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PEKO WALLSEND OPERATIONS LIMITED

GEOPEKO DIVISION

KING ISLAND

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GEOLOGICAL REVIEW - DOLPHIN OREBODY

OCTOBER, 1978

by

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LIST OF PLANS

Ore Resource Table (29-8-78)

In attached folder:-

Geological Cross Section	220 000 E
" " "	220 020 E
" " "	220 040 E
" " "	220 080 E
" " "	220 120 E
" " "	220 140 E
" " "	220 160 E
" " "	220 180 E
" " "	220 200 E
" " "	220 240 E
" " "	220 260 E
" " "	220 280 E
" " "	220 320 E
" " "	220 340 E
" " "	220 360 E

Geological Long Section	563 850 N
" " "	563 900 N
" " "	563 950 N
" " "	564 000 N
" " "	564 050 N
" " "	564 100 N
" " "	564 150 N
" " "	564 200 N

Geological Level Plan	-50 m. R.L.
" " "	-60 m. R.L.
" " "	-70 m. R.L.
" " "	-80 m. R.L.
" " "	-90 m. R.L.

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Geological Level Plan	-100 m. R.L.
" " "	-110 m. R.L.
" " "	-120 m. R.L.
" " "	-130 m. R.L.
" " "	-140 m. R.L.
" " "	-150 m. R.L.
" " "	-160 m. R.L.
" " "	-170 m. R.L.
" " "	-180 m. R.L.
" " "	-190 m. R.L.
" " "	-200 m. R.L.
" " "	-210 m. R.L.
" " "	-220 m. R.L.
" " "	-230 m. R.L.
" " "	-240 m. R.L.
" " "	-250 m. R.L.
" " "	-260 m. R.L.
" " "	-270 m. R.L.
" " "	-280 m. R.L.
" " "	-290 m. R.L.
" " "	-300 m. R.L.

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INTRODUCTION

The Dolphin Mine has been in operation since June 1973 and the main decline has now been developed to the -256 m. R.L. Production stopes are well developed in each of the Wedge, Central and Pit areas to meet an annual production budget of 261,600 tonnes.

The C lens oreblocking program has continued eastward at 20 m intervals from section 220 320 E to 220 360 E and is only partially complete. A total of 4.26 million tonnes of ore has been proved. Present diamond drilling is further defining ore along the above sections as well as testing for mineralization east of the Decline Fault.

This report reviews the progress since the preceeding review report (Danielson, October 1977) in so far as it affects the geology.

SUMMARY

The underground oreblocking program is continuing and to date 174 holes have been completed for 15,077 m. Drilling budgeted for the present year is 4,665 m of which 712 m has been completed.

The present underground drilling program has proved 4,258,500 tonnes at 1.15% WO_3 . The total Proven and Probable ore resource of Dolphin is 5,475,500 tonnes at 1.10% WO_3 . A further 345,000 tonnes is classified as Possible.

There has been a decrease of approximately 117,000 tonnes of C lens Proven and Probable ore since the October 1977 calculation due entirely to the affects of the Decline and Grassy River Faults on the eastern extremity of the Wedge area.

The B lens resource has decreased by 204,000 tonnes to 463,000 tonnes at 0.83% WO_3 due to oreblocking diamond drilling since the last calculation in 1975. The resource remains classified as Probable.

The major faults within Dolphin (Wedge, Central, Swan, No. 3, Northern Boundary and Decline Faults) are interpreted to extend to the surface and hence immediately underline the reclaimed areas of Grassy Bay.

The steepening of dips in the Wedge area from 30 - 50° (-125 m. R.L.) to 50 - 70° (below -260 m. R.L.) is attributed purely to the Decline Fault.

The possible? Grassy River Fault has been intersected in 3 skew holes east of the Decline Fault. The fault has at least a 9 m breccia zone, strikes approximately NS and dips to the west from 75 - 80°. Volcanics are interpreted to lie on the eastern side of the fault.

The computer group is now providing grade and tonnage estimates for the working lift and the two lifts immediately above in all stoping areas. Block grade predictions in the Wedge and Central areas are approaching an acceptable level of accuracy, while in the Pit area appear to be slightly underestimated.

Total production ex Dolphin Mine from the commencement of mining operations to August 29th, 1978, is 787,487 tonnes at 0.91% W_{O_3} .

CONCLUSIONS

The basic structure of the Dolphin mine series is a block faulted structure defined by the six major faults - the Swan, Central, Wedge, Northern Boundary, No. 3 and Decline Faults. All the faults have been defined from mine openings and diamond drilling.

The irregular nature of B lens mineralization will necessitate the continuation of the close spaced (20 m) drilling program to provide adequate definition for mining purposes.

The C lens oreblocking program, proposed for the current year will completely define the 'bottom' of the mine as well as test the area east of the Decline and ?Grassy River Faults.

The Decline Fault is not expected to affect C lens Wedge stoping operations above the -200 m. R.L. Below this level the fault lies in the immediate hangingwall of the C lens stoping areas where ground conditions are anticipated to be poor.

RECOMMENDATIONS

It is recommended that the diamond drilling program approved at the April Technical Meeting 1978 be completed.

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ACTION SHEET

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GEOLOGY REVIEWMain Decline

The main decline has now advanced to the -256 m. R.L.

In the period under review the main decline advanced some 190 m in banded biotite hornfels/pyroxene hornfels, banded footwall beds and lower metavolcanics. Minor low grade development ore occurred in the banded footwall beds. Steel setting was required along the majority of the banded biotite hornfels/pyroxene hornfels underlying the lower metavolcanics where ground conditions were poor. No steel setting was required in the lower metavolcanics.

