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159001

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GEOLOGICAL REVIEW - DOLPHIN OREBODY

SEPTEMBER, 1974.

by

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LIST OF PLANS

DOLPHIN MINE

159003

Geological Level Plan -75 m R.L. ✓

" " " -125 m R.L. ✓

Proposed drill drive and DDH cuddy locations -150 m R.L. ✓

" " " " " " " -200 m R.L. ✓

Geological Cross Section showing proposed drill holes, 220 080 E ✓

" " " 220 120 E ✓

" " " 220 160 E ✓

" " " 220 200 E ✓

" " " 220 240 E ✓

" " " 220 280 E ✓

" " " 220 320 E ✓

" " " 220 360 E ✓

" " " 220 400 E ✓

Ore Resource Table (3.9.74) ✓

INTRODUCTION

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In June 1973 access to the Dolphin Mine was gained via a decline from 19 bench in the Open Pit and in December of that year an oreblocking program was commenced. Mine development has now proceeded to the point where the mine is in limited production and the oreblocking program is well advanced.

This report reviews the progress in so far as it affects the geology and makes recommendations for the continuation of the oreblocking program.

SUMMARY

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The underground oreblocking program commenced in December, 1973 is continuing and to date 34 holes have been completed for 3,023 metres.

The original C lens oreblocking program of 3,500 metres (40 holes) has been expanded to 4,461 metres (49 holes). This is an additional 961 metres. A further 685 metres (14 holes) has been proposed to broadly define B lens and an additional 210 metres (6 holes) is proposed to examine C lens above the -75m R.L. in the Wedge area.

The above drilling program for 1974-5, amounting to 1,856 metres at a cost of \$70,000 was presented for approval at the August Technical Meeting.

The present underground drilling has proved 542,000 tonnes at 1.20% WO_3 of C lens. The expanded program for 1974-5, outlined above, should prove approximately 3,000,000 tonnes down to the -175m R.L.

The ore resource has been recalculated using the new I.S.G. sections (previously calculated from the inclined 'N sections') and the total Proven and Probable ore resource of Dolphin is 6,722,100 tonnes at 1.02% WO_3 . A further 1,000,000 tonnes is classified as Possible.

The underground oreblocking has proved the ore lying between 220 000 E and 220 160 E, and the No. 3 Fault to the -150m R.L. It is considered that on the 40m cuddy spacing presently in use, the geological correlation of the ore horizon is not adequate for accurate projection between sections. There is a 'haziness' to the outlines between sections of up to possibly 5 - 10 metres, particularly in the footwall where the contact is a grade % WO_3 boundary. Fill-in drilling on 20m cuddy spacings is recommended.

It is also suspected that east of 220 160 E where the ore is very much thicker, there may be insufficient grade data for accurate resource estimation. An immediate study of this problem by the Computer Section is recommended to determine whether 20m cuddy spacings are required east of 220 160 E.

On completion of the exploratory drilling of B lens (40m cuddy spacings) the lens will require oreblocking on 20m spacings in the areas with mining potential.

Future oreblocking programs for C lens will require drill-drives on the -150m, -200m and -250m R.Ls. If these programs use cuddies at 40m spacings approximately 3,550 metres (40 holes) will be required.

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CONCLUSIONS

1. The 40m spacing presently in use to oreblock C lens is considered inadequate between 220 000 E and 220 160 E for definition of ore outlines.
2. It is suspected that 20m drill spacings will be required east of 220 160 E to provide sufficient grade data for resource estimation.
3. The irregular nature of the B lens mineralization will necessitate a detailed close spaced drilling program (20m) to provide adequate definition for mining purposes.
4. The basic structure of the Dolphin mine series is that of an anticlinal nose plunging southeast at 30° cut by two major faults - the Central and Wedge Faults.
5. Skarns in immediate proximity to major faults (say 5 - 10 metres) may be severely leached with little structural strength.
6. The nature of the Wedge Fault is unclear. North of the No. 3 Fault it appears as a major reverse fault and south of this point as a normal fault with small offset.
7. The Northern Boundary Fault has a significant breccia zone approximately 4 metres wide as has been indicated by two drill holes on 220 160 E. Diamond drillers reported no significant change in water pressure in the breccia zone.
8. To date the quartzites have been the 'wettest' rocks intersected in the mine openings although a wet zone was intersected in the sheared and brecciated biotite hornfels in the main decline. A test DDH (D 080/6) into the quartzites encountered water inflows estimated at 50 gallons / minute.

RECOMMENDATIONS

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1. The C lens oreblocking program be reduced to 20m spacings between 220 000 E and 220 160 E.
2. A study be carried out immediately by the computer section to determine whether sufficient grade information is available from drilling on 40m sections to ensure grade predictability for mining purposes. A decision should be made as soon as possible as to whether 20m cuddy spacings are required east of 220 160 E.
3. On completion of the present B lens exploratory oreblocking program the areas with mining potential be oreblocked on 20m spacing.
4. A study be undertaken by the Computer Section to determine the significance of the high grade (+ 4% WO₃) assays.
5. Detailed mine planning be deferred until the area has been adequately oreblocked.

ACTION SHEET

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GEOLOGY - REVIEW

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MINE OPENINGS

Main Decline

The main decline was commenced in June 1973 and has now been developed a total of 440 metres (3.9.74).

The decline was collared in lower C lens and then progressed up the stratigraphic column and approximately 65% of the driveage has been in B lens hangingwall biotite hornfels. The initial 75 metres of development yielded 5,473 tonnes of ore at an estimated (lamping) grade of 0.6% WO_3 .

Considerable use was made of cover diamond drilling ahead of the face to assist in prediction of rock types and associated ground conditions and four holes totalling 409.2m were drilled for this purpose. The only two significant areas of bad ground were forecast in this manner, ie. the upper volcanic contact near 220 090 E and the sheared biotite hornfels with associated strong water inflows at 220 260 E.

The major Wedge Fault was intersected at 220 230 E with no poor ground associated. A number of minor faults have been located.

No surface diamond drill holes have been intersected.

The decline is expected to enter the banded silicate hornfels of the upper B lens during period 4.

B lens

Development in the B lens sequence has been on the -75m level. The sequence has consisted of a variety of banded biotite pyroxene hornfels, barren marbles and variably mineralized grossular and andradite garnet skarns. A total of 3,692 tonnes of ore has been mined at an estimated grade (grab samples) of 0.45% WO_3 . Ground conditions have been uniformly good.

From a geology point of view this development has been useful in locating the Wedge Fault and demonstrating a swing in strike of the mine series from 050° I.S.G. at 220 140 E to 000° I.S.G. in the P16 drive.

Surface DDH 211, which was making a minor amount of water, was intersected in this drive.

-75m Cross Cut and 75 L 16 Ventilation Cross Cut

Development in both these headings has again been in good ground conditions.

The 75m X-Cut was driven mainly in biotite hornfels where it intersected the Central Fault and then through 5m of high grade skarn before passing through the No. 3 Fault. There was no significant bad ground or water inflow associated with either fault.

The 75 L 16 Ventilation X-Cut is a continuation of the 75m X- Cut into the quartzites. A test DDH (D 080/6) was drilled ahead of the development and the poor quality of core and high water inflow (up to 50 gallons/minute) appeared to confirm the view gained from surface diamond drilling that the quartzites were poor ground. However 75m of development has now taken place, within the quartzites, being entirely self supporting - a fact which may be explained by the absence of chlorite on the fracture surfaces of the strongly jointed rock.

Surface DDH's 173 and 232 were intersected in this drive, both making water estimated at 40 gallons/minute.

C lens Central

Some ore had previously been indicated in this area by surface DDH 194 but was confirmed by D 120/1 (5m @ 10.6% WO_3) drilled ahead of the face in the 75m X - Cut.

Development eastwards through this area yielded 9,748 tonnes at an average grade (grab samples) of 1.8% WO_3 .

Rock types were skarn and pyroxene garnet hornfels and ground conditions were excellent.

C lens - Pit Section

The geology in this area has been generally as depicted by surface drilling on Open Cut geological sections 00 - 1S - 2S - 3S.

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A total of 13,897 tonnes of ore at an average grade (grab samples) of 0.55% WO_3 has been mined.

Surface DDM's 182 and 193 have been intersected in this area, both making minor amounts of water.

DIAMOND DRILLING

The original purpose of the oreblocking program was to oreblock C lens to -150m R.L. from openings at 40m intervals from the planned exploration decline. For this purpose a program of 40 holes totalling 3,500 metres was approved. However since that time mine development has expanded from the decline concept and additional sites have become available. An expanded program of holes totalling 4,461 metres was approved (August, 1974) which is designed to prove C lens ore to the -175m R.L. i.e. approximately 3,000,000 tonnes. A further 685 metres for B lens and 210 metres for C lens above -75m R.L. in the Wedge area is also approved.

Diamond drilling commenced in December, 1973 and to date 34 holes have been completed for a total metreage of 3,023 metres. The major part of the drilling has been carried out by two F 30 rigs with an E 500 machine employed for two up-holes. Drilling has been conducted on 40m spacings using six drill sites in the main decline and three in the B lens drive.

All holes have been drilled BQ with the exception of the two up-holes which were A 17 and one down hole experiment in AQ. The AQ was discontinued due to a slower penetration rate and also there was the disadvantage of the smaller volume of core for assay.

As part of normal procedure all holes are cemented on completion and surveyed using a Kodak Eastman Multishot Camera. Survey results indicate that the holes are maintaining a good line with virtually no deflection and only minor deviation usually to the west.

A detailed summary of the completed diamond drilling is presented in Appendix 1.

DISCUSSION OF RESULTS

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Structure

One of the main purposes of the underground diamond drill program was to clarify the structure of the deposit and solve the dispute as to whether the orebody represented part of a anticlinal nose plunging southeast (Kinnane, January 1971) (Danielson, May 1971) or a block faulted stratiform deposit (Bujtor, August 1973). At this stage of the program the evidence is incomplete but would appear to favour the anticline cut by two major faults - the Central and Wedge Faults.

The principal evidence for this view is the significant change in strike of the mine series from 070° ISG in the C lens Central area to 000° ISG in the P16 drive. The northerly strike in what is described as the Wedge area or Eastern limb of the structure had earlier been indicated by drilling on 220 160 E and 220 240 E. Completion of drilling on the 220 200 E section (estimated late November) should confirm this picture. Evidence from the B lens drive also indicates that the change in strike begins to occur westward of the Wedge Fault and does not appear to be entirely the result of some rotation on the Wedge Fault.

