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**MICROFILMED**

PRELIMINARY REPORT ON ALLUVIAL  
CHROMITE DEPOSITS NEAR  
MONTAGU SWAMP - NW TASMANIA

PRELIM. REPORT ON ALLUVIAL CHROMITE  
DEPOSIT NEAR MONTAGU SWAMP NW TAS

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REPORT ON S.P.L. 142  
PERIOD JUNE TO SEPTEMBER, 1975

A. INTRODUCTION

Application was made by Mr. N.M. Thomas for an S.P.L. in the Montagu Swamp or Salmon River district on 24/3/75. The Licence extends from 19/6/75 and was received on 25th June.

The application was made primarily to permit an examination of the chromite deposits discovered prior to 1955 and which were tested by Quest Mining and Exploration N.L. in 1969, and to determine the mode of occurrence of the deposits and whether there were any extensions. Attention was given to chromite because of the world-wide shortage of chromite and of the search being made for chromite deposits throughout the world. Overseas companies are interested in any chromite deposits of economic importance in Australia.

B. GENERAL

The first essential action was to gather copies of previous reports and maps containing the results of geological surveys, airbornemagnetometer surveys and testing campaigns (drilling, ore dressing etc.).

This work was started before the application was made for a Licence because it was necessary to know the positions of the deposits and the geological conditions under which they occurred, before a satisfactory location of an area to be included in a Licence could be made. The investigation was handicapped by the lack of a satisfactory and detailed general map of the district. This handicap was not overcome until Forestry Commission Chart Salmon River (Bluff Point 26B) was obtained.

Two reports have been prepared and are listed in Section D. A copy of each of these reports is attached.

C. REPORTS AND MAPS OBTAINED

The reports, maps, plans, etc. that were obtained and studied are listed in the two reports that are attached to this Report.

D. REPORTS AND MAPS PREPARED.

The following two reports were prepared:

Preliminary Report on Alluvial Chromite Deposit near Montagu Swamp, North-western Tasmania, 30/1/75.

Second Report on Alluvial Chromite Deposits near Montagu Swamp, North-western Tasmania, 28/5/75.

One of the first objectives was to mark the areas tested (and the drill holes) as shown on the plans of Quest Mining and Exploration N.L., on the other maps (general, geological and aeromagnetic). This was difficult and time-consuming because six of the seven maps available had different scales, but was

ultimately achieved.

The tested areas have been marked on a copy of a part of the geological map by Longman and Matthews, and a copy is attached. On Walkers Quarry Area, contours were drawn on the surface and on the bedrock (representing the bottom of the holes), and a cross-section across Walkers Area was prepared, and copies are attached.

#### E. THE CHROMITE DEPOSITS

Previous reports describe the chromite-bearing deposits as gravels deposited on a surface of low relief and subsequently eroded by the present streams so that only remnants situated on the top and flanks of ridges remain. The gravels consist almost entirely of rounded quartz and quartzite pebbles which range up to 2 inches in diameter.

It has been suggested that there may have been some erosion and re-deposition of the gravels, particularly in Walker's Quarry area. At the 300 acre area, the deposit is sand without pebbles. It has been suggested that this may have resulted from re-sorting and re-deposition.

The best exposures of gravels are in two quarries in Walker's Quarry area. In one quarry, a bed of coarse sand and grit overlies a bed of similar matrix with abundant pebbles throughout.

An area of gravel, sand and clay is shown in the south-western corner of S.P.L. 142, but no gravels are shown at the areas tested by Quest.

#### F. AREAS TESTED BY QUEST MINING AND EXPLORATION

The following areas were tested by drilling:

- A. Sapling Road
- B. Sapling Road Extension
- C. Bark Hut Road
- D. Lovells Creek Road
- E. Walkers Quarry
- F. White Road
- G. 300acre Area

As stated in Section D, the above areas are marked on a copy of the geological map.