B lens

Approximately 50 m of development took place in B lens marbles along S13. Ore production was 546 tonnes at 0.5% WO_3 . Steel setting was required for the first 15 m into B lens where numerous large faults in association with the Decline Fault are present. Steel setting was also required in the drill cuddy along 220 360 E which is interpreted to lie between the Decline Fault and the ?Grassy River Fault.

C lens Pit Area(1) -75 m. R.L.

No further work here

(2) Stoping Area -137 m. to -155 m. R.L.

Access to this stoping area is still the J16 ramp.

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Total stope production has been as follows:-

	<u>Upper C</u>	<u>Lower C</u>
Benching/Undercut 1st and 2nd lifts	24,829 tonnes @ 1.52% WO ₃	34,534 tonnes @ 0.76% WO ₃
3rd lift	19,790 tonnes @ 0.91% WO ₃	11,620 tonnes @ 0.71% WO ₃
4th lift	19,910 tonnes @ 0.90% WO ₃	2,289 tonnes @ 0.41% WO ₃

The Pit area is structurally more complex than other present working areas in Dolphin Mine. Numerous faults have been intersected, the majority of which appear to be orientated in a NW-SE direction. The faults have caused localized block failure especially adjacent to the larger Swan Fault. The frequency of block failure is expected to decrease as the stoping area decreases in size and dip of the orebody increases.

(3) Pit Stope Access (Q11)

The Q11 drive off the main decline at approximately the -235 m. R.L. is designed to provide access to the bottom of the Pit Orebody located between the Central and Swan Faults. The access drive has advanced 20 m within banded biotite hornfels/pyroxene hornfels and is expected to pass through the Wedge and Central Faults. Poor ground conditions have necessitated steel setting.

(4) Pit Stope Ramp Access (N13)

The N13 Pit Stope ramp access advanced 50 m under the period of review (off the main decline at the -187 m. R.L.). The access drive appears to have passed through the Cuckoo and Central Faults within partly mineralized banded footwall beds. Total production amounted to 707 tonnes at 0.71% WO₃.

C lens Central Area

(1) -75 m. R.L.

No further work here

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(2) Access ramp to -125 m. R.L. (H15)

This ramp was designed to enable access to the Central stoping area once access is lost via M17.

Development proceeded approximately 75 m in strongly jointed biotite hornfels due to the close proximity of the Central Fault. The drive passed through the Central Fault into medium grade banded Lower C lens. Ground conditions have been poor. Ore production amounted to 523 tonnes @ 0.49% WO_3 .

(3) Access ramp to -104 m. R.L. (O16)

This ramp is designed to enable access to the Central stoping area once access is lost via H15.

Present development has proceeded approximately 25 m in mineralized pyroxene garnet hornfels and biotite hornfels. The Wedge Fault with associated shearing and brecciation was also intersected. Ore production amounted to 140 tonnes at 0.70% WO_3 .

(4) Stoping Area -125 m. to -150 m. R.L.

Stoping operations have continued in this area and the sixth lift above the 150 m. R.L. undercut has commenced taking the backs to a maximum elevation of -125 m. R.L.

A summary of production to date is set out with resource grades in parentheses.

	<u>Upper C lens</u>		<u>Lower C lens</u>	
	<u>Tonnes</u>	<u>Grade % WO_3</u>	<u>Tonnes</u>	<u>Grade % WO_3</u>
-150m Undercut	2,283	1.12 (1.81)	16,062	0.80 (0.84)
1st lift	3,285	1.71 (1.81)	11,187	0.78 (0.84)
2nd lift	3,542	1.25 (1.81)	7,164	0.75 (0.84)
3rd lift	6,531	0.90 (1.81)	15,793	0.79 (0.84)
4th lift	3,721	1.03 (1.81)	16,845	0.77 (0.84)
5th lift	4,431	0.92 (1.81)	22,557	0.73 (0.84)
6th lift*	1,392	1.80 (1.81)	9,220	0.90 (0.84)

*lift incomplete

The overall resource grade for the original block from -150 m. to -125 m. R.L. was 1.00% WO_3 .

The geology for the Central area has been changed quite significantly since the previous review report (Danielson, 1977) and appears to account for the lower production grades. Of significance is the presence of the Cuckoo Fault running parallel to the Central Fault with south block down thrown some 20 m. This has effectively displaced the majority of Upper C lens ore with biotite hornfels and pyroxene garnet hornfels. (See section 220160 E) and means a substantially higher proportion of Lower C lens ore is mined compared to Upper C lens ore.

C lens Wedge Area

(1) Above -75 m. R.L.

No further work here.

(2) -98 m. R.L.

Minor development work to gain access to Wedge stoping area above the seventh lift.

(3) Stoping area -101 m. to -130 m. R.L.

Stoping operations have continued in this area and the eighth lift above the -130 m. R.L. undercut is almost complete taking the backs to a maximum elevation of -101 m. R.L.

A summary of production to date is set out with resource grades in parentheses.

	<u>Upper C lens</u>		<u>Lower C lens</u>	
	<u>Tonnes</u>	<u>Grade % WO₃</u>	<u>Tonnes</u>	<u>Grade % WO₃</u>
-130m undercut	39,950	1.19 (1.36)	31,464	0.69 (0.72)
1st lift	26,846	1.01 (1.28)	17,331	0.61 (0.70)
2nd lift	17,594	1.07 (1.28)	15,710	0.68 (0.70)
3rd lift	18,892	1.01 (1.28)	15,112	0.67 (0.70)
4th lift	21,611	1.12 (1.28)	14,748	0.69 (0.70)
5th lift	19,677	0.94 (1.28)	14,787	0.93 (0.70)
6th lift	15,283	1.14 (1.28)	13,005	0.78 (0.70)
7th lift	14,033	1.04 (1.28)	16,694	0.73 (0.70)
8th lift*	4,990	1.12 (1.28)	14,466	0.78 (0.70)

*lift incomplete

Production grades in Upper C lens have continued to be below the ore resource grade whereas there has been good correlation in Lower C lens. The over estimation in Upper C lens appears to be due to the fact that mineralization in the hangingwall pyroxene garnet hornfels is not as continuous as indicated from diamond drilling.