Within the mine series numerous faults have been intersected in the drill holes and the mine workings although on present indications only three are significant.

The Central Fault had earlier been inferred from surface drilling and was described by Bujtor (August, 1973) as a reverse fault striking 110° ISG, dipping north at $50 - 75^{\circ}$ and having an approximate throw of 15 - 45m. More detailed drilling between 220 040 E and 220 160 E has now shown the Central Fault to be normal with a strike of 115° ISG swinging to 080° ISG east of 220 120 E. A southerly dip of $68 - 75^{\circ}$ is defined. The relative movement of this fault is 40m south block down at 220 040 E decreasing to 20m south block down at 220 120 E.

A second major fault not detected from surface drilling is the fault (unnamed) sub parallel to the No. 3 Fault (section 220 030 E) which causes the mine series and ore horizons to bend upward above the -75m RL. The relative movement on this fault must be in excess of 70 metres north block up. This fault is well exposed in the C lens Central area on the -75m RL.

The Wedge fault is the third fault which could be described as major. This fault is interpreted as truncating the No. 3 Fault and then together with the Northern Boundary Fault forming a wedge of mine series rocks in the north of the orebody.

In this area the Wedge Fault would necessarily be a reverse fault with significant throw (Bujtor, August 1973), however within the mine series, in the area oreblocked, it appears as a normal fault with relative movement of 10m east block up. This interpretation is gained from drill hole intersections on 220 160 E and 220 200 E and fault intersections in both the B lens drive and main decline in the expected position. On section 220 240 E the severely leached and brecciated core in DDH D240/5 may indicate the proximity of a major fault zone and this position would concur with the anticipated position of the Wedge Fault.

These features could be explained by having the Wedge Fault rotate on a pivot, some where near the No. 3 Fault which would then infer that the Wedge Fault will be a normal fault of significant proportion further south.

Numerous minor faults within the mine series have been mapped in mine openings and logged in drill core but would seem to have little significance on present evidence.

Limiting faults remain as defined by surface drilling. The No. 3 Fault was defined approximately 10 - 15m further south than anticipated between 220 000 E - 220 080 E but then swung northeast to the expected position near 220 120 E. This fault has now been defined over a strike length of 160m and shown to have a southerly dip varying between 60 - 80°.

The Northern Boundary Fault has been intersected in two holes on 220 160 E in its expected position and shown to have an apparent dip south of 67°. The strike is not defined but inferred from surface drilling as 120° ISG. Both holes which passed through this fault indicated a breccia zone 4m wide but no associated quantities of water. Both holes were making approximately 0.5 gallons/minute on completion.

There has been no oreblocking within 150m of the anticipated position of the Grassy River Fault.

Diamond drilling south of the decline on 220 020 E has indicated the possibility of a fault located between D030/7 and surface DDH 406 possibly sub parallel to the Central Fault with a similar relative movement of south block down. No fault is inferred at present but the area will bear close scrutiny.

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In general the correlation of stratigraphy, structural features and ore outlines between drill sections is good with the following exceptions:

1. there is a 20m change in the relative level of the C lens ore south of the Central Fault between 220 000 E and 220 040 E.
2. the occurrence of quartzites at the -80m RL between the No. 3 and Central Faults on 220 040 E.
3. the rapid increase in thickness of ore horizons
 - a. in the Central C lens area east of 220 040 E and
 - b. east of 220 120 E south of the Central Fault.

The unexplained nature of points 1 and 2 above leaves too much room for interpretation, the accuracy of which would be important to Mine Planning in the design of the main decline at approximately the -160m RL. To adequately define the structure in this area drilling would be required on 220 020 E and 220 060 E.

Point 3 above introduces a degree of uncertainty of perhaps 5 - 10m in ore outlines in plan view between sections, particularly in the footwall of the lower C lens horizon. To provide more accurate ore definition drilling will be required on 20m spacing between 220 040 E and 220 160 E. East of 220 160 E no drill sections are complete and it is not yet known whether the 40m spacing will be adequate or a closer spacing required.

An earlier report (Danielson, Dec. 1971) on the underground oreblocking of the Dolphin Orebody had recommended an initial cuddy spacing of 20m. Subsequently it was recommended by Bujtor (1973) that drilling from cuddies spaced 20m apart be undertaken in areas requiring same, as determined from the initial 40m spaced drilling.

Stratigraphy

Underground diamond drilling has so far confirmed the stratigraphy detailed by previous workers eg. (Bujtor, August 1973) although no hole has continued deep enough to locate either the basal quartzites or granite basement.

The only significant exception to the accepted stratigraphy was a second pyroxene garnet hornfels (pgh) and skarn intersection at depth in D240/5. The units did not appear to be faulted in position but as they occur only 80m north of a faulted 'second' pgh and skarn in DDM 408 this maybe the case. The relationship here is not clear at present.

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Mineralization

The oreblocking program to date has been concerned principally with the definition of C lens although some minor B lens intersections have been made.

Some points arising from the drilling so far are:

1. There is a wide variety in thickness and grade of C lens intersections eg.
 D040/3 7m @ 0.91% WO₃
 D200/1 20m @ 4.06% WO₃
2. There is a wide variation in individual assays in any intersection eg.
 D120/1 a high assay of 21.3% WO₃
3. The massive andradite garnet skarn of the upper C lens is of a higher grade than the banded garnet hornfels of the lower C lens. eg.
 D240/2 upper C lens 20m @ 1.80% WO₃
 lower C lens 24m @ 0.80% WO₃
4. The significance of the high (say +1% WO₃) assays. D 120/1 achieved an intersection of 3m @ 10.6% WO₃ ahead of the face in the 75m X-Cut but when mining progressed through this ore the average of the three sludge samples and three sets of grab samples applicable to the area were 2.0% and 2.36% WO₃ respectively.

This is obviously an extreme example but the implications are enormous. Because the oreblocking program is at present being drilled on 40m section spacing it is planned for the total proved and probable resource of C lens (5,930,000 tonnes at 1.02% WO₃) to be defined by approximately 100 holes which it is strongly suspected will not supply sufficient grade information. Use of the computer in the ore resource/reserve calculation will have the advantage of being able to integrate neighbouring ore intersections but it is suspected that the drill hole spacing i.e. caddy distances are too wide for adequate grade control.

The Open Cut was drilled out on sections approximately 40m apart and while this was adequate to define the position of the ore it was insufficient to predict oreblock grades with certainty.

FUTURE OREBLOCKING PROGRAMS

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Underground diamond drilling planned for the remainder of 1974 - 5 is as follows:

Continue oreblocking C lens (40m cuddy spacing)
1,438 metres (15 holes).

Broadly explore B lens (40m cuddy spacing)
685 metres (14 holes).

Oreblock C lens above the -75m RL in the Wedge Area
(20m cuddy spacing)
210 metres (6 Holes).

Total 2,333 metres (35 holes).

These programs were presented at the August Technical meeting.

On completion of drilling planned for the current year, two oreblocking programs remain to be implemented.

1. To complete the oreblocking of C lens south and east to the Grassy River Fault. It is anticipated that this will require drill sites on the -150m RL and -200m RL (see attached plans) and also in the -250m RL in the extreme east near 220 400 E.

If the program is continued at 40m spacing a further 3,550 metres (40 holes) will be required.

However in the event of the decision being taken to oreblock C lens on 20m spacings, the drilling required to fill in between the sections already drilled and continue the program to completion is estimated at 12,000 metres (130 holes). Of this amount approximately 3,500m would be required on the 'fill in' sections between 220 000 E and 220 240 E.

2. To define B lens for mining purposes. The nature of the mineralization will determine that the program be conducted on close spaced drill sections (20m) with holes drilled from cuddy positions specifically designed for oreblocking purposes. It is not intended to design this program until the exploratory B lens program planned for this year on 40m spacing (685m, 14 holes) is completed.

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ORE RESOURCE CALCULATION

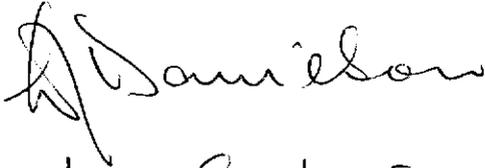
The previous ore resource calculation (Bujtor, August, 1973) was defined between the surface drilling sections 1N, 2N etc. and was extended west to section 6 in the Open Pit to include all ore that was not planned to be mined by open cut methods. A grade cut off 0.25% WO_3 was applied and all +4% assays were written down to 4%. Volume was calculated using the truncated cone formula and an S.G. of 3.3 was used.

The present oreblocking program being conducted on I.S.G. has proved ore defined within this rectilinear grid. The parameters for grade cut off, volume and tonnage calculation were the same as for the previous calculation.

It was considered appropriate to redefine the probable ore resource on the same grid system and to enable this to be done a series of cross sections were constructed from surface drill hole information between 219 880 E (approximately equivalent to section 6) and 220 400 E. Tonnages were calculated in the normal way but it was necessary to weight grades over varying intervals dependent upon the distribution of the surface drill holes.

There was no attempt made to redraw the B lens ore outlines on the I.S.G. sections. Consequently the B lens resource has not been recalculated. The resource has not been corrected for the 3,692 tonnes of development ore mined.

Geopelo Limited


Mine Geologist.

REFERENCES

189019

- Bujtor, G. J., August, 1973. Diamond drill hole reappraisal of Dolphin Orebody.
- Danielson, M. J., May, 1971. Progress report No. 2 Orebody. King Island.
- Danielson, M. J., December, 1971. Underground oreblocking No. 2 Orebody, King Island.
- Kinnane, N. R., January 1971. Progress report on No. 2 Orebody. Eastern Mineralization.

