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TCR 81-1541

GEOPEKO

KING ISLAND

Report No. KI/81/1

AN INTERIM PROGRESS REPORT

ON EXPLORATION LICENCE 21/78

by

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OPEN FILE

KING ISLAND FEBRUARY 1981

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INTRODUCTION

Exploration Licence 21/78, granted in January 1980, is held by Warman Services Limited and covers an area of 37 square kilometers offshore of south east King Island. This Licence is contiguous with EL 15/66 and covers the offshore portion of the Grassy Granite Contact Zone.

The onshore portion of the Grassy Granite contact has been extensively tested by geological mapping, geophysics, geochemistry and auger, percussion and diamond drilling.

Although suitable host rocks (Mine Series) were located over a large proportion of the contact zone, to date only six areas of minor scheelite mineralisation have been located outside of the Dolphin/No.1 orebody area.

A similar situation exists at Bold Head where the contact zone of the Bold Head Adamellite and the adjacent Mines Series rocks have been found to contain only minor mineralisation, outside of the fault block containing the Bold Head Orebody.

Although it is not possible to distinguish Mine Series rocks by their magnetic character it is a fact that at both the Bold Head and Grassy Granite contact areas the mine series rocks are overlain by volcanic rocks which do produce magnetic anomalies.

Both the Bold Head orebody and the Dolphin/No.1 orebody exist in Mine Series rocks overlain by volcanics adjacent to the contacts of a Devonian/ Carboniferous Granite body and in close proximity to the major fault zone, the Grassy River Fault.

Interpretation of the 1973 Aeromagnetic Survey data suggested that a similar configuration could occur where the Southern Grassy Granite Contact abutted the Grassy River Fault Zone.

The detail available from the 1973 survey was considered insufficient to allow a reasonable assessment of the nature and location of the structures and possible geology/geometry of the area to be made. Since the depth of water precluded the use of normal techniques, such as geological mapping or geochemistry, to provide targets for diamond or percussion drilling the decision was made to carry out an accurately positioned, detailed low level aeromagnetic survey.

To date work carried out on the area consists of:

- Reassessment of the 1973 aeromagnetic survey results.
- Examination and interpretation of results obtained from diamond drilling carried out in the eastern portion of Dolphin Mine.
- Preparation for and execution of a low level airborne magnetic and radiometric survey.
- Examination of the analogue records of the radiometrics.
- Reduction of the aeromagnetic results of the above survey and production of a 1.25000 computer produced contour plot.

Neither recommendations nor conclusions are given in this report as assessment and interpretation of the results of the airborne survey are still being carried out.

SUMMARY

The work to date can be divided into two phases:

Phase 1: The first six months to July 1980 which consisted of

- Re-examination and reassessment of the 1973 airborne magnetic and radiometric surveys which showed that, although the southern contact of the Grassy Granite was probably a granite/volcanic contact, there was insufficient resolution for the position to be accurately fixed.
- Examination and interpretation of the results from exploration diamond drilling carried out in Dolphin Mine. This together with the reassessment of the 1973 magnetics, suggested that the major fault inferred in this area was 400m further east than previously interpreted.
- Preparation of land survey stations for an aeromagnetic survey carried out in Phase 2.

Phase 2: From July 1980 to the present consisting of

- Execution of a detailed low level aeromagnetic and radiometric survey of about 1800 line kilometers carried out in July/August 1980.
- Reduction of the results of the aeromagnetic survey and preparation of a 1.25000 scale computer produced contour plan.
- Commencement of one deep diamond drill hole to test the structure and stratigraphy of the area east of the current Dolphin Mine workings.

Phase 2 is currently in progress with the results of the aeromagnetic survey being correlated with the known onshore geology and interpretation of the offshore magnetics being carried out based on this correlation.

The new aeromagnetic survey has allowed production of a much more detailed contour map of the area which has shown a number of significant differences from the less well controlled 1973 survey.