The geology has been much as anticipated except for a major fault which bisects the orebody with south block down some 5 - 8 m. This fault, together with numerous smaller parallel faults, could cause ground stability problems on approaching the proposed sill pillar beneath the old -75 m. R.L. workings.

(4) -240 m. R.L.

Geology along the S9 and S10 diamond drill drives has been as expected with an advancement of 60 m in S10 and 58 m in S9.

The S9 was designed to provide diamond drill sites along 563900 N for final definition of the Wedge and Southern areas. The drive passed through the Wedge and Swan Faults and is at present in B lens marbles of the Southern area.

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The S10 drive advanced through the Wedge orebody to section 220340 E to provide oreblocking sites at 220320 E and 220340 E, as well as test for the Decline and Grassy River Faults.

Total ore production from S9 was 409 tonnes at 1.04% WO_3 . Ore production from S10 amounted to 3,949 tonnes at 0.98% WO_3 with the grade in Upper C lens averaging 1.33% WO_3 (2,244 tonnes).

(5) -250 m. R.L.

The T13 and T14 drives advanced 24 m and 25 m respectively and were designed to connect with the ventilation raise and man-way raise from the -200 m. R.L.

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DISCUSSION OF RESULTSStratigraphy

The continuation of the oreblocking program and the development of mine openings have so far confirmed the stratigraphy detailed by previous workers e.g. (Danielson, 1976) with a slight variation in the footwall sequence.

Development of the main decline below the -200 m. R.L. has shown three separate stratigraphic lower metavolcanic horizons to exist in the interval between the banded footwall beds and the basal quartzites where previously only one horizon had been recorded.

All stratigraphic units including upper metavolcanics and basal quartzites have now been intersected in mine openings.

The granite basement has not been intersected in mine openings but the main decline is expected to enter granite at approximately the -270 m. R.L.

Structure/Faulting

Stoping operations are now in progress in the Wedge area above the -130 m. R.L. and in the Pit and Central areas above the -150 m. R.L. Mine openings have continued to confirm the general strike and dip of strata and together with recent diamond drilling results have clarified some of the fault interpretation.

The basic structure of the Dolphin mine series is a block-faulted structure, and not an anticlinal nose plunging southeast at 30° as described by Danielson (1974, 1975, 1976). The various blocks are defined by the major faults:-

Wedge area: defined by Wedge, Decline and North Boundary Faults
Central area: defined by Central, No. 3, Wedge and Decline Faults
Pit area defined by Central and Swan Faults
Southern area: defined by Swan Fault and granite basement to the south.

Within each block, the units show abundant evidence of drag adjacent to the major faults with resulting poorer ground conditions.

The major faults within Dolphin are interpreted to extend to the surface and hence immediately underlie the reclaimed areas of Grassy Bay. The No. 3, Wedge and Northern Boundary Faults have been defined on the surface where exposed. The Swan Fault and the Decline Fault have both been defined to approximately the -75 m. R.L., and there appears little doubt that both these faults will extend to the surface. Thus, these faults are 'exposed' at the sea bed and are 'ideal' channelways for water should differential movement take place along these major faults as stoping operations continue. To date, water inflow has been recorded from the Decline Fault along its whole length.

The Swan Fault which was initially intersected in the Pit area C16 stope has now been shown from diamond drilling to extend eastward to 220320 E and most probably is truncated by the Decline Fault. The Swan Fault appears to be displaced some 20 m around section 220200 E. Movement on the fault has been shown to be approximately 50 m south block down and the thin, medium to high grade (approximately 3 - 6 m at 1.08% WO_3) ore horizon has been displaced below the -200 m. R.L. A proven and probable resource of some 300,000 tonnes is shown to be present. Drilling indicates that this horizon is truncated to the south by the adamellite basement.

The Central Fault is shown to extend to section 220280 E. It does not merge with the Wedge Fault as previously interpreted, but instead is truncated by the Swan Fault.

Diamond drilling has located a new orebody area called the 'Lower Central Area' which appears to be a down faulted portion of the main Central area. The Lower Central area is bounded by the Wedge, Central-Swan Faults and at an elevation of -230 m. to -260 m. R.L. A proven resource of some 25,000 tonnes at 1.25% WO_3 has been defined with a further possible 25,000 tonnes. The fault

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displacing the Central area has, as yet, not been located and the body remains open to the east and the west. Oreblocking drilling is scheduled for this year.

The Wedge Fault is shown to extend along its NW-SE strike and is truncated by the Decline Fault around 220350 E - 220360 E.

The Decline Fault, striking approximately N-S and dipping east from 55° to 90° , appears as one of the largest faults intersected underground to date. The fault has been intersected in numerous openings (-98 m. R.L., R13, S14 cuddy at -150 m. R.L., and S13 at the -200 m. R.L.) and in drill core along cross section 220280 E, 220320 E, 220340 E and long sections 563950 N, 563975 N and 564050 N. In most cases the fault exhibits a well developed breccia zone up to 2 m wide. Relative movement on the fault is difficult to determine exactly due to the unconformable upper volcanics but appears to be east block down.

The steepening of dips in the Wedge area from 30° - 35° (-125 m. R.L.) to 45° (-200 m. R.L.) to 50° - 70° (below -260 m. R.L.) is attributed purely to the Decline Fault which below the -250 m. R.L. dips from 80° - 90° to the east. The ore horizons, as well as the pyroxene garnet hornfels, appear to be dragged down the Decline Fault and drilling to date has not shown the units to be faulted.