Most of the areas are widely separated from each other. In six of the areas, the drilling was along roads, and in the seventh area (A), the drilling was concentrated in a small area adjacent to a road. In areas A, B and C the roads were along the tops of ridges, and in areas D and F, the roads crossed streams and continued along the hill sides. In area E (Walkers Quarry area) the drilling was on the side of a hill, and in area G (300-acre Area) the testing was on low and flatter country.

### G. RESULTS OF TESTING

Quest Mining and Exploration company drilled 73 holes with a total footage of 854. General information about the campaign is given in the following table:

<u>Testing Area</u>	<u>No. of holes</u>	<u>Range of depths feet</u>	<u>Range of grades to MHM per c. yd.</u>	<u>Number of holes with trace or less of chromite</u>	<u>Chromite content in magnetic concs. %</u>
Sapling Road	16	1.5-13.5	0-19.0	7	46.5-50.4
and Extension	16	2.5-10.0	0- 2.5	12	50.4
Bark Hut Road	12	2.0-34.0	trace-11.0	4	50.4
300 Acre	9	2.0- 9.0	6.8-24.5	Nil	47.5
Lovell Creek Road	6	2.0-21.0	trace- 6.0	3	47.5
A. Walker Quarry	12	0-68.5	0-70.1	3	48.8-54.5
White Road	3	4.0- 7.0	2.8-9.0	Nil	48.8

The table shows that the only area with grades of possible economic importance was Walker's Quarry area. Moreover that area has the deepest ground. It would appear therefore that the Walker's Quarry area is the only one worth further investigation.

### H. WALKERS QUARRY AREA

On this area, hole 6 had a grade of 70.1 lb. per cubic yard of magnetic concentrates over a depth of 5 feet, and hole 5 had a grade of 56 lb. per cubic yard over 51 feet, the concentrates containing respectively 48.8 and 54.5 per cent of  $\text{Cr}_2\text{O}_3$ . Further, this area contained the deepest ground, hole 2 being 68.5 feet and hole 8 being 64 feet.

Holes were drilled to the west, north-west and north-east of these two holes (5 and 6) with the highest grades, but did not reveal any high grade or fairly deep ground. Two holes (2 and 8) were drilled to the immediate north-east and south-east respectively of hole 5, and proved grades of 29.2 and 13.2 lb. per cubic yard respectively.

The plan and cross-section indicate that deep ground exists in holes 2, 5 and 8. This deep ground could be the margin of an area of deep ground or of a curving deep lead. Further drilling to the south-east, and probably to the south and east, would be necessary to establish if there is an area of deep ground or a deep lead, in those directions.

Any further investigations should be those outlined in the Conclusions to the Preliminary Report of 30/1/75 and the Second Report of 29/5/75, but amended and given below:

1. investigating whether there is deep lead or an area of deep ground to the south-east and probably south and east of Walkers Quarry area by
  - a) conducting ground magnetic survey tests to the

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south-east and east and dependent on the results, a ground magnetic survey of the area.

- b) conducting tests with the seismic method and if successful, a seismic survey of the area
- c) further drilling particularly if the results of the tests and survey in a) and b) are successful.

Source of the Chromite. No information has been obtained as to the source from which the chromite in the alluvial deposits came. In the Second Report it was suggested that the Cambrian basalt, tuff breccia and greywacke should be investigated to determine if these rocks contain magnesite. Subsequently it appeared from the geological map on which Quest's tested areas were marked (see attached map) that the areas tested were with the exception of the Lovell Creek area at or near the junction of the Smithton dolomite with one or other of the overlying Cambrian Formations. All the Cambrian Formations should therefore be tested to determine if they contain chromite.

Agreement. Mr. N.M. Thomas has drawn the attention of several companies to the chromite prospect and has entered into an agreement with Osterreichisc, Amerikanische Magnesit Aktiengesellschaft (OAMAG) to form a joint venture company after obtaining a positive feasibility study of the exploration programme.

A mining engineer (Mr. H. Fruhauf) and geologist (Dr. Pirk1) visited the Salmon River area, but an official decision has not yet been received from OAMAG.

