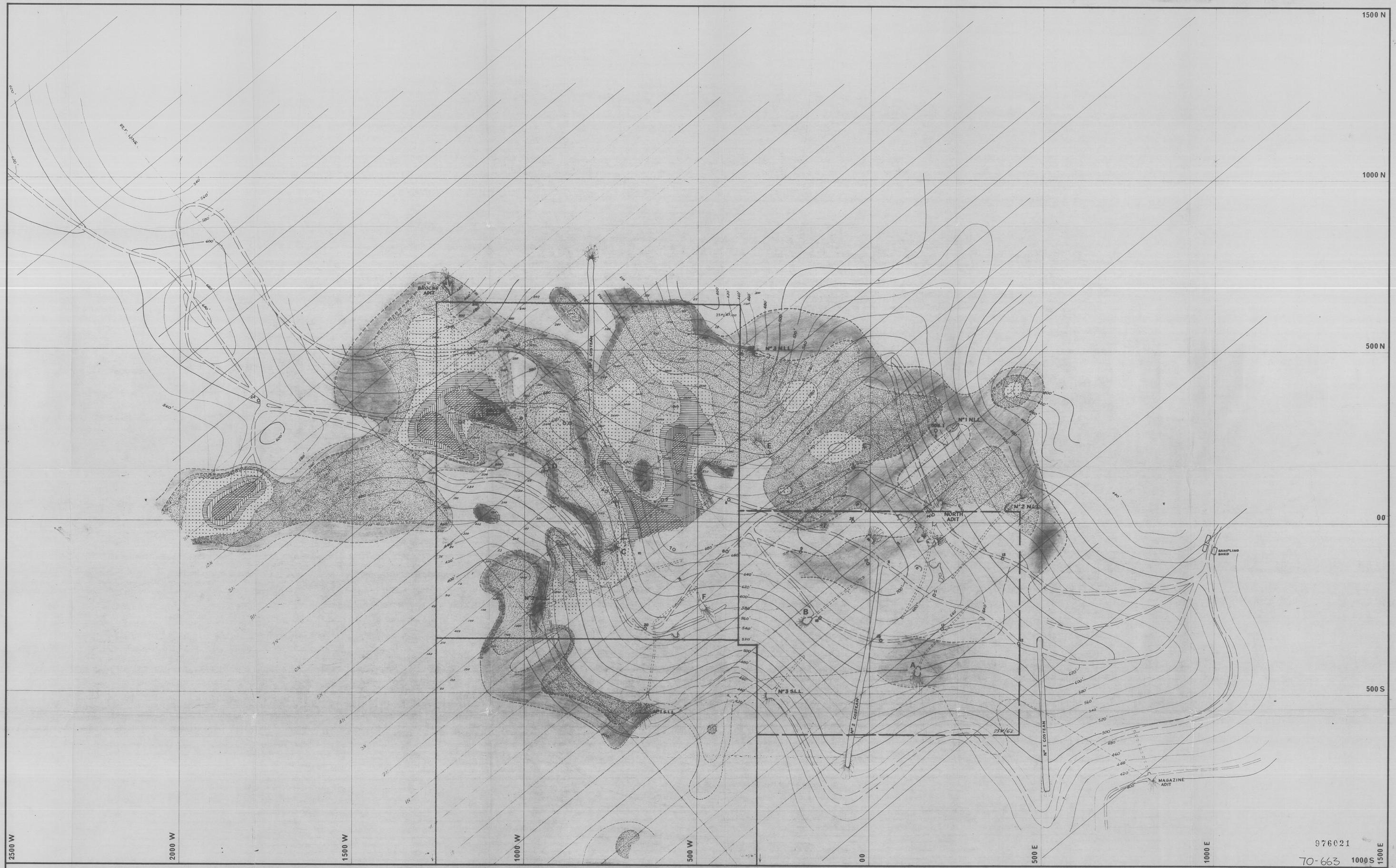
Q41 No. 46

Progress Report No.1 on Exploration at  
Great Pyramid N.E. Tasmania  
(Aberfoyle Management - Paringa).  
and Plans R.J. Varley 1970.

Map index lists 45 plans.

4 only of these are available plus one unlisted item.