Above the -200 m. R.L. the Decline Fault is not expected to affect C lens stoping operations. However, below the -200 m. R.L. the Decline Fault lies in the immediate hangingwall of the C lens stoping areas where ground conditions are anticipated to be poor. In order to maintain stope stability, some loss in mining reserves may be expected adjacent to the Decline Fault.

The Northern Boundary Fault truncates the Decline Fault in the north. The No. 3 and Northern Boundary Faults remain as previously reported.

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Drilling of a number of skew holes to the east of the Decline Fault has only recently intersected a breccia fault zone larger than the Decline Fault - interpreted to be the Grassy River Fault or an associated fault. The broken brecciated zone for this fault is at least 9 m wide.

The true width is unknown as none of the three holes drilled have fully penetrated the fault zone. The fault is interpreted to strike approximately N-S and dip to the west at 75° - 80° . The presence of abundant epidote in the brecciated material strongly suggests the presence of volcanics on the eastern side of the fault.

Apart from the major faults which define the ore blocks at Dolphin, a number of smaller faults have been intersected in underground openings and in drill core. The most significant of these include the Cuckoo Fault in the Central area, and the Shag Fault in the Pit area.

The Cuckoo Fault runs parallel to the Central Fault with south block down thrown some 20 m. In mine openings the fault appears to be rehealed with abundant pyroxene hornfels and drag of bedding is almost vertical. Ground conditions between the Central and Cuckoo Faults are poor with parallel joints and shears being often chlorite coated.

The Shag Fault in the Pit area is a major shallow dipping fault striking approximately NE-SW and dipping to the NW at 10° - 30° . The fault affectively bisects the Pit area with north blocked down faulted some 30 - 50 m. Ground conditions adjacent to this fault are expected to be poor, especially where the flat fault forms the immediate hangingwall of stoping areas. (Refer sections 220120 E, 220140 E, 220160 E).

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Ore Resource

In the period under review the total C lens Proven and Probable resource has been reduced from 5,441,500 tonnes at 1.07% WO_3 to 5,003,500 tonnes at 1.13% WO_3 .

During this period C lens ore mined has been 249,162 tonnes at 0.86% WO_3 and a further 72,000 tonnes has been written off the resource as locked in pillars or remained unmined to preserve stope stability.

Therefore the revised calculation represents an overall decrease in resource tonnage of 116,838 tonnes over the previous calculation which is due almost entirely to the affects of the Decline and Grassy River Faults on the eastern extremity of the Wedge area.

The 'Possible' resource tonnage has been reduced from 950,000 to 345,000 tonnes.

The B lens ore resource has been decreased from 667,000 tonnes at 0.77% WO_3 to 463,000 tonnes at 0.83% WO_3 due to oreblocking diamond drilling since the last calculation in 1975. The resource remains classified as 'Probable'.

B lens resource defined above the -50 m. R.L. amounts to 127,000 tonnes at 0.68% WO_3 .

DIAMOND DRILLING 1978-79

The underground oreblocking program has continued and a total of 174 holes for 15,077 m have been completed since oreblocking commenced in December, 1973.

The K.I.S. M5 machine has been used in 7 holes totalling 171 m to provide additional structural and ore outline definition. This machine is not employed in the oreblocking program.

Diamond drilling for the current year is outlined below. Drill sites have been planned from the S9 and S10 drives in preference to the -150 m. R.L. drill drive. This will result in shorter holes, better definition and information is received at an earlier date.

Scheduled program for 1978-79

	Budget (metres)	Drilled to 29-8-78	Meterage to be drilled 1978-79	Over budget
<u>C lens</u>	2,655	484.1	2,770	+599
<u>B lens</u>	570	121.0	385	- 64
<u>C lens east of Section 360 E</u>	350	54.0	200	- 96
<u>Skew Drilling</u>	250	49.5	200	
<u>Surface (Open Cut)</u>	840	4.0	836	
<u>Structural Drilling</u>			390	+390
<u>Total</u>	<u>4,665</u>	<u>712.6</u>	<u>4,781</u>	<u>+829</u>

The open cut drilling could be suspended from this year's program in lieu of the planned overrun.

B lens oreblocking along sections at 20 m intervals will continue as sites become available.

C lens oreblocking should fully define the bottom of the mine this year as well as test the area east of the Decline and ?Grassy River Faults.

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ENGINEERING GEOLOGY

Engineering geology studies continue to be directed towards diamond drilling and mine openings.

All diamond drill core obtained in the oreblocking program is logged for its engineering parameters and information is recorded in the drill logs and on Engineering Geology sections.

In mine openings all pillars continue to be photographed and geologically mapped in detail. Records are maintained by the Rock Mechanics Engineer.

Comments made under Engineering Geology (Danielson, 1976) remain applicable.

COMPUTER

All diamond drilling and grab sample assay data are forwarded to the computer group in Sydney on a regular basis.

The computer is now producing block grade estimates at three levels of prediction.

- a. Historic data for the lift just completed.
- b. Final prediction for the lift immediately above the working level.
- c. Preliminary prediction for the lift immediately above that.

Computer block grade predictions in the Wedge and Central areas are approaching an acceptable level of accuracy but appears to be slightly underestimating grades in the Pit area. In both the Central and Pit areas, block grade predictions are limited by the small number of grab sample assays available.

The computer group is now moving to produce an overall Dolphin ore resource tonnage and grade estimate. Initially the resource will be calculated above the -150 m. R.L. and then extended to below the -150 m. R.L.