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APPENDIX 1SUMMARY OF DIAMOND DRILLING RESULTS

DRILLING SECTION	HOLE No.	BEARING I. S. G. (°)	INCLINATION (°)	TOTAL DEPTH (m)	MINERALIZATION (WO ₃)	REMARKS
220000E	D000 /1	360	-43	18.95	C lens: 0-6m, 6m @ 1.08%	No. 3 Fault @ 6.72m
	D000 /2	180	-65	61.72	C lens: 1-8m, 8m @ 3.10% 32-35m, 3m @ 0.44% 37-39m, 2m @ 0.78%	
	D000 /3	180	-45	103.93	C lens: 4-18m, 14m @ 3.94% 54-69m, 15m @ 1.32% 72 - 82m, 10m @ 0.51%	
220040E	D040 /1	360	-65	33.37	C lens: 12-16m, 4m @ 2.37%	
	D040 /2	180	-77	83.24	C lens: 65-68m, 3m @ 1.19%	
	D040 /3	180	-54.5	106.07	C lens: 84-91m, 7m @ 0.91%	
	D040 /4	360	-17.5	43.08	C lens: 15-19m, 4m @ 4.22%	No. 3 Fault @ 31.10m
220080E	D080 /1	360	-43	77.42	C lens: 29-31m, 2m @ 1.45% 34-42m, 8m @ 1.48% 44-53, 9m @ 0.76%	No. 3 Fault @ 71.34m Central Fault @ 21.0m

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DRILLING SECTION	HOLE No.	BEARING I.S.G. (o)	INCLINATION (o)	TOTAL DEPTH (m)	MINERALIZATION (WO ₃)	REMARKS
	D080 /2	350	-80	78.63	C lens: 48-50m, 2m @ 0.32%	Central Fault @ 46.0m
	D080 /3	360	-12.5	72.24	C lens: 45-54m, 9m @ 0.96%	Central Fault @ 19.0m No. 3 Fault @ 67.95m
	D080 /4	180	-75	95.40	C lens: 64-67m, 3m @ 0.34% 74-78m, 4m @ 1.83% 81-85m, 4m @ 1.27%	
	D080 /5	360	+14	97.66	C lens: 63-68m, 5m @ 1.78%	No. 3 Fault @ 92.0m Central Fault @ 22.0m
	D080 /6	333	+17.5	82.90	Nil	
	D080 /7	180	-60	123.80	Not Available	
220120E	D120 /1	360	0	60.65	C lens: 38-43m, 5m @ 10.6%	No. 3 Fault @ 50.7m
	D120 /2	360	-84	104.24	B lens: 15-17m, 2m @ 1.28% C lens: 73-84m, 11m @ 0.94%	Central Fault @ 88.5m(?)
	D120 /3	360	-34	54.25	C lens: 47-54m, 7m @ 1.02%	Central Fault @ 39.5m
	D120 /4	360	-65	70.41	C lens: 13-15m, 2m @ 2.29%	No. 3 Fault @ 50.5m

DRILLING SECTION	HOLE No.	BEARING I.S.G. (o)	INCLINATION (o)	TOTAL DEPTH (m)	MINERALIZATION (WO ₃)	REMARKS
					22-29m, 7m @ 1.38%	
					31-38m, 7m @ 2.52%	
					42-44m, 2m @ 0.87%	
					51-55m, 4m @ 1.57%	
	D120 /5	180	-63	99.97	C lens: 18-22, 4m @ 0.46%	
					32-40m, 8m @ 2.28%	
					46-77m, 31m @ 0.85%	
	D120 /7	360	-67	75.39	C lens: 61-75m, 14m @ 0.83%	Central Fault @ 62.0m
	D120 /8	180	-72	110.64	C lens: 75-93m, 18m @ 1.11%	
220160E	D160 /1	360	-30	105.16	C lens: 79-89m, 10m @ 0.40%	No. 3 Fault @ 53.0m Wedge Fault @ 57.0m
	D160 /2	360	-60	81.84	C lens: 29-46m, 17m @ 1.06%	No. 3 Fault @ 70m
					49-57m, 8m @ 0.51%	
					59-61m, 2m @ 0.39%	
	D160 /3	360	-86	75.44	C lens: 35-41m, 6m @ 0.87%	
					45-48m, 3m @ 0.35%	
					50-57m, 7m @ 1.59%	

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DRILLING SECTION	HOLE No.	BEARING I.S.G. (o)	INCLINATION (o)	TOTAL DEPTH (m)	MINERALIZATION (WO ₃)	REMARKS
	D160 /4	180	-60.75	136.55	C lens: 46-57m, 11m @ 1.90% 70-104m, 34m @ 1.64% 108-114m, 6m @ 0.59%	Central Fault @ 57.0m
	D160 /6	360	-2	132.28	C lens: 63-118m, 55m @ 1.68%	No. 3 Fault @ 44.5m Wedge Fault @ 58.5m Northern Fault @ 126.0m
	D160 /7	360	-19	124.82	C lens: 48-96m, 48m @ 1.23%	No. 3 Fault @ 41.5m Wedge Fault @ 45.7m Northern Fault @ 118.0m
220200E	D200 /1	180	-70	105.46	B lens: 5-8m, 3m @ 3.15% 16-19m, 3m @ 0.63% 30-33m, 3m @ 0.47% C lens: 58-65m, 7m @ 0.68% 73-93m, 20m @ 4.06%	
	D200 /2	360	-85	90.53	B lens: 2-6m, 4m @ 0.99% C lens: 51-60m, 9m @ 0.72% 65-72m, 7m @ 0.53%	Wedge Fault @ 63m.

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DRILLING SECTION	HOLE No.	BEARING I. S. G. (o)	INCLINATION (o)	TOTAL DEPTH (m)	MINERALIZATION (WO ₃)	REMARKS
	D200 /3	360	-60	81.15	B lens: 1-5m, 4m @ 0.54% C lens: 44-61m, 17m @ 0.75%	Wedge Fault @ 41.8m
220240E	D240 /1	360	-60	92.61	B lens: 12-15m, 3m @ 0.63% C lens: 33-46m, 13m @ 1.68% 51-60m, 9m @ 1.01% 62-72m, 10m @ 0.55%	
	D240 /2	180	-90	100.41	C lens: 25-45m, 20m @ 1.80% 49-67m, 18m @ 0.90%	
	D240 /3	180	-70	94.94	C lens: 26-76m, 50m @ 0.98%	
	D240 /4	360	-39	107.62	B lens: 16-19m, 3m @ 0.60% C lens: 35-37m, 2m @ 2.72% 52-84m, 32m @ 1.35% 88-92m, 4m @ 0.89%	
	D240 /5	180	-55	172.90	C lens: 43-73, 30m @ 1.68% 80-117m, 37m @ 2.01% 145-151m, 6m @ 0.82%	Wedge Fault (?)



LEGEND:

- Main mineralization
- Mineralized breccias
- Dykes
- Pyritic ground material
- Other faults
- Other faults

159025

DDH 196 Projected position at -75m RL

5 cm

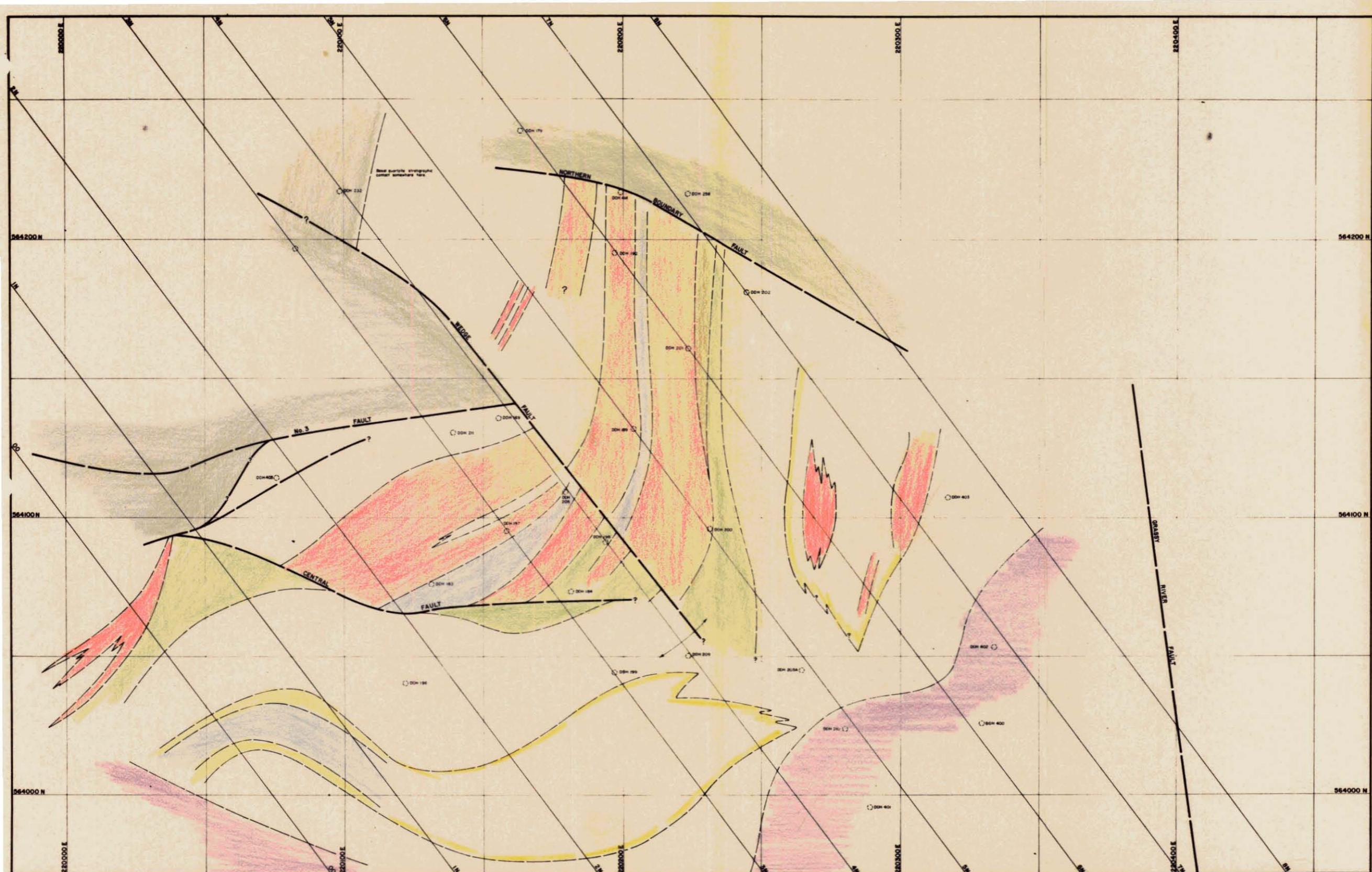
ISG REFER REPORT 70-0676

GEOPEKO LIMITED
KING ISLAND GROUP

No. KG2-69

DOLPHIN MINE
GEOLOGICAL LEVEL PLAN
-75m RL.