WORK TO DATE

PHASE 1

Reassessment of the 1973 aeromagnetic survey confirmed the initial interpretation that there was a high probability that the majority of the southern Grassy Granite contact consisted of volcanics in contact with, or in close proximity to, granite.

It was felt that it was geologically possible for mine series rocks to be present under these volcanics and in proximity to the granite contact. These rocks, where present round the northern and western contact, dip in towards the Grassy Granite and it was felt there was a possibility that these rocks could similarly dip into the granite on the southern side.

Five basic possible geological models were envisaged for the southern contact area, these are:

a. Granite in contact with volcanics directly overlying quartzites. This model has no mine series rocks present to act as host rocks for possible mineralisation and is considered to have a low economic potential.

b. Granite in contact with a volcanic/mines series/quartzite sequence dipping into the granite contact with the volcanics being relatively thin (<500m).

c. Granite in contact with a volcanic/mine series/quartzite sequence dipping away from the granite contact with the mine series rocks exposed on the sea bed between the granite and the volcanics.

d. Granite in contact with a volcanics/mine series/quartzite sequence dipping into the granite contact with the volcanics being relatively thick (>1500m).

e. Granite in contact with a volcanic/mine series/quartzite sequence dipping away from the granite with the mine series rocks not exposed but covered by volcanics.

Obviously there is considerable room for variations between these basic models.

The 1973 aeromagnetic survey was flown at a height of 100m on a 200m line spacing using only conventional photographic methods to fix position. This meant that actual flight line positions over the sea could be grossly inaccurate and therefore the interpreted granite contact position.

In addition, because of the relative lack of detail in the offshore aeromagnetic data it was felt that there was too much uncertainty to allow any of the postulated models to be regarded as the most likely and thus to be used to plan further testing of the Southern Contact area.

Work being carried out in the Dolphin Mine area adjacent to the western boundary of EL 21/78 showed that the mineralisation was truncated at about 220380 E (I.S.G.) by a major north west - south east trending fault termed the Grassy River Fault.

Adjacent to this fault zone the Grassy Granite contact strikes south and dips east, suggesting a drag down on the fault which down throws to the east. Re-examination of the 1973 magnetics showed that this fault was, whilst in line with the major fault forming the western limit of the Bold Head Adamellite, not reflected in the aeromagnetics. These showed the major charge in magnetic character to be almost 400m further east.

It appeared that the major fault running south from the Bold Head area is offset to the east, in its southern portion, by a fault trending almost east-west and located 1km north of the mouth of the Grassy River.

The continuation of similar magnetic response out to the eastern fault position suggested that the down thrown block could consist of a volcanics/mine series/granite sequence similar to that in the Dolphin Mine, and thus constituted a potential ore zone (currently termed Dolphin East area).

Since the 1973 aeromagnetics were deficient both in detail and in accuracy of positioning, and since the area over which we required more data was so large, it was decided to replace the initially planned seaborne magnetic survey with a detailed, precisely controlled, low level airborne survey. This survey could be conducted over both the Bold Head and Grassy Granite contacts and the surrounding area, and would allow correlation between the magnetic response of the onshore rocks and the known geology to be used to aid the interpretation of the offshore magnetics.

The initial step in the execution of the airborne survey entailed the re-establishment of two survey stations, Russel and Hellerman to be used as base stations for the range-range equipment fitted to the survey aircraft. This work was carried out in June 1980.

WORK TO DATE

PHASE 2

A detailed low level aeromagnetic survey was conducted by Austirex International Pty Ltd on behalf of Geopeko over EL 21/79 and portions of EL 15/66 in July/August 1980. 78

The survey was conducted on east-west lines spaced 150m apart, with north-south tie lines 1500m apart. Mean terrain clearance was 50m onshore and 15m offshore. Navigation and flight path recovery were achieved using VHF range-range radio equipment supplemented by conventional photographic techniques. About 1800 line kilometres of data were collected.