The computer group has also estimated the molybdenum resource grades above the -150 m. R.L. divided into Wedge Upper (0.046% Mo), Wedge Lower (0.031% Mo), Central (0.025% Mo) and Pit (0.027% Mo). There are no manually calculated grades for comparison.

The computer grade predictions are now being routinely used for mine planning purposes.

A comparison of the manual resource grade, manual mining reserve and computer reserve grade is tabulated below with weighted average differences in grade according to tonnes mined.

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	<u>Actual</u>	<u>Manual Resource</u>	<u>Manual Reserve</u>	<u>Computer Reserve</u>	<u>% Adj M.Res/Act</u>	<u>% Adj M.Rsv/Act</u>	<u>% Adj Comp/Act</u>
<u>Wedge Area</u>							
<u>Upper C lens</u>							
Undercut	1.20	1.36	1.22	1.07	+13	+ 2	-11
lift 1	1.01	1.28	1.15	1.03	+27	+14	+ 2
lift 2	1.07	1.28	1.15	1.04	+19	+ 7	- 3
lift 3	1.01	1.28	1.15	1.10	+21	+14	+ 9
lift 4	1.12	1.28	1.15	1.29	+14	+ 3	+15
lift 5	0.94	1.28	1.15	1.18	+36	+22	+26
lift 6	1.14	1.28	1.15	1.19	+12	+ 1	+ 3
lift 7	1.04	1.28	1.15	1.15	+23	+11	+11
Wt. Average	<u>1.08</u>	<u>1.30</u>	<u>1.17</u>	<u>1.12</u>	<u>+20</u>	<u>+ 8</u>	<u>+ 4</u>
<u>Lower C lens</u>							
Undercut	0.69	0.72	0.65	0.71	+ 4	- 6	+ 3
lift 1	0.61	0.70	0.63	0.61	+14	+ 3	+ 0
lift 2	0.68	0.70	0.63	0.44	+ 3	- 7	-35
lift 3	0.67	0.70	0.63	0.47	+ 4	- 6	-30
lift 4	0.69	0.70	0.63	0.47	+ 1	- 9	-32
lift 5	0.93	0.70	0.63	0.41	-25	-32	-56
lift 6	0.78	0.70	0.63	0.89	-10	-19	+14
lift 7	0.73	0.70	0.63	0.82	- 4	-14	+12
Wt. Average	<u>0.72</u>	<u>0.70</u>	<u>0.63</u>	<u>0.61</u>	<u>- 3</u>	<u>-13</u>	<u>-15</u>
<u>Central Area</u>							
<u>Upper and Lower C</u>							
Undercut	0.84	1.00	0.90	-	+19	+12	
lift 1	0.99	1.00	0.90	-	+ 1	-10	
lift 2	0.92	1.00	0.90	-	+ 2	- 2	
lift 3	0.82	1.00	0.90	0.80	+22	+10	- 2
lift 4	0.82	1.00	0.90	0.81	+22	+10	- 1
lift 5	0.76	1.00	0.90	0.84	+32	+18	+11
Wt. Average	<u>0.80</u>	<u>1.00</u>	<u>0.90</u>	<u>0.82</u>	<u>+25</u>	<u>+13</u>	<u>+ 3</u>
<u>Pit Area</u>							
<u>Upper C lens</u>							
Benching/ Undercut 1st & 2nd lift							
	1.08	1.00	0.90	-	- 7	-17	
3rd lift	0.84	1.00	0.90	0.91	+19	+ 7	+ 8
4th lift	0.85	1.00	0.90	0.86	+18	+ 6	+ 1
Wt. Average	<u>0.84</u>	<u>1.00</u>	<u>0.90</u>	<u>0.89</u>	<u>+19</u>	<u>+ 7</u>	<u>+ 6</u>
<u>Summary</u>	<u>0.89</u>	<u>1.02</u>	<u>0.92</u>	<u>0.88</u>	<u>+15</u>	<u>+ 3</u>	<u>- 1</u>

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FUTURE OREBLOCKING PROGRAMS

On completion of drilling planned for the current year, very little oreblocking drilling will be required for the future. Structural and C lens definition will have been completed as well as skew drilling to the east of the Decline Fault and ?Grassy River Faults.

B lens oreblocking at 20 m intervals will continue as the mine develops and drill sites become available. Continuation of the program to 220360 E will require approximately 1,500 m.

Open cut diamond drilling will continue in 1979-80 if that drilling is suspended from this years program in lieu of the planned overrun in meterage.

164027

REFERENCES

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- Danielson M.J., October, 1975. Geological Review - Dolphin Orebody, October 1975.
- Danielson M.J., 1976 King Island Scheelite Deposits in Economic Geology of Australia and Papua New Guinea Vol. 1. pp 592 - 597.
- Danielson M.J., October, 1976. Geological Review - Dolphin Orebody, October, 1976.
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MINE PRODUCTION SUMMARYB LENS13,312 t @ 0.43% WO₃ 13,312 0.43C LENS PIT

Portal & main decline access	5,473 t @ 0.64% WO ₃	
- 67m to - 77m R.L.	40,530 t @ 0.52% WO ₃	
-110m to -120m R.L. (J16)	3,490 t @ 0.59% WO ₃	
Stoping Area (-134m to -158m R.L.)	139,636 t @ 0.92% WO ₃	
		<u>189,129 0.82</u>

C LENS CENTRAL

- 66m to - 79m R.L.	25,960 t @ 1.62% WO ₃	
-130m to -145m (N15)	10,573 t @ 0.76% WO ₃	
-125m to -152m R.L.	118,534 t @ 0.85% WO ₃	
		<u>155,067 0.97</u>