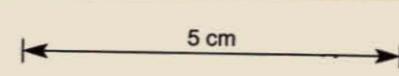
DATE: JULY, 1974
GEOLOGIST: M.J.D.
DRAWN BY:
CHECKED: M.C.A.



Legend

	Shale		Shale		Strike and dip		Projected position of -125m RL
	Shale with quartzite		Shale with quartzite		Joint, normal		
	Shale with quartzite		Shale with quartzite		Joint, vertical		
	Shale with quartzite		Shale with quartzite		Fault		
	Shale with quartzite		Shale with quartzite		Degree of uncertainty in fault position		
	Shale with quartzite		Shale with quartzite				

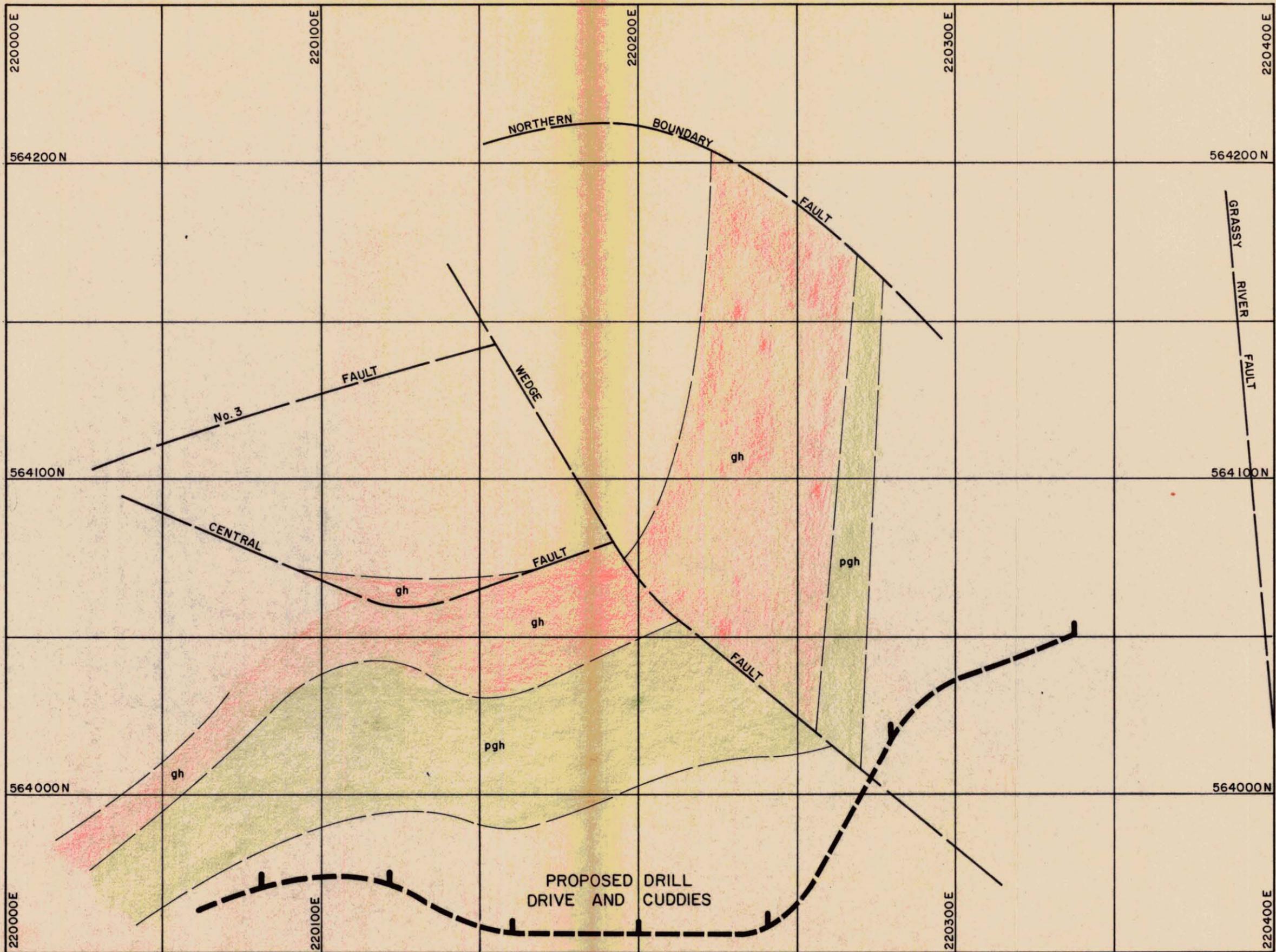
159026



ISG REFER REPORT 70-0676

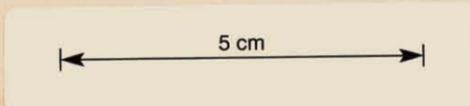
DATE: MAR 1974
 DRAWN BY: M.A.S.
 CHECKED BY: M.C.A.