*P. B. Nye*  
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MELBOURNE

28/10/75

SPL 142

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PRELIMINARY REPORT ONALLUVIAL CHROMITE DEPOSIT NEAR MONTAGUSWAMP, NORTH-WESTERN TASMANIAINTRODUCTION

Alluvial deposits containing chromite and smaller amounts of other minerals are present on the south-western side of Montagu Swamp. The deposits are gravels and were discovered and prospected for some time before 1955 by A. A. Walker and his associates. The party applied for an S.P.L. in 1955 or 1956, and in 1959 A.A. Walker applied for a 10 acre mineral lease (15M/59).

By 1963, Quest Exploration held an E.L. (5/68) and Quest Mining and Exploration N.L. was formed in 1969 to take over the E.L. (and other properties). A drilling campaign was carried out in 1969 and 73 holes were drilled. The results were disappointing, and apparently no additional work was done.

The writer has not visited the area and the following information has been based on the reports, etc. listed in a later section of this report.

LOCATION AND ACCESS

The deposits are situated about 20 miles south-west from Smithton. Access is from about the 20 miles peg from Smithton along the Smithton to Marrawah Road. A timber track runs southerly and the deposits are 4 to 6 miles along that track.

PREVIOUS LITERATURE

- Hughes, T.D. Notes on Alluvial Chromite Deposits near Montagu Swamp. Tasmanian Department of Mines Technical Reports No. 1 1956 p.p. 16 - 19.
- Manson, W. St.C. Reports R292, R293, R294, R295, R296 and R297, Tasmanian Department of Mines Technical Reports No. 1, 1956 p.p. 60-68.
- Rio Tinto Exploration Total Magnetic Intensity Map, Aeromagnetic Survey of North West Tasmania, 1956 (Sheet 9).

- Bureau of Mineral Resources, Geology & Geophysics.  
Aeromagnetic Map (G264-1) of Total  
Intensity, Nelson River District,  
Tasmania, 1956.
- Jennings, I.B., Noldart A.J. and Williams E - Geology  
and Mineral Resources of Tasmania,  
Tasmanian Geological Survey Bulletin  
No. 50, 1967.
- Solomon, H. Report on Chromite-bearing Gravel sand  
Sands at Montagu, Tasmania, 5/1/69  
(In Prospectus, Quest Mining & Exploration  
N.L. 11/5/69).
- Volker, J. Report on Chromite Areas, N.W. Tasmania  
(typewritten 26/8/69.)
- Wellington, P.K. Montagu Chromite (letter 26/9/69).
- Jennings, D.J. Report on the visit to Chromite-bearing  
Gravel Deposits in the area south of  
Montagu Swamp, Department of Mines, Tasmania  
(typewritten 7/11/69).
- Longman, M.J., Matthews, W.L. & McNeil, R.D. Geological  
map, Bluff Point, Trowatta Area.

#### GEOLOGY

Hughes (1956) and Jennings (1969) refer to the bedrock of the district in which the chromite-bearing gravels occur as being slate or shale and shale respectively. They state that outcrops are few and that the shales are weathered to a considerable depth and form an ochreous or brownish yellow clay.

Solomon (1969) reports the bedrocks as silicified dolomite, dolomite, sandstone and shale of Proterozoic age. The geological map shows that the three areas (1, 2 and 3), in which gravels were first found have a bedrock of "Younger" Precambrian dolomite with some undifferentiated Cambrian rocks. The map shows also that in the gravel areas to the south and south-west of the first three areas, the bedrocks are "Younger" Precambrian quartzites, siltstones, greywackes, etc. Solomon adds that clay overlies the bedrocks.

The three authors agree that the land surface upon which the chromite-bearing gravels were deposited, was of low relief, and that the gravels were deposited by streams that flowed across the surface.

Subsequent erosion of the gravels occurred and remnants of the gravels are present on ridges resulting from the erosion which has resulted in the existing streams having corroded their courses to a maximum depth of about 200 feet into the Precambrian