C LENS WEDGE

above -77m R.L.	65,277 t @ 1.04% WO ₃	
-100m R.L. (Q13)	2,770 t @ 0.55% WO ₃	
-130m undercut & main decline	73,414 t @ 0.98% WO ₃	
1st lift	44,177 t @ 0.86% WO ₃	
2nd lift	33,304 t @ 0.89% WO ₃	
3rd lift	34,004 t @ 0.85% WO ₃	
4th lift	36,359 t @ 0.95% WO ₃	
5th lift	34,464 t @ 0.94% WO ₃	
6th lift	28,288 t @ 0.97% WO ₃	
7th lift	30,727 t @ 0.87% WO ₃	
8th lift	19,456 t @ 0.87% WO ₃	
-150m R.L. Development	17,639 t @ 1.01% WO ₃	
-200m R.L. Development	4,387 t @ 0.99% WO ₃	
Below -200m R.L.	5,713 t @ 0.84% WO ₃	
		<u>429,979 0.94</u>

Total Mine Production
(to 29-8-78)

787,487 t @ 0.91% WO₃

SUMMARY FOR DIAMOND DRILLING RESULTS

FOR HOLES COMPLETED SINCE OCTOBER 1977

<u>DRILLING SECTION</u>	<u>HOLE No.</u>	<u>BEARING</u>	<u>INCLINATION</u>	<u>TOTAL DEPTH</u>	<u>MINERALIZATION</u>		<u>REMARKS</u>
220 120	D120/19	360	0	41.3	Min. Pgh	38- 41m, 3m @ 0.52% WO ₃	
220 140	D140/4	0	-28	114.5	Upper C lens	18- 39m, 21m @ 1.18% WO ₃	
	D140/5	0	-73.5	49m	Min. Pgh	4- 7m, 3m @ 1.96% WO ₃	
					Upper C lens	19- 23m, 4m @ 0.76% WO ₃	
	D140/6	0	- 9	119.6	Min. Pgh	0- 3m, 3m @ 5.03% WO ₃	
					Upper C lens	67- 82m, 15m @ 1.74% WO ₃	
					Lower C lens	99-115m, 16m @ 0.70% WO ₃	
	D140/7	0	-51	60.0	Min. Pgh	1- 5m, 4m @ 3.49% WO ₃	
					Upper C lens	17- 31m, 14m @ 1.18% WO ₃	
220 160	D160/12	360	-90	106.6	Min. Pgh	27- 39m, 12m @ 0.89% WO ₃	
	D160/13	360	-60	68.7	Upper C lens	24- 31m, 7m @ 0.88% WO ₃	
					Lower C lens	48- 54m, 6m @ 0.66% WO ₃	
	D160/14	360	-35	90.4	Upper C lens	28- 42m, 14m @ 1.28% WO ₃	
					Lower C lens	47- 59m, 12m @ 0.94% WO ₃	
	D160/15	360	0	70.8	B lens	26- 28m, 2m @ 0.54% WO ₃	
	D160/16	360	-21	72.2	Upper C lens	33- 53m, 20m @ 1.64% WO ₃	
					Lower C lens	59- 66m, 7m @ 0.65% WO ₃	
	D160/17	180	-75	128.1	Upper C lens	31- 41m, 10m @ 0.95% WO ₃	In granite
					Upper C lens	97-102m, 5m @ 0.78% WO ₃	
	D160/18	180	-63	131.5	B lens	58- 61m, 3m @ 0.79% WO ₃	In granite
						63- 65m, 2m @ 0.54% WO ₃	
						68- 71m, 3m @ 0.65% WO ₃	
					C lens	107-113m, 6m @ 0.55% WO ₃	
	D160/19	180	-49	109.7	B lens	32- 34m, 2m @ 4.24% WO ₃	Abandoned

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DRILLING SECTION	HOLE No.	BEARING	INCLINATION	TOTAL DEPTH		MINERALIZATION	REMARKS
220 180	D180/7	180	+55	46.5	B lens	22- 28m, 6m @ 0.42% WO ₃ 35- 37m, 2m @ 0.33% WO ₃	
	D180/6	180	+30	74.5	B lens	27- 38m, 11m @ 0.88% WO ₃ 40- 44m, 4m @ 0.39% WO ₃	
220 200	D200/17	360	-62	82.8	Upper C lens Lower C lens	34- 47m, 13m @ 0.86% WO ₃ 52- 70m, 18m @ 0.59% WO ₃	
	D200/18	360	-80	93.0	Upper C lens Lower C lens	33- 45m, 12m @ 0.95% WO ₃ 57- 74m, 17m @ 0.41% WO ₃	
	D200/19	180	-81	95.5	Upper C lens Lower C lens	41- 60m, 19m @ 1.10% WO ₃ 61- 79m, 18m @ 0.58% WO ₃	
	D200/20	180	-66	135.0	Upper C lens Upper C lens	48- 73m, 25m @ 2.14% WO ₃ 99-123m, 24m @ 1.22% WO ₃	Swan Fault 75.0-75.6m
	D200/21	180	-54	160			In granite No significant mineralization.
	D200/22	180	+58	48.7	B lens	12- 20m, 8m @ 4.33% WO ₃	
	D200/23	180	+14	91.6	Upper C lens	0.0-8.0m, 8m @ 1.13% WO ₃	
	D200/24	0	-26	53.5			No significant mineralization
	D200/25	180	+19	72.2	Min. Pgh B lens B lens	6- 13m, 7m @ 7.22% WO ₃ 25- 27m, 2m @ 0.35% WO ₃ 46- 67m, 17m @ 1.41% WO ₃	
220 220	D220/10	0	0	25.9	Awaiting Assays		Northern Boundary Fault 25.0m
	D220/11	-	-90	20.7	Awaiting Assays		
220 240	D240/11	360	-83	128.3	Upper C lens Lower C lens	45- 67m, 22m @ 1.3% WO ₃ 71- 83m, 12m @ 0.85% WO ₃	Granite Basement