GEOPEKO LIMITED
 1000 ISLAND GROUP
 No. KG2-71
 DOLPHIN MINE
 GEOLOGICAL LEVEL PLAN
 -125m RL

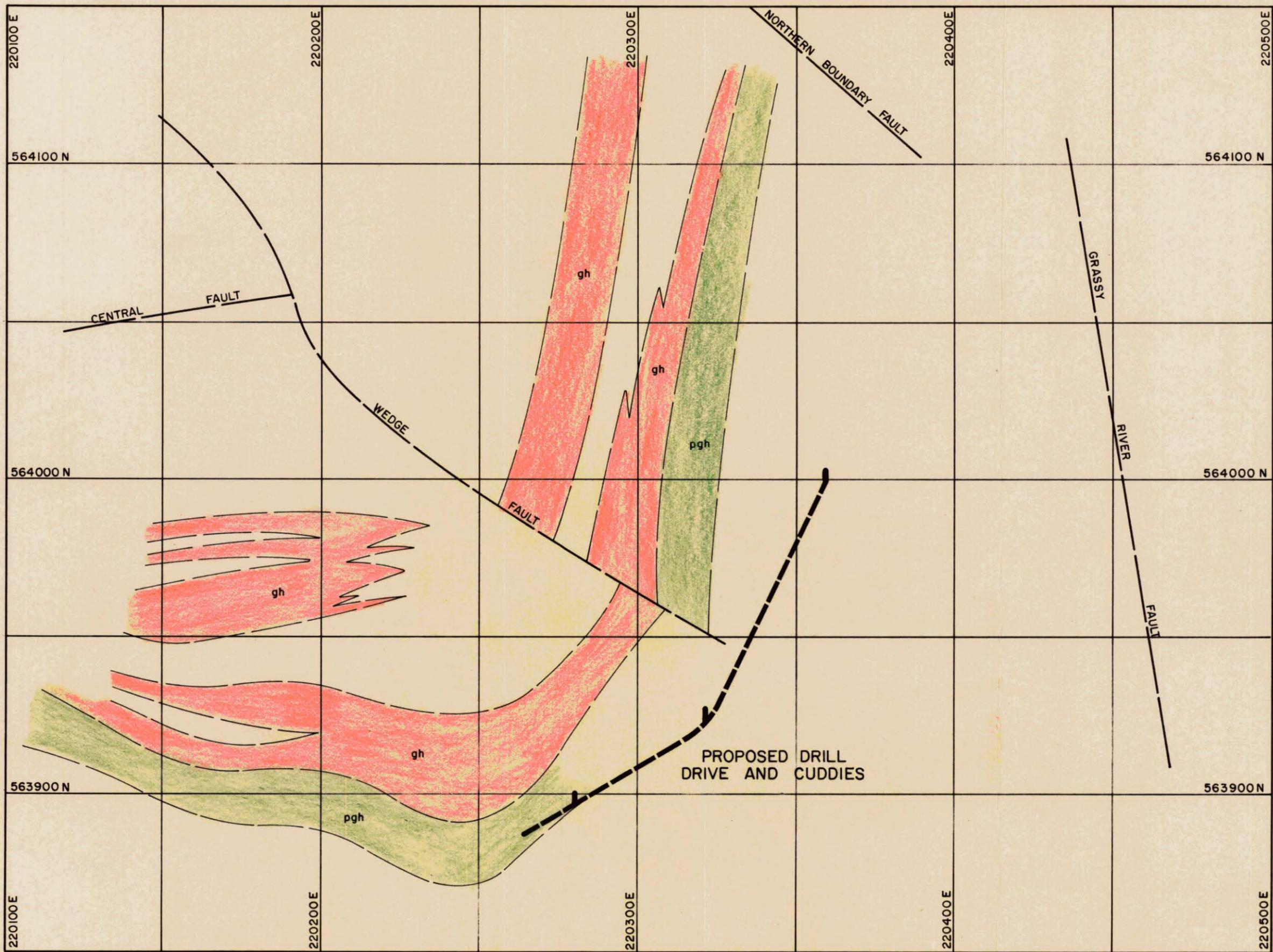


159027

DOLPHIN OREBODY
 -150m.R.L.
 Proposed Drill Drive and D.D.H. Cuddy Locations



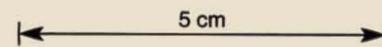
ISG REFER REPORT 70-0676



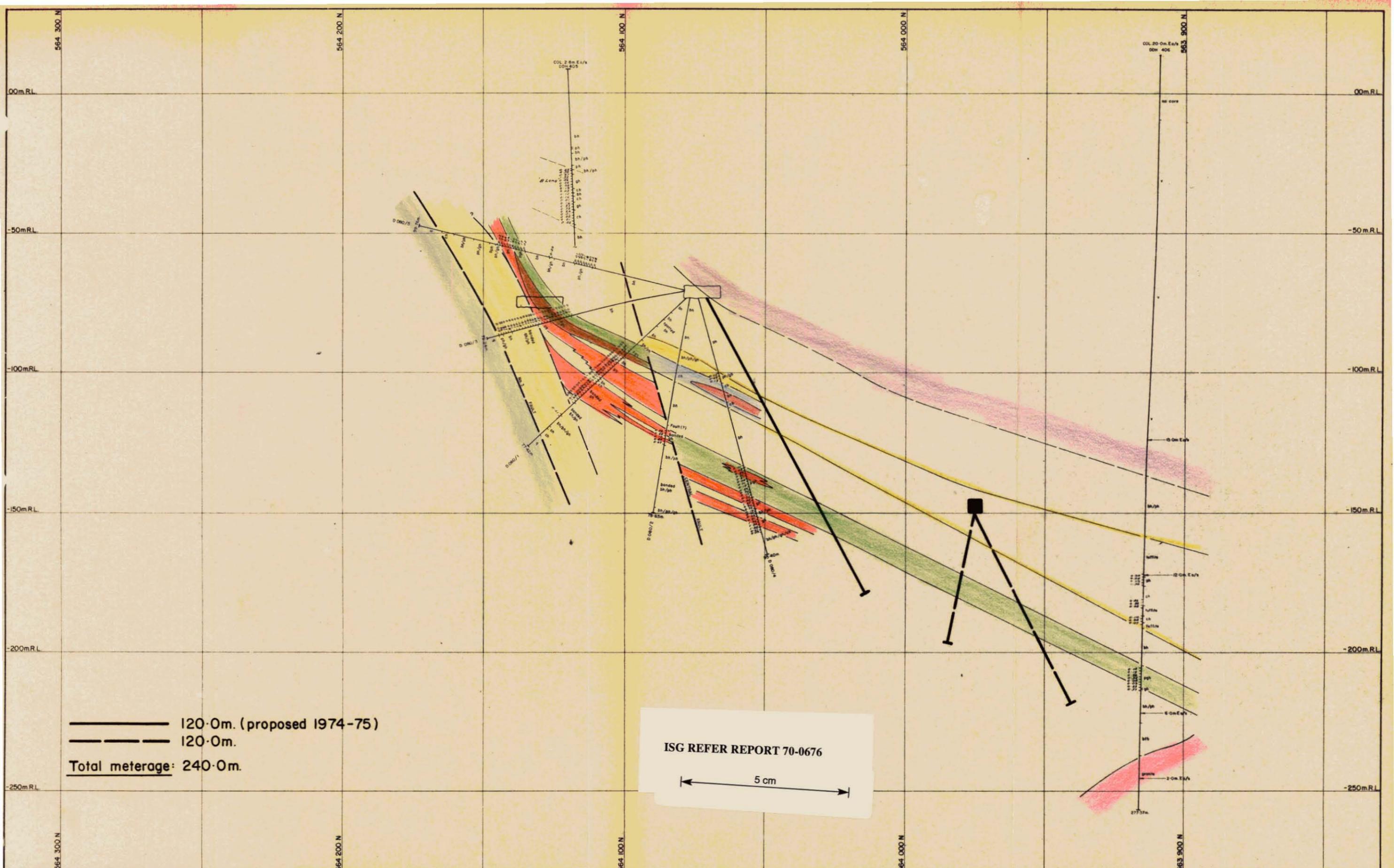
159028

DOLPHIN OREBODY
-200m.R.L.

Proposed Drill Drive and D.D.H. Cuddy Locations



ISG REFER REPORT 70-0676



——— 120.0m. (proposed 1974-75)
 - - - 120.0m.
 Total meterage: 240.0m.

ISG REFER REPORT 70-0676
 5 cm

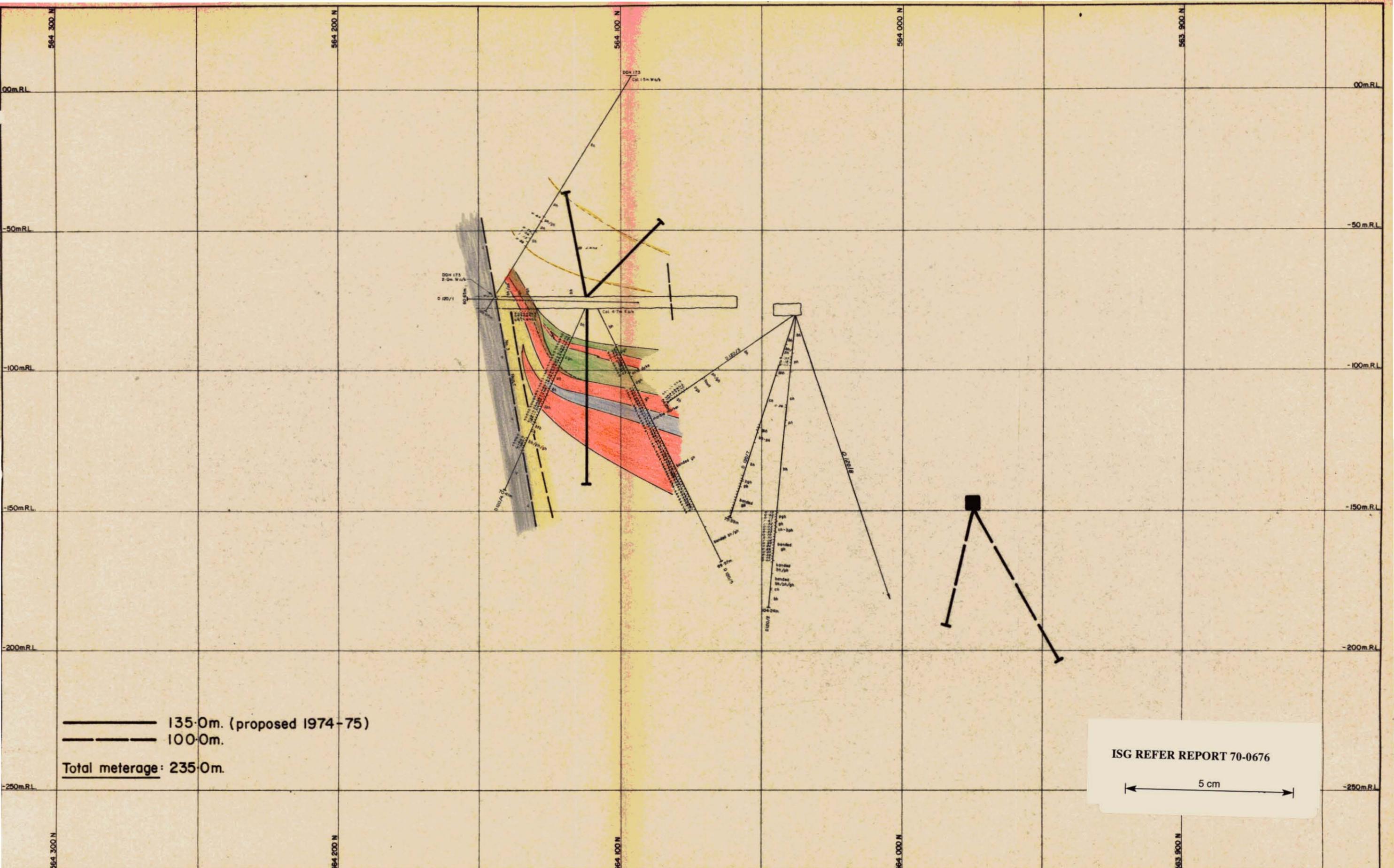
Legend:

- | | | | | | |
|--|--------------------------|--|-------------------------|--|--|
| | Upper metavolcanics | | Banded footwall beds | | Strike and dip |
| | Banded hornfels | | Biotite gneiss hornfels | | Joint, inclined |
| | Marble | | Lower metavolcanics | | Joint, vertical |
| | Biotite hornfels | | Quartzite | | Fault |
| | Pyroxene garnet hornfels | | Apatite | | Degree of uncertainty in Fault position |
| | Garnet hornfels | | | | Direction of bedding with respect to core axis |

RQD Rock Quality Designator
 J/M Joints per Metre of recovered core
 RQD %
 >80 Minimum or no support
 60-80 Intermediate support, rockbolts and one shotcrete application
 <60 Maximum support
 (after E. Miller; March, 1972)

159029

GEOPEKO LIMITED KING ISLAND GROUP	
	No. KG2-121
DOLPHIN MINE GEOLOGICAL CROSS-SECTION 220 080 E	
DATE: APRIL, 1974 GEOLOGIST: M.J.G. DRAWN: R.F. CHECKED: W.C.R.	



——— 135 Om. (proposed 1974-75)
 - - - 100 Om.
 Total meterage: 235 Om.

ISG REFER REPORT 70-0676
 5 cm

- Legend:**
- Upper metatronics
 - Banded hornfels
 - Marble
 - Biotite hornfels
 - Pyroxene garnet hornfels
 - Garnet hornfels
 - Banded foliated base
 - Biotite pyroxene hornfels
 - Lower metatronics
 - Quartzite
 - Aplite
 - Strike and dip
 - Joint, inclined
 - Joint, vertical
 - Fault
 - Degree of uncertainty in Fault position
 - Direction of bedding with respect to core axis