G.P.Y.	050	Geochemical Distribution Sn	} originals, film copies
G.P.Y.	051	Geochemical Distribution Cu	
G.P.Y.	052	Drilling grid and mineralisation)	
G.P.Y.	054	Geological Surface interpretation)	} <sup>Missing</sup> original, dyeline copy
G.P.Y.	?	Section AA" of B.H. G.P.Y. 1-6	
G.P.Y.	053	Geological Surface Fact	} copies not available; plans never held by Department of Mines
G.P.Y.	055	Geological Underground Fact	
G.P.Y.	056	} Cross section Geological Fact	
G.P.Y.	073		
G.P.Y.	074	} Cross section Assay Data	
G.P.Y.	091		
G.P.Y.	092	} Cross section Ore Reserves	
G.P.Y.	094		



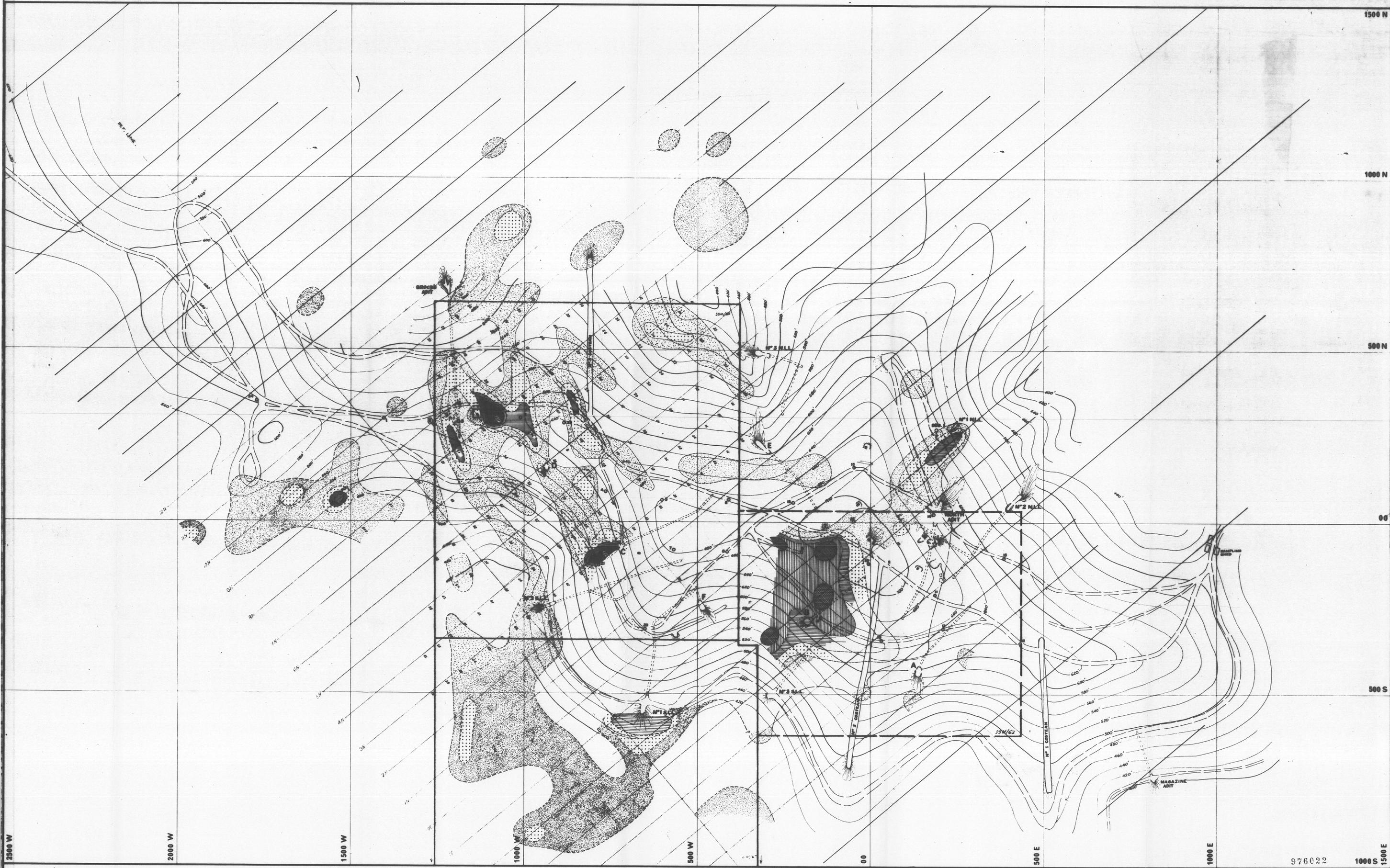
P.M.E.C.L.  
 GREAT PYRAMID  
 SOIL GEOCHEMISTRY  
 ppm. Sn.

0 - 499
500 - 999
1000 - 1999
2000 - 2999
3000 - 3999
4000 - 4999
5000 +

976021  
 70-663 1000 S 1500 E  
 SURVEY -  
 GEOLOGY -  
 DRAWN -  
 TRACED -  
 DRAWING No. -GPY-050

TRACED FROM B.H.P. PLAN N° G1378.