164030

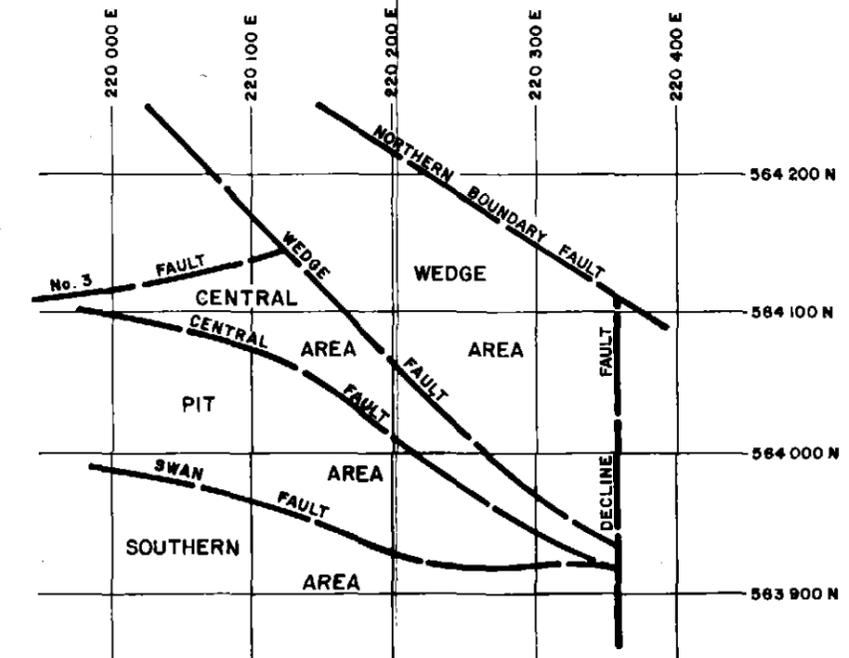
<u>DRILLING SECTION</u>	<u>HOLE No.</u>	<u>BEARING</u>	<u>INCLINATION</u>	<u>TOTAL DEPTH</u>	<u>MINERALIZATION</u>		<u>REMARKS</u>
220 240	D240/12	180	-77	136.0	Upper C lens	67- 76m, 9m @ 0.83% WO ₃	Swan Fault 87-88m In Granite
					Lower C lens	81- 87m, 6m @ 0.84% WO ₃	
					Upper C lens	97-108m, 11m @ 1.89% WO ₃	
					Lower C lens	110-113m, 3m @ 0.58% WO ₃	
	D240/13	180	-62	157.7	B lens	3- 7m, 4m @ 0.74% WO ₃	
					B lens	37- 47m, 10m @ 0.86% WO ₃	
					Upper C lens	126-137m, 11m @ 1.39% WO ₃	
	D240/14	180	-54	178.6	B lens	3- 6m, 3m @ 1.23% WO ₃	Granite Basement
					Upper C lens	155-165m, 10m @ 1.13% WO ₃	
	D240/15	360	-72	80.9	Upper C lens	83-100m, 17m @ 1.49% WO ₃	Granite Basement
				EXT 125.1	Lower C lens	102-104m, 2m @ 0.52% WO ₃	
	D240/16	0	-74	85.0			No significant mineralization
	D240/17	0	-40	76.0	Lower C lens	49- 62m, 13m @ 0.67% WO ₃	
220 260	D260/1	-	-90	139.5	Upper C lens	92-107m, 15m @ 0.94% WO ₃	Granite Basement
					Lower C lens	111-114m, 3m @ 0.35% WO ₃	
	D260/2	0	-71	98.0			No significant mineralization
220 280	D280/7	360	-90	141.2	Min. Pgh	66- 75m, 9m @ 1.38% WO ₃	No C lens horizon intersected
	D280/8	360	-70	103.4	Lower C lens	74- 85m, 11m @ 0.87% WO ₃	
	D280/9	360	-50	102.5	Lower C lens	52- 54m, 2m @ 1.83% WO ₃	
					Lower C lens	60- 62m, 2m @ 2.17% WO ₃	
					Lower C lens	64- 91m, 27m @ 0.77% WO ₃	
	D280/10	360	-26	90.0	Upper C lens	55- 77m, 22m @ 1.36% WO ₃	
					Lower C lens	79- 81m, 2m @ 0.90% WO ₃	
	D280/11	180	-76	144.5	Min. Pgh	135-136m, 1m @ 0.47% WO ₃	Granite Basement