159030

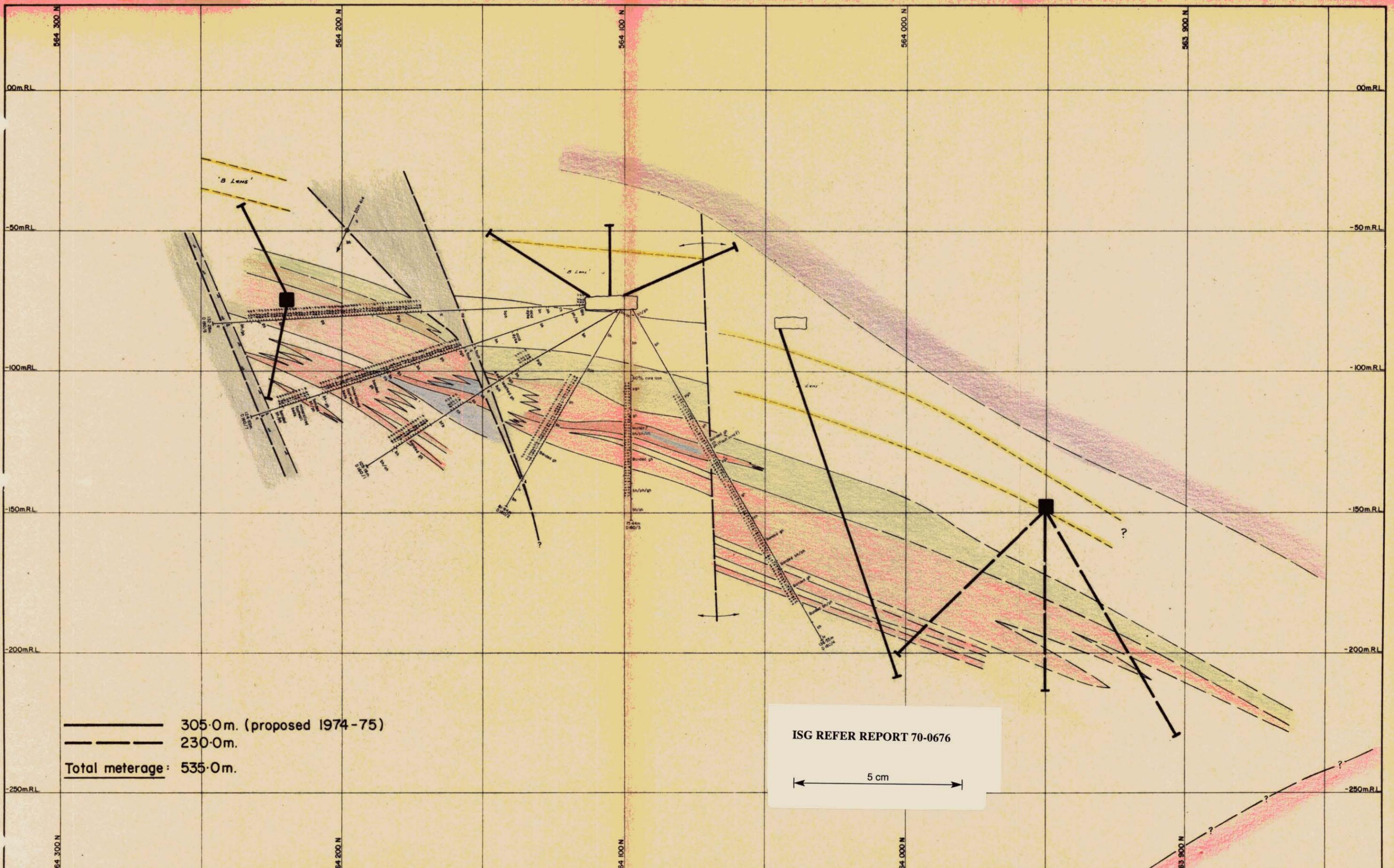
RQD Rock Quality Designator
 J/M Joints per Metre of recovered core
 50% Minimum or no support
 60-90 Intermediate support; rockbolts and one shotcrete application
 <80 Maximum support
 (after E. Miller; Marsh, 1972)

DATE: APRIL, 1974
 GEOLOGIST: M.J.D.
 DRAWN: R.F.
 CHECKED: M.C.R.

GEOPEKO LIMITED
 KING ISLAND GROUP

No. KG2/122

DOLPHIN MINE
 GEOLOGICAL CROSS-SECTION
 220 120 E



——— 305.0m. (proposed 1974-75)
 - - - 230.0m.
 Total metrage: 535.0m.

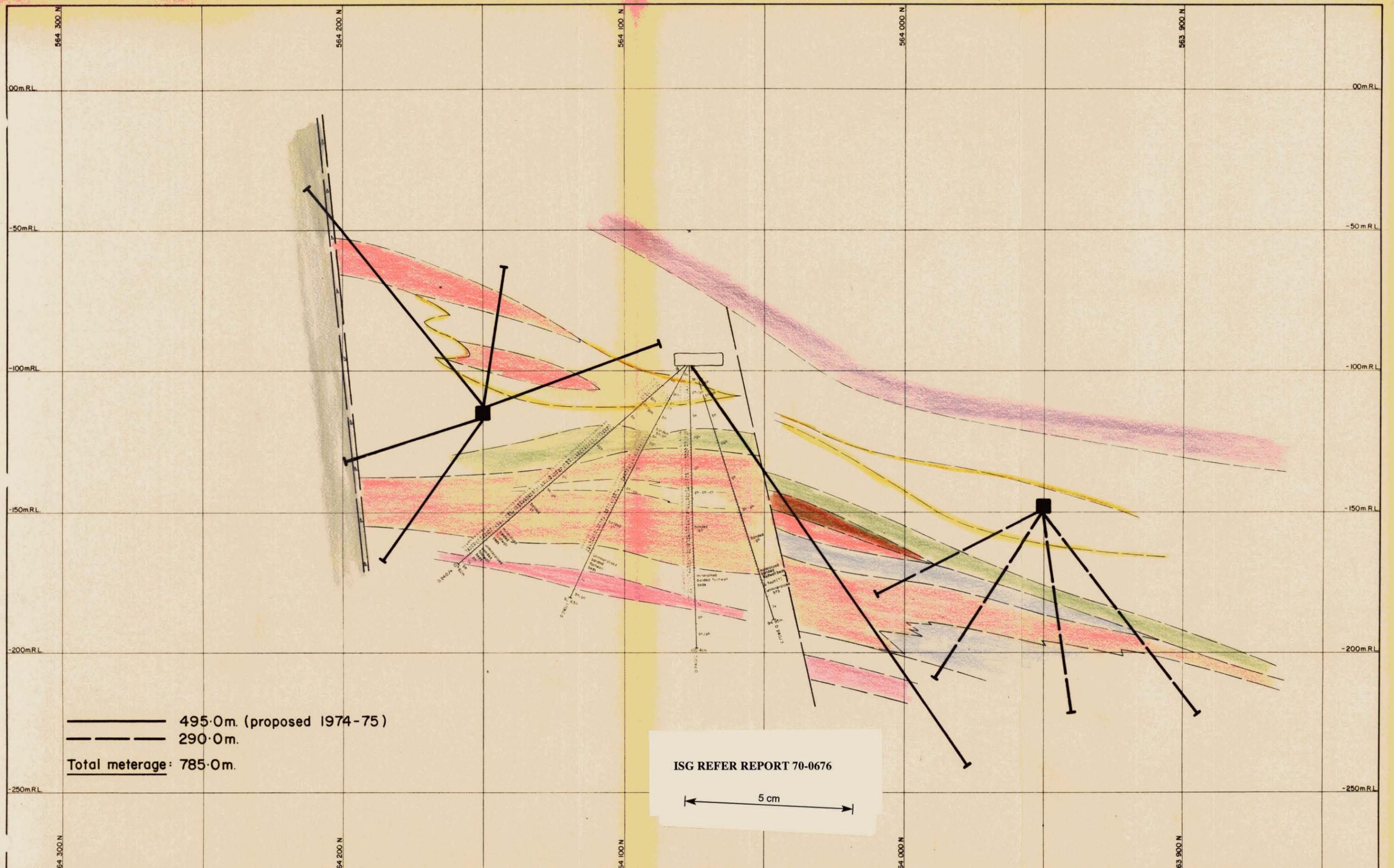
ISG REFER REPORT 70-0676
 5 cm

	Upper metvolcanics		Banded hornfels beds		50	Strike and dip
	Banded hornfels		Biotite pyroxene hornfels		35	Joint, inclined
	Marble		Lower metvolcanics		10	Joint, vertical
	Biotite hornfels		Quartzite			Fault
	Pyroxene garnet hornfels		Aplite			Degree of uncertainty in Fault position
	Garnet hornfels					Direction of bedding with respect to core axis

RQD Rock Quality Designator
 J/M Joints per Metre c/ recovered core
 RQD %
 >90 Minimum or no support
 80-90 Intermediate support, rockbolts and one shchells application
 <80 Maximum support
 (after E. Miller; March, 1972)

159031

GEOPEKO LIMITED KING ISLAND GROUP		No. KG2-127
SCALE: 1:500		
DOLPHIN MINE GEOLOGICAL CROSS-SECTION 220 160 E		
DATE: MAY, 1974		
GEOLOGIST: M.J.D.		
DRAWN: K.D.		
CHECKED: M.C.R.		



————— 495.0m. (proposed 1974-75)
 - - - - - 290.0m.
Total meterage: 785.0m.