The Austirex Nomad N22B aircraft was equipped with a modified Varian V85 magnetometer, a Geometrics GR800D multichannel gamma ray spectrometer. 50 l of 4 π geometry NaI (Tl) scintillation crystal, 15 l of 2 π geometry upward looking crystal, a Sonotek digital data acquisition system and navigation equipment.

Inspection of analogue records showed no significant spectrometer anomalies and no further processing of this data is contemplated.

Preliminary contours of residual total magnetic intensity have been produced on 1.25000 scale. This plan has confirmed the overall magnetic picture of the area with increased detail and a number of significant variations in some areas.

Points arising from the preliminary examination of the contour plan are:

- The major change in magnetic character of the rocks in the Dolphin area has been confirmed to occur about 400m east of the current workings. This suggests that the initial interpretation of a down faulted block of volcanics/mines series and granite existing in the Dolphin East area is still valid, hence this area continues to have economic potential.
- The inferred east-west fault ('A' on plan) which offsets the major north west - south east fault between Bold Head and Dolphin areas is located about 1 kilometer further south than indicated by the 1973 survey. This puts the offset at about the mouth of the Grassy River and precludes the possibility of testing the Dolphin East fault block with a drill hole from surface.
- The additional detail available has shown that the anomaly ('B' on contour plan) located under Grassy Bay is an intense high, rather than the broad anomaly shown on the earlier survey. It is thus probable that this high reflects magnetic character in volcanics rather than a granite intrusion as was previously thought possible.
- The general north east - south west trend in the magnetics south east of Bold Head is parallel to bedding within the volcanics, as mapped at Bold Head Point, and probably reflects the varying magnetic character of different horizons within the volcanics.
- The complex linear system south and west of the Dolphin is still considered to reflect the presence of volcanic rocks. There is however a possibility that the granite contact could be located some distance north west of the main linear trend as volcanics with low magnetic susceptibility could be present adjacent to the granite contact.

The foregoing is only a preliminary assessment of the results and correlation of the known onshore geology with the magnetics, is in progress. Considerable amounts of work still require to be done.

Diamond drill hole D 360/12 drilled from the -240m RL S10 drive (563969.4N 362.2 R 090°/-60°) has progressed 337m. Considerable difficulty has been encountered in this hole due to the heavily faulted nature of the ground.

This hole was initially commenced to test the depth to granite in the Dolphin East area and thus to test the hypothesis that some movement on the Grassy River Fault postdated the granite intrusion even though the original zone of weakness predated it.

While this drill hole has shown that the Grassy Granite is almost certainly cut by the Grassy River Fault the throw on this fault has been much greater than anticipated. (300m)

Results to date have not precluded the presence of mine series or granite in this zone and diamond drilling is continuing to define the stratigraphy and structure.

FUTURE WORK PROGRAMME

During the next six months the following work programme is planned:

1. Completion of diamond drill hole D 360/12, currently planned to a drilled depth of at least 400m.

   The F30 drill rig has been overhauled and this machine is thought to now have the capacity to drill 500m using AQ rods, dependent on the nature of the ground. This would allow extension of this hole to the -660m RL.

2. Interpretation of the results of the airborne magnetic survey using the known onshore geology and its relationship to the magnetic results.

3. The drilling of one further hole in Dolphin East area to further define the structure and stratigraphy of this area. This hole would be drilled at a dip of approximately -85° and is currently planned to be drilled to a depth of 300m.

4. Dependent on the results of 2. above, subsequent followup work will be required in areas of interest. This work may include diamond drilling should favourable results be obtained.