<u>DRILLING SECTION</u>	<u>HOLE No.</u>	<u>BEARING</u>	<u>INCLINATION</u>	<u>TOTAL DEPTH</u>	<u>MINERALIZATION</u>		<u>REMARKS</u>
220 280	D280/12	180	-64	190.0	B lens	76- 78m, 2m @ 1.10% WO ₃	Granite
					C lens	160-170m, 10m @ 0.89% WO ₃	Basement
	D280/13	180	-54	200.0	C lens	179-183m, 4m @ 1.14% WO ₃	Granite Basement
	D280/14	090	0				Decline Fault 19.0-25.0m
	D280/14A	090	0	80.6			Decline Fault 20-25.0m
220 320	D320/4	180	-77	119.3	Upper C lens	43- 65m, 22m @ 2.04% WO ₃	
					Lower C lens	65- 85m, 20m @ 1.48% WO ₃	
	D320/5	180	-58	127.1	Min. Pgh	44- 48m, 4m @ 0.65% WO ₃	
					Upper C lens	58- 84m, 26m @ 2.08% WO ₃	
					Min. m/m	89- 92m, 3m @ 0.64% WO ₃	
					Lower C lens	98-109m, 11m @ 0.59% WO ₃	
	D320/6	180	+13	82.3	Min. m/m	26- 33m, 7m @ 0.55% WO ₃	Swan Fault
					Upper C lens	33- 46m, 13m @ 1.68% WO ₃	55.0-59.2m
	D320/7	-	90	46.3	Lower C lens	0- 13m, 13m @ 0.46% WO ₃	Granite Basement
	D320/8	180	-38	100.5	Awaiting Assays		
220 330	D330/1	112	- 2	55.0			Decline Fault Zone 43-45m
220 340	D340/1	0	-70	90.5	Min. Pgh	15- 27m, 12m @ 1.44% WO ₃	Decline Fault
					C lens	27- 36m, 9m @ 0.62% WO ₃	Zone 10-13m Granite Basement
	D340/2	0	-44	67.5	C lens	33- 45m, 12m @ 1.06% WO ₃	Northern Boundary Fault 63.5-64.1m
	D340/3	090	-10	42.0			In progress
220 360	D36/1	-	-90	70.5	B lens	0- 15m, 15m @ 0.61% WO ₃	Decline Fault
					B lens	17- 26m, 7m @ 0.92% WO ₃	Zone 42-70.5m Incomplete
	D360/2	270	-63	91.0	Min. Pgh	29- 35m, 6m @ 1.06% WO ₃	Granite
					Upper C lens	35- 37m, 2m @ 1.46% WO ₃	Basement
					m/m & Lower C	37- 55m, 18m @ 3.02% WO ₃	
					Min. Bfb	59- 62m, 3m @ 0.56% WO ₃	
164032	D360/3	090	-70	54.0	B lens	9- 19m, 10m @ 0.67% WO	Decline Fault Zone 37-42m In Progress

'C' LENS ORE RESOURCE

	WEDGE		CENTRAL		PIT		SOUTHERN		TOTAL		CUMULATIVE TOTAL	
	15,700	1.10	15,800	1.65	7,000	2.10	—	—	38,500	1.50	38,500	1.50
	—	—	—	—	237,000	0.65	—	—	237,000	0.65	237,000	0.65
	—	—	—	—	—	—	—	—	—	—	—	—
-75mR.L.	244,000	1.19	65,000	1.48	6,000	0.71	—	—	315,000	1.24	353,500	1.27
	—	—	—	—	105,000	0.62	—	—	105,000	0.62	342,000	0.64
	—	—	—	—	—	—	—	—	—	—	—	—
-100mR.L.	13,000	1.09	245,000	1.19	48,000	0.74	—	—	306,000	1.12	659,500	1.20
	—	—	—	—	30,000	0.59	—	—	30,000	0.59	372,000	0.64
	—	—	—	—	—	—	—	—	—	—	—	—
-125mR.L.	498,000	1.04	22,000	1.59	26,000	0.70	—	—	546,000	1.05	1,205,500	1.13
	—	—	—	—	—	—	—	—	—	—	372,000	0.64
	—	—	—	—	—	—	—	—	—	—	—	—
-150mR.L.	1,056,000	1.20	158,000	1.38	617,000	1.05	—	—	1,831,000	1.16	3,036,500	1.15
	—	—	—	—	44,000	1.05	—	—	44,000	1.05	416,000	0.68
	—	—	—	—	—	—	100,000	—	100,000	—	100,000	—
-200mR.L.	632,000	1.33	25,000	1.25	295,000	0.81	270,000	1.08	1,222,000	1.15	4,258,500	1.15
	315,000	1.37	—	—	—	—	23,000	0.94	338,000	1.34	754,000	0.98
	200,000	—	25,000	—	—	—	20,000	—	245,000	—	345,000	—
TOTALS:	2,458,700	1.20	530,800	1.32	999,000	0.96	270,000	1.08	PROVEN:		4,258,500	1.15
	315,000	1.37	—	—	416,000	0.68	23,000	0.94	PROBABLE:		754,000	0.98
	200,000	—	25,000	—	—	—	120,000	—	POSSIBLE:		345,000	—

PEKO - WALLSEND OPERATIONS LIMITED
GEOPEKO DIVISION, KING ISLAND
ORE RESOURCE TABLE DOLPHIN OREBODY
29-8-78



DOLPHIN OREBODY SUMMARY

Proven Ore Resource:

C Lens 4,258,500 Tonnes at 1.15 % WO₃

Probable Ore Resource:

C Lens 754,000 Tonnes at 0.98 % WO₃

B Lens 463,000 Tonnes at 0.83 % WO₃

Possible Ore Resource:

C Lens 345,000 Tonnes

Ore Resource Locked in Pillars:

Post Pillars (unrecoverable) 199,000 Tonnes

Sill Pillars 130,000 Tonnes

Rib Pillars 36,450 Tonnes

Regional Pillars 87,000 Tonnes

Total Proven and Probable Ore Resource: 5,475,500 Tonnes at 1.10 % WO₃

'B' LENS ORE RESOURCE
(PROBABLE RESOURCE)

-50mR.L.	113,000	0.63	14,000	1.06	—	—	—	—	127,000	0.68	127,000	0.68
	217,000	*0.84	102,000	0.96	9,000	0.94	8,000	0.86	336,000	0.88	463,000	0.83

* 74,000 at 0.97% East of Decline Fault

METHOD OF GRADE CALCULATION:

Modified polygonal method of weighted arithmetic means.

METHOD OF TONNES CALCULATION:

Truncated cone formula, using geological floor plans in the Wedge Area and all other areas below the -150mR.L. Drill sections used above -150mR.L.

ISG REFER REPORT 70-0676

164033

Compiled by: G.J.B.
Drawn by: R.F.
Checked by: M.C.R.
Date: 29 AUG 78