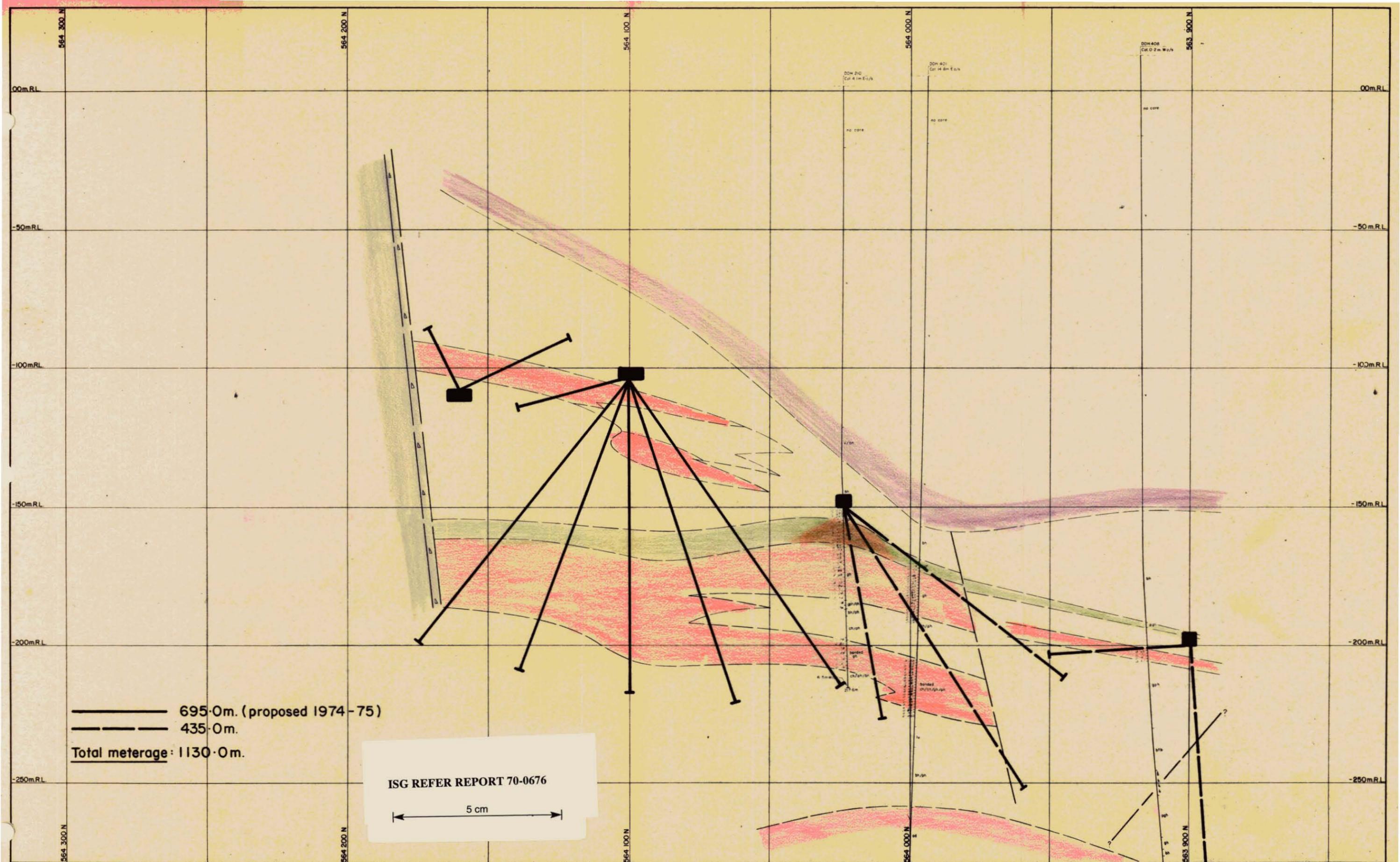
ISG REFER REPORT 70-0676
 5 cm

Legend:	
	Upper metavolcanics
	Banded hornfels
	Marble
	Pyroxene garnet hornfels
	Garnet hornfels
	Banded footwall beds
	Biotite pyroxene hornfels
	Lower metavolcanics
	Quartzite
	Splite
	Strike and dip
	Joint, inclined
	Joint, vertical
	Fault
	Degree of uncertainty in Fault position
	Direction of bedding with respect to core axis

RQD: Rock Quality Designator
 J/M: Joints per Metre of recovered core
 RQD %:
 100 Maximum or no support
 80-90 Intermediate support, rockbolts and one shotcrete application
 40 Maximum support
 (after E. Miller, March, 1972)

159033

	GEOPEKO LIMITED	
	KING ISLAND GROUP	
DATE AUG., 1974	No. KG2-130	
GEOLOGIST M.J.D.	DOLPHIN MINE	
DRAWN R.F.	GEOLOGICAL CROSS-SECTION	
CHECKED M.C.R.	220 240 E	



———— 695·0m. (proposed 1974-75)
 - - - - - 435·0m.
Total meterage: 1130·0m.

ISG REFER REPORT 70-0676
 ← 5 cm →

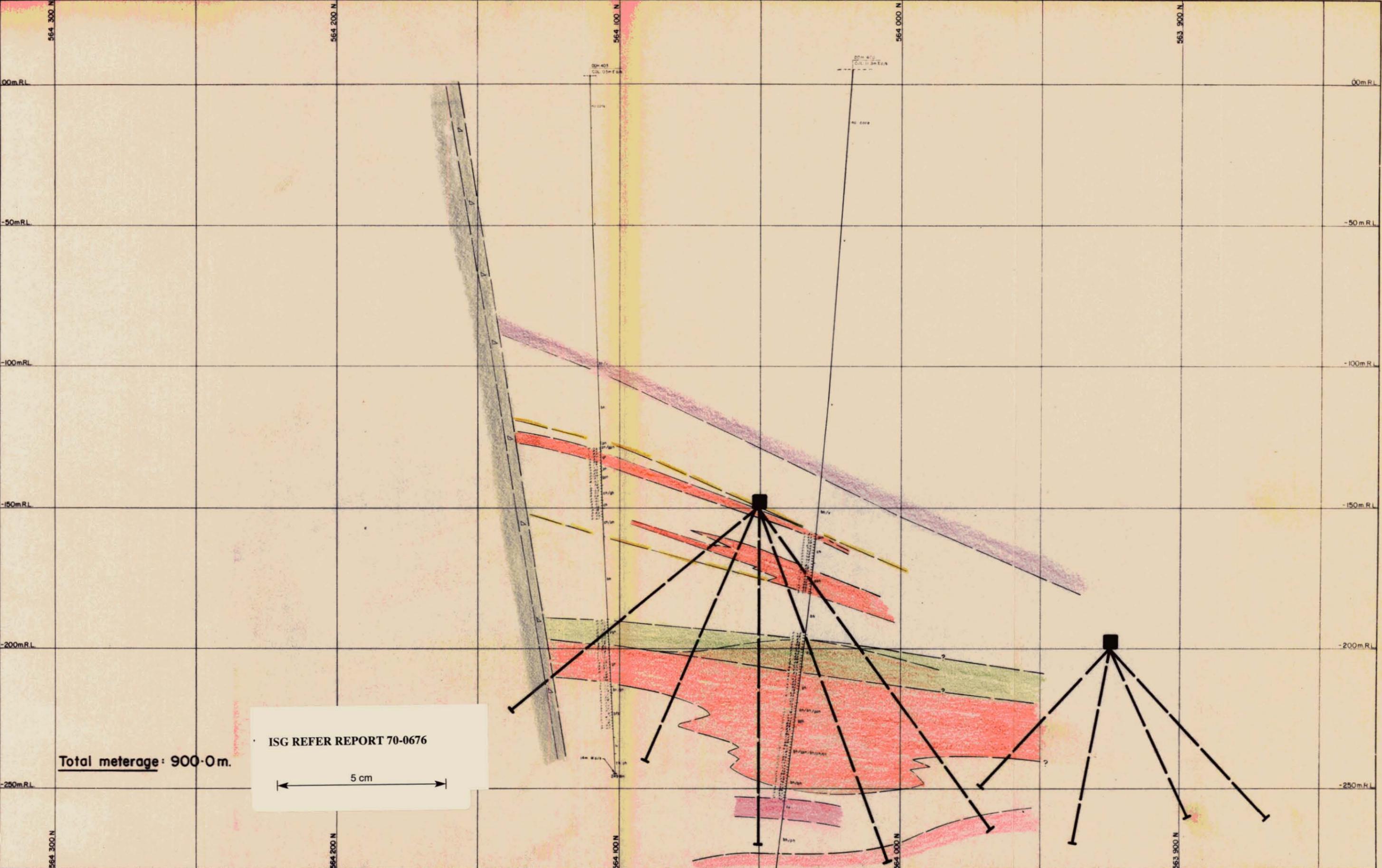
- Legend:**
- | | | | |
|--|--------------------------|--|--|
| | Upper metavolcanics | | Strike and dip |
| | Banded hornfels | | Joint, inclined |
| | Banded pyroxene hornfels | | Joint, vertical |
| | Marble | | Fault |
| | Biotite hornfels | | Degree of uncertainty in fault position |
| | Pyroxene garnet hornfels | | Direction of bedding with respect to core axis |
| | Garnet hornfels | | |

RQD Rock Quality Designator
 J/M Joints per Metre of recovered core

RQD %
 >90 Minimum or no support
 80-90 Intermediate support; rockbolts and one shotcrete application
 <80 Maximum support
 (after E. Miller, March, 1972)

159034

GEOPEKO LIMITED
 KING ISLAND GROUP
 No. KG2-131
 SCALE: 1:500
 DATE: AUG, 1974
 GEOLOGIST: M.J.D.
 DRAWN: R.F.
 CHECKED: M.C.R.
DOLPHIN MINE
GEOLOGICAL CROSS-SECTION
220 280 E

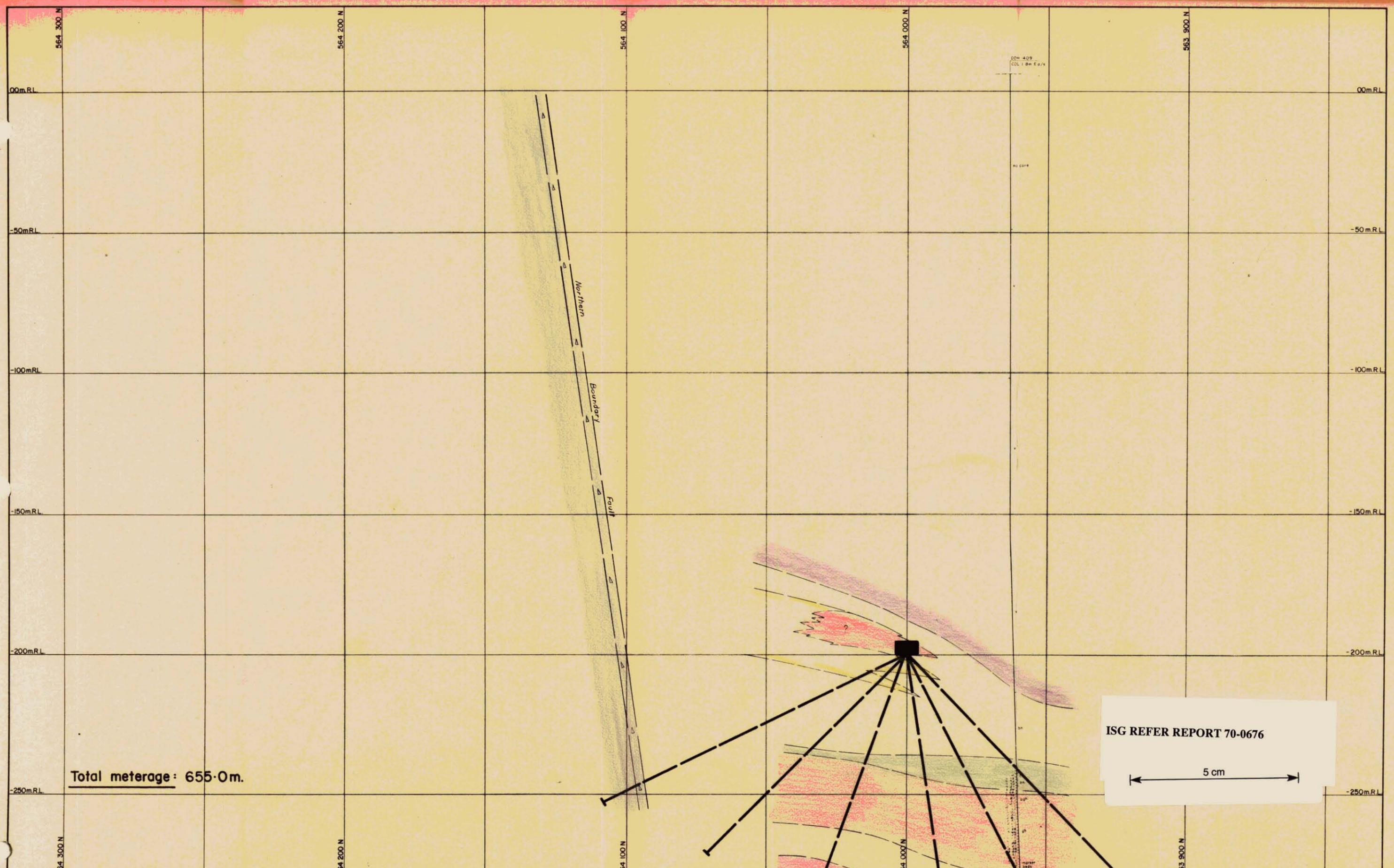


ISG REFER REPORT 70-0676

5 cm

Total meterage: 900-0m.