EXPENDITURE ON EL 21/78

Phase 1	Preparation for aerial survey and reassessment of the 1973 survey date	$ 1 275.03
Phase 2	Execution of airborne survey 50% of the costs of the airborne survey have been allocated to EL 15/66 leaving costs allocated to EL 21/78 as	$ 13 495.00
	Costs of data processing and preparation of T.M.I. contours are not yet to hand. Estimated at	$ 8 000.00
	Diamond drill hole D 360/12 costs to end of December	$ 36 697.50
	Total expenditure on EL 21/78 to date	$ 59.467.53

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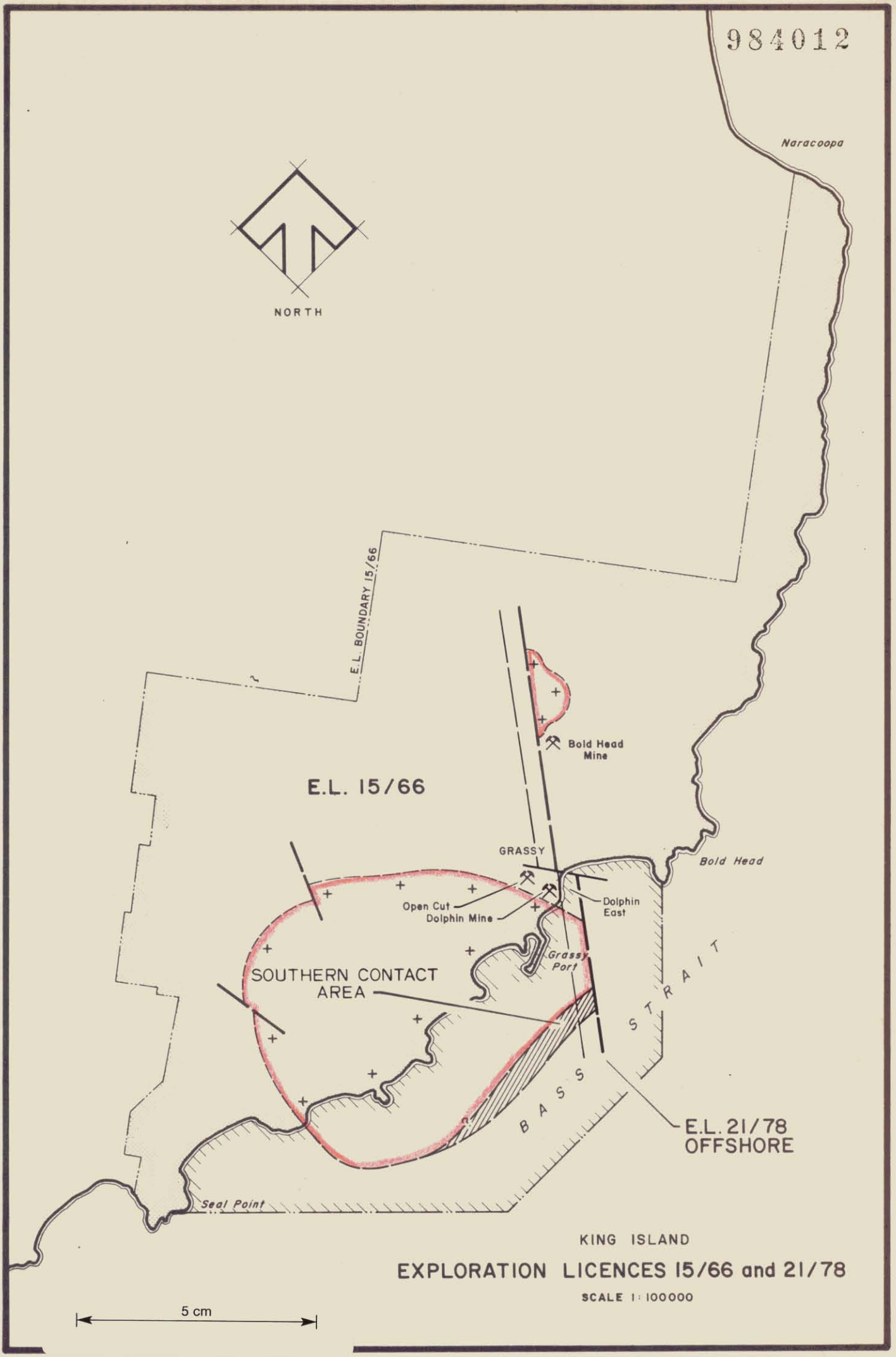
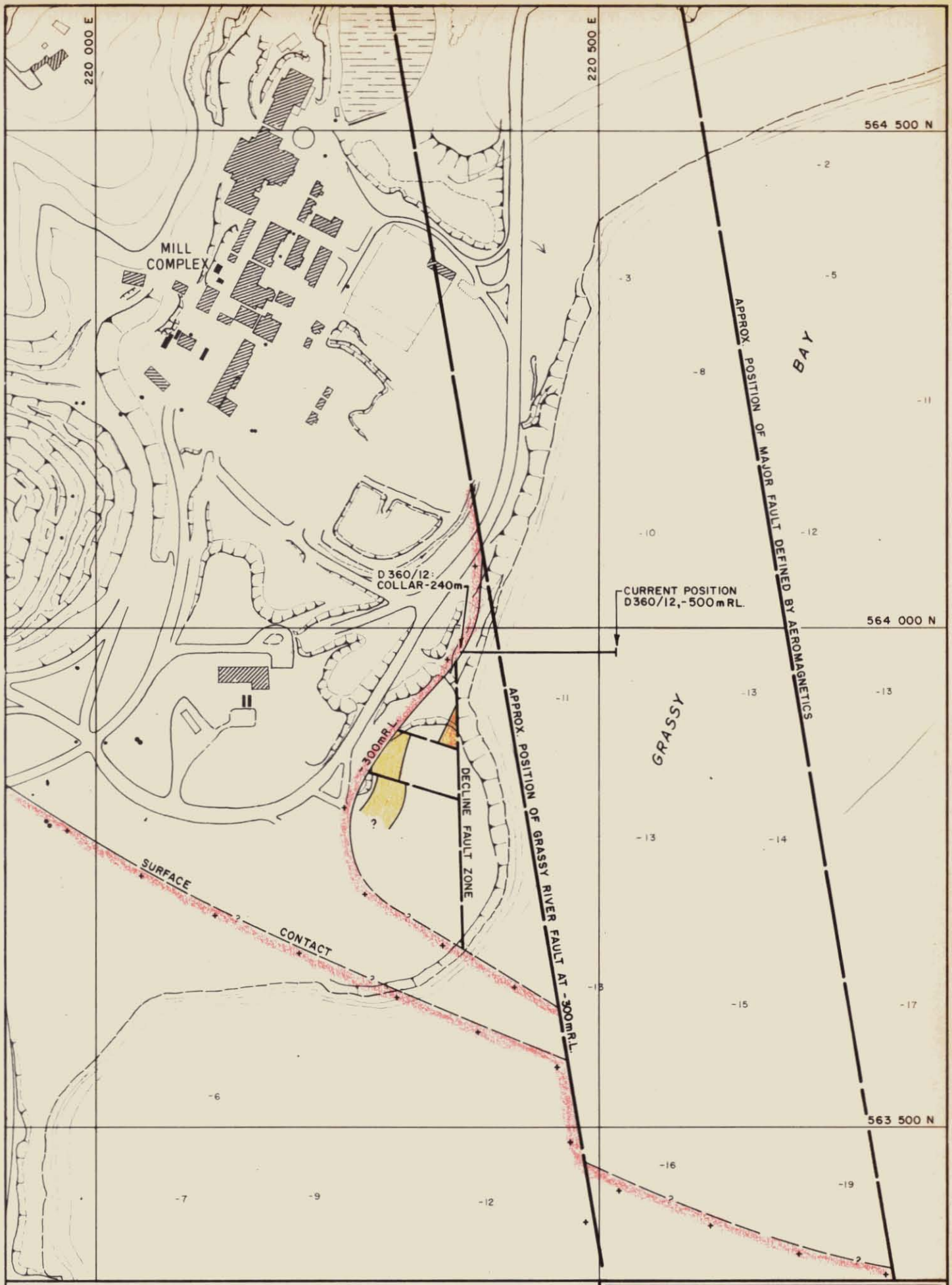