4311



PARINGA MINING & EXPLORATION CO. LTD.  
**PM.E.C.L.**  
 (ABERFOYLE EXPLORATION)  
**GREAT PYRAMID**  
 SOIL GEOCHEMISTRY  
 ppm. Cu.



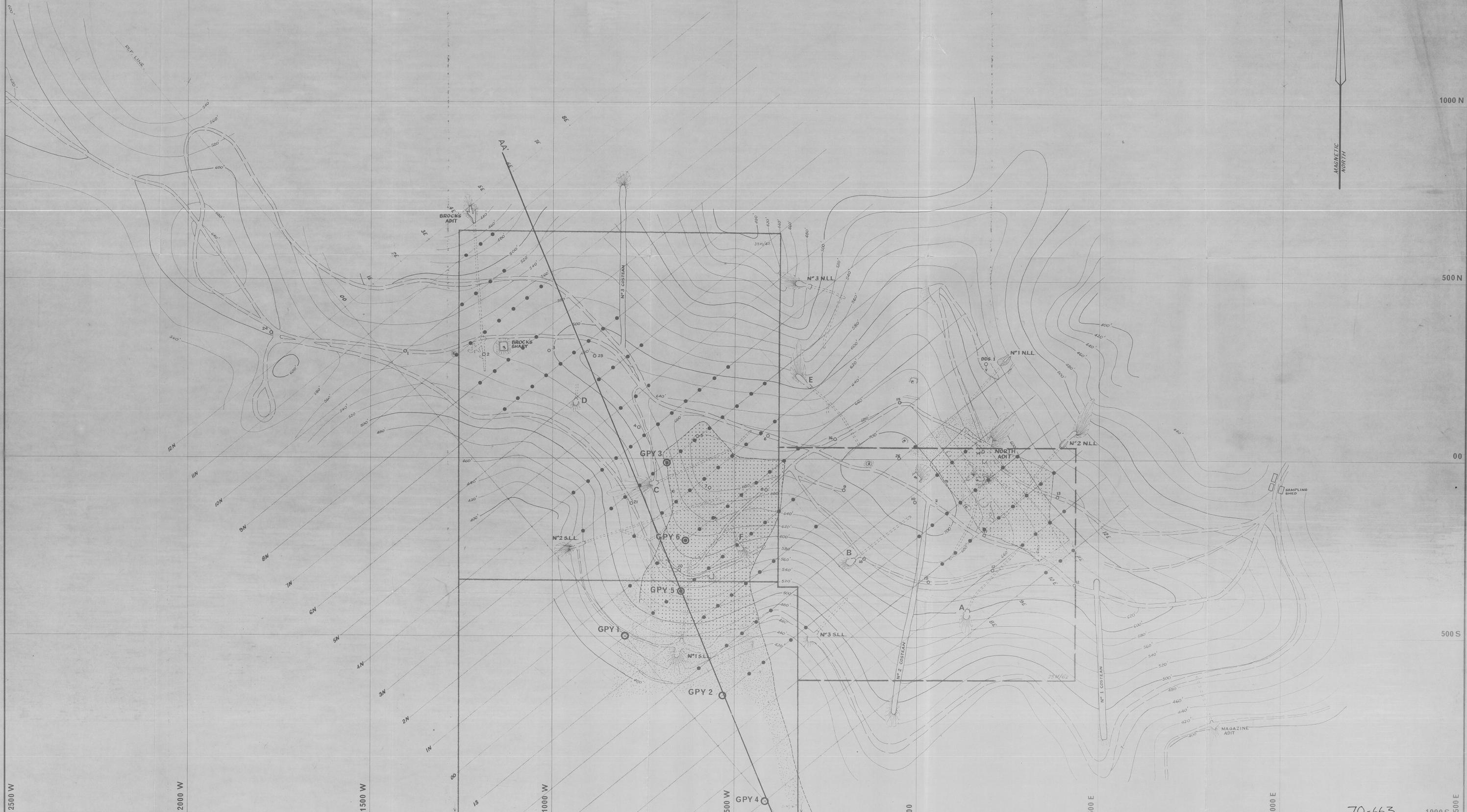
976022 1000 S 1500 E

SURVEY - - - - -  
 GEOLOGY - - - - -  
 DRAWN - - - - -  
 TRACED - - - - -

**DRAWING No. - GPY-051**

TRACED FROM B.H.P. PLAN N° G 1378.

TRANSPARENCY IN DRAFTING ROOM.



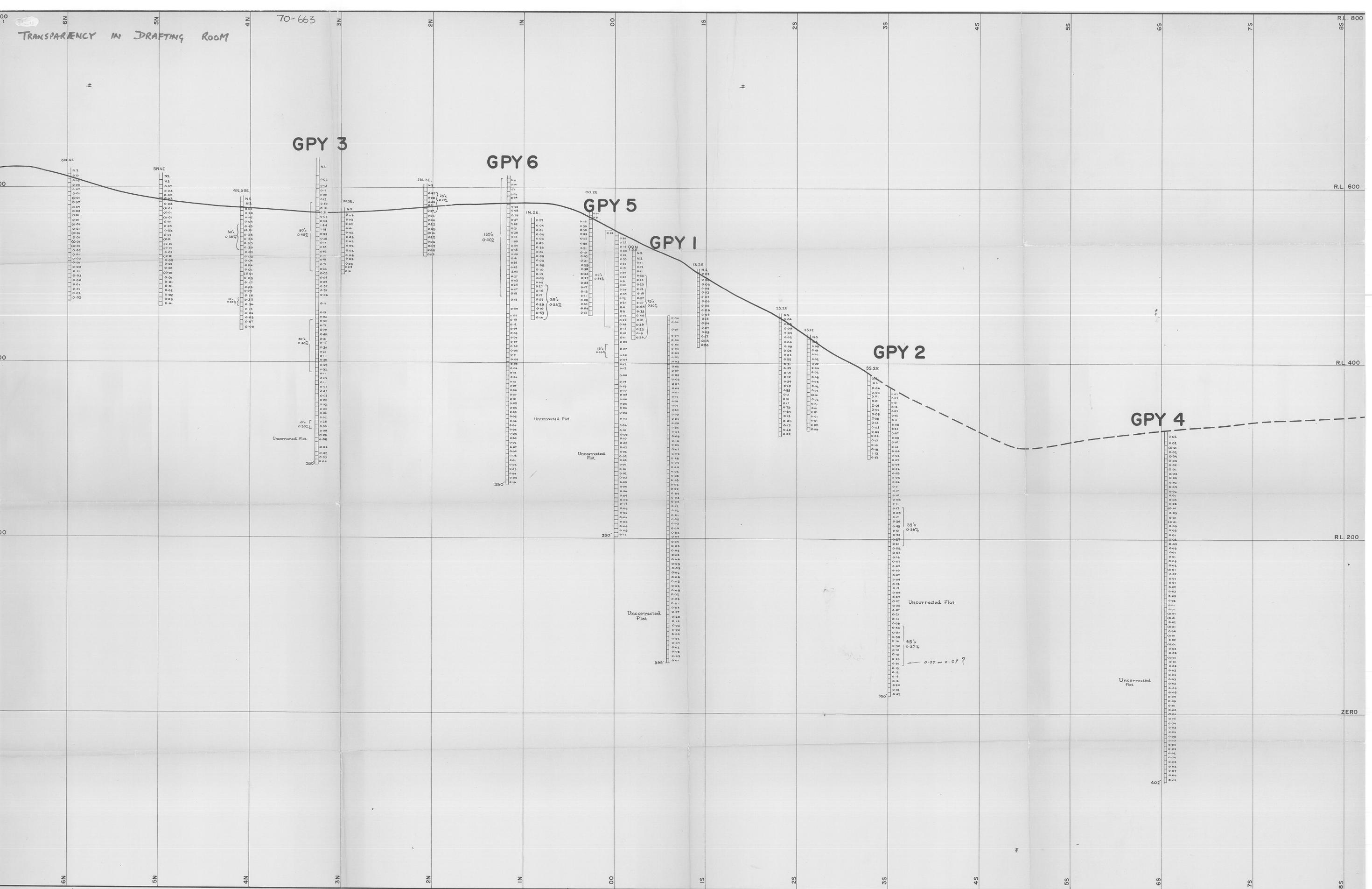
70-663

P.M.E.C.L.  
GREAT PYRAMID  
SHOWING PERCUSSION DRILLING AND MINERALIZATION

- MINERALIZATION
- POTENTIAL MINERALIZATION
- COMPLETED PERCUSSION DRILL HOLE

TRACED FROM B.H.P. PLAN N° 61378

SURVEY - - - - -  
 GEOLOGY - - - - -  
 DRAWN - - - - -  
 TRACED - - - - -  
 DRAWING No. - GPY-052



- < 0.15% Sn
- 0.16% - 0.24% Sn
- 0.25% - 0.49% Sn
- 0.50% - 0.99% Sn
- 1.00% +

**GREAT PYRAMID  
CROSS SECTION AA'  
SHOWING GPY 1.2.3.4.5.6.**

SURVEY - - - / /  
 GEOLOGY - - - / /  
 DRAWN - - - / /  
 TRACED - - - / /  
 DRAWING No. - - - / /

976024