<p>Legend:</p> <ul style="list-style-type: none"> Upper metachalves Banded footwall beds Banded hornfels Biotite pyroxene hornfels Marble Lower metachalves Biotite hornfels Quartzite Pyroxene garnet hornfels Aplite Garnet hornfels 	<ul style="list-style-type: none"> Strike and dip Joint, inclined Joint, vertical Fault Degree of uncertainty in fault position Direction of bedding with respect to core axis 	<p>RQD Rock Quality Designator</p> <p>J/M Joints per Metre of recovered core</p>	<p>RQD %</p> <p>>90 Minimum support</p> <p>80-90 Intermediate support, rockbolts and one shotcrete application</p> <p><80 Maximum support</p> <p>(after S. Mills, 1972)</p>	<p>159035</p>	<p>GEOPEKO LIMITED KING ISLAND GROUP</p> <p>SCALE 1:500</p> <p>No. KG2-132</p> <p>DOLPHIN MINE GEOLOGICAL CROSS-SECTION 220 320 E</p>	<p>DATE AUG, 1974</p> <p>GEOLOGIST M.J.D.</p> <p>DRAWN B.F.</p> <p>CHECKED M.C.R.</p>
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Total meterage: 655.0m.

- Legend:**
- Upper metavolcanics
 - Banded hornfels
 - Marble
 - Biotite hornfels
 - Pyroxene garnet hornfels
 - Garnet hornfels
 - Banded footwall beds
 - Biotite pyroxene hornfels
 - Lower metavolcanics
 - Quartzite
 - Aplite
 - Strike and dip
 - Joint, inclined
 - Joint, vertical
 - Fault
 - Degree of uncertainty in Fault position
 - Direction of bedding with respect to core axis

RQD Rock Quality Designator
 J/M Joints per Metre of recovered core
 RQD %
 <30 Minimum or no support
 30-50 Intermediate support, rockbolts and one shotcrete application
 >50 Maximum support
 (after E. Miller, March, 1972)

159036

ISG REFER REPORT 70-0676

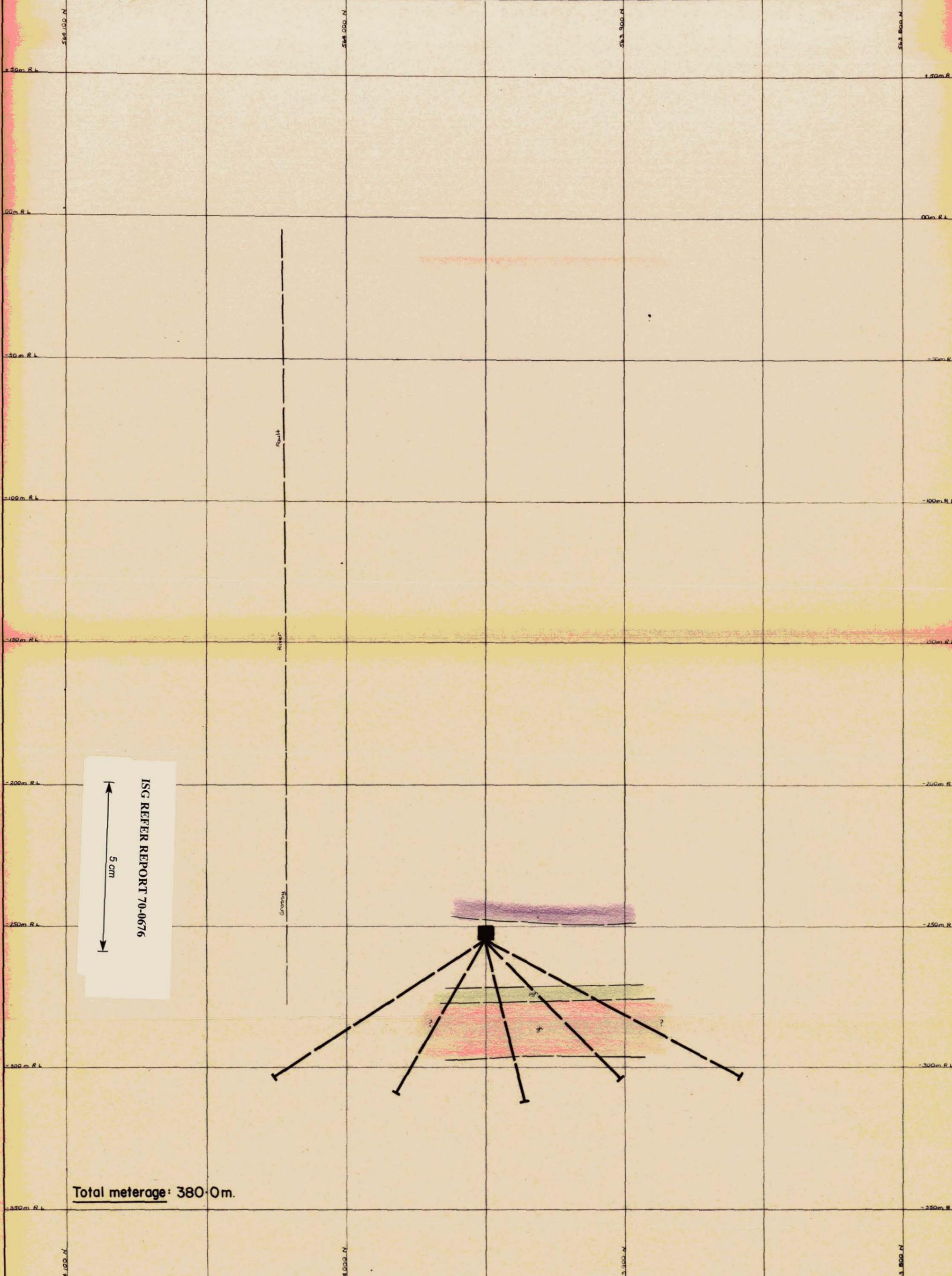
5 cm

GEOPEKO LIMITED
KING ISLAND GROUP

No. KG2- 133

DOLPHIN MINE
GEOLOGICAL CROSS-SECTION
220 360 E

DATE AUG, 1978
 GEOLOGIST W.J.D.
 DRAWN R.F.
 CHECKED M.C.R.



Total meterage: 380.0m.

ISG REFER REPORT 70-0676
5 cm

DATE AUG. 1974
GEOLOGIST M.J.D.
DRAWN R.F.
CHECKED M.C.R.

GEOPEKO LIMITED
KING ISLAND GROUP
No. KG2-134
SCALE: 1:500

159037

DOLPHIN MINE
GEOLOGICAL CROSS-SECTION
220 400 E

GEOPEKO LIMITED

KING ISLAND

Ore Resource Table Dolphin Orebody - 'C Lens'

(3-9-74)

	219880E	219920E	219960E	220000E	220040E	220080E	220120E	220160E	220200E	220240E	220280E	220320E	220360E	220400E	Grassy River Fault	TOTAL	CUMULATIVE TOTAL
00 R.L.				9,700	16,900	10,700										37,300	37,300
	275,000		0.65				40,000	23,000								338,000	338,000
-75m.R.L.				10,300	23,000	31,500	5,900									70,700	108,000
	101,000		0.62				60,000	60,000								221,000	559,000
-100m.R.L.				24,600	20,200	82,700	107,700									235,200	343,200
	25,000		0.59				22,000	371,000		1.08						418,000	977,000
-125m.R.L.				19,400	41,200	42,900	95,300									198,800	542,000
					15,000	10,000		600,000		0.89						625,000	1,602,000
-150m.R.L.																	542,000
					22,000	97,000	294,000	1,865,000					0.96			2,278,000	3,880,000
								300,000								300,000	300,000
-200m.R.L.																	542,000
below -200m.R.L.							17,000	1,491,000						1.24		1,508,000	5,388,000
								700,000								700,000	1,000,000

C Lens Proven Ore Resource Tonnes at Grade %WO ₃	542,000	1.20
C Lens Probable Ore Resource Tonnes at Grade %WO ₃	5,388,000	1.00
C Lens Possible Ore Resource Tonnes	1,000,000	

DOLPHIN OREBODY SUMMARY

PROVEN ORE RESOURCE:

C LENS 542,000 TONNES at 1.20% WO₃

PROBABLE ORE RESOURCE

C LENS 5,388,000 T. at 1.00%] 6,180,100 TONNES at 1.01% WO₃
 B LENS (21-8-73) 792,100 T. at 1.12%

POSSIBLE ORE RESOURCE

C LENS 1,000,000 T.] 1,176,000 TONNES
 B LENS (21-8-73) 176,000 T.

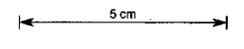
TOTAL PROVEN AND PROBABLE ORE RESOURCE 6,722,100 TONNES at 1.02% WO₃

NOTE:

Method of grade calculation: modified polygonal method of weighted arithmetic means.
 Method of tonnes calculation: truncated cone formula.

ISG REFER REPORT 70-0676

SCALE: 1:1000
 COMPILED BY: M.J.D.
 DRAWN BY: R.F.
 CHECKED BY: M.C.R.
 DATE: SEPT., 1974



159033

93-3473