KING ISLAND

EXPLORATION LICENCES 15/66 and 21/78

SCALE 1:100000

REF. PLAN					
	GEOLOGY	S.G.B.	8-12-80	1 : 1000 SCALE	KING ISLAND SCHEELITE GRASSY KING ISLAND
	SURVEY				
	PLANNING			3 DOLPHIN MINE	
	ROCK. MEC.			564 975N L/SECT.	
	GRADE CON.			SHOWING DDH 360/12	
5 cm	DRAFTING				
	T.S.S.			DRAWING NUMBER	



LEGEND:

- C Lens horizons at -300m R.L.
- Granite contact
- Fault

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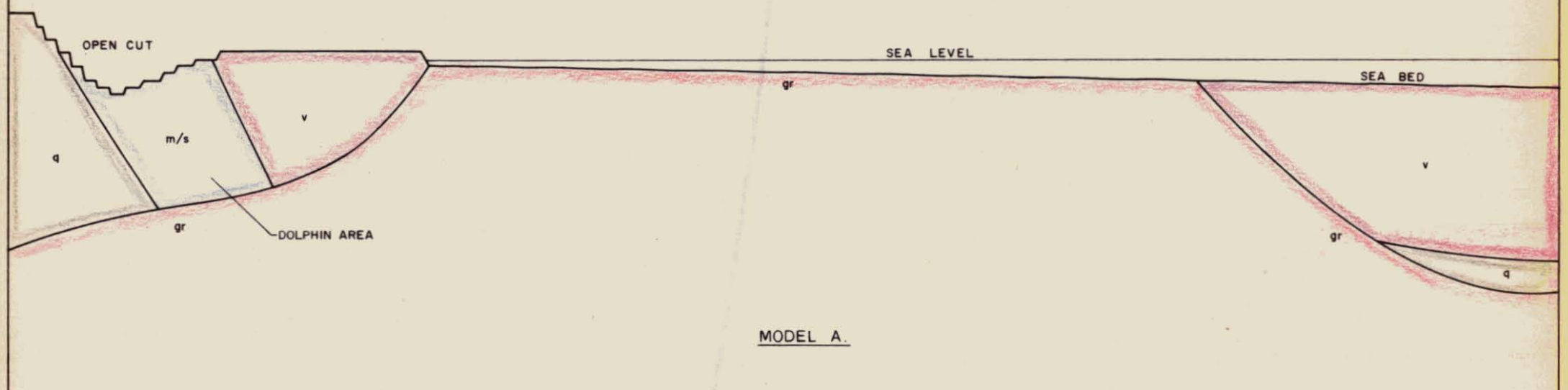
5 cm

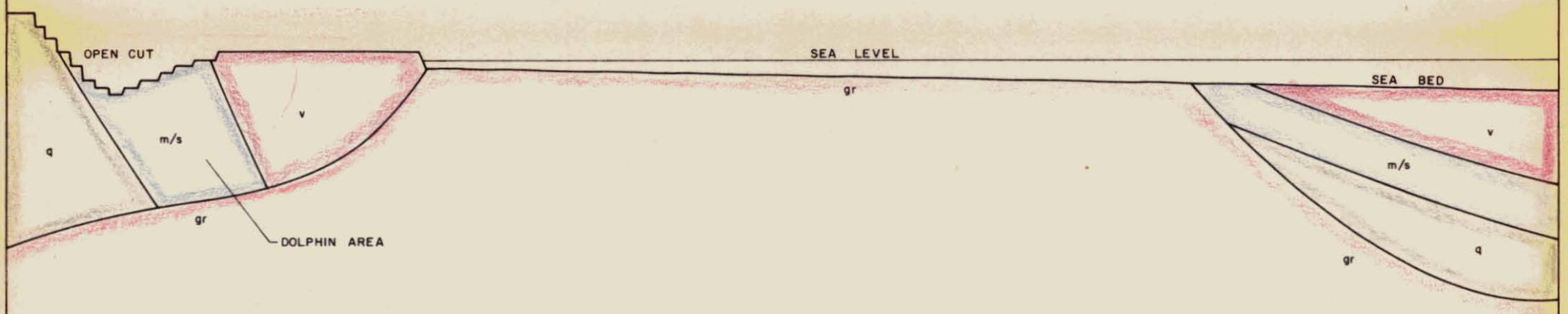
LOCATION PLAN
DOLPHIN EAST AREA
SCALE 1:5000

POSSIBLE MODELS FOR SOUTHERN GRASSY GRANITE GEOLOGY



MODEL A.

MODEL B.



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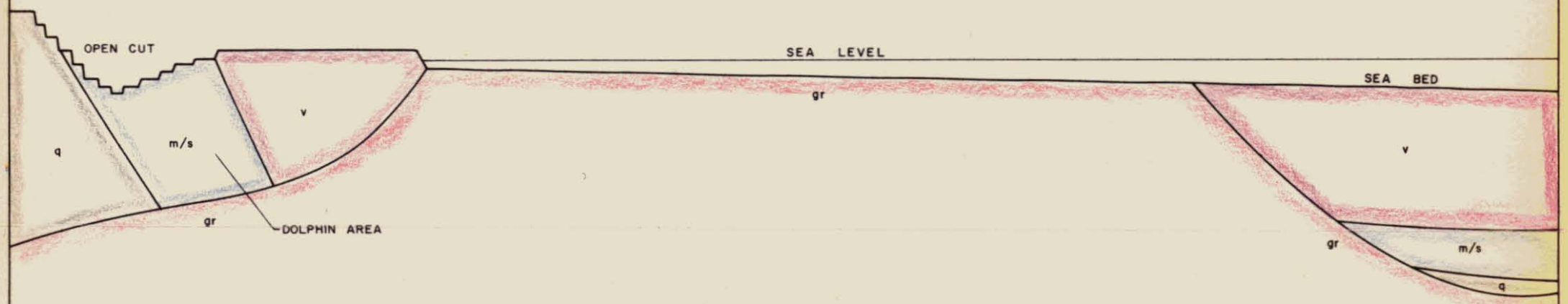

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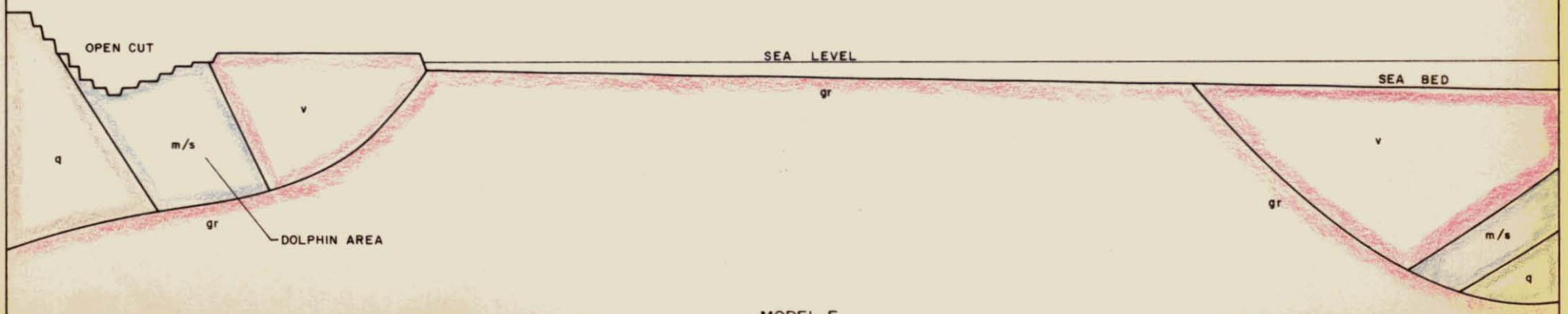

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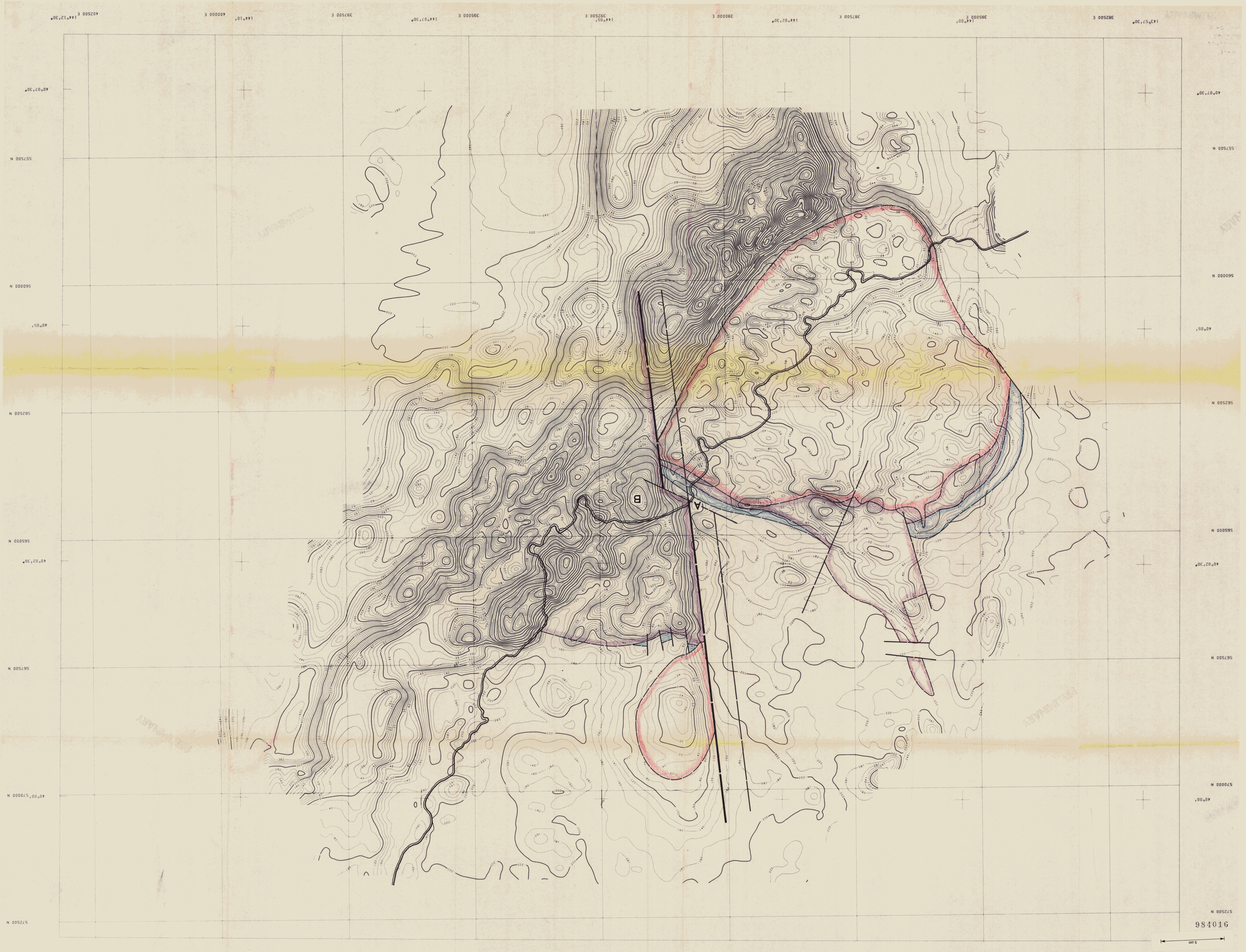
A
B
984016
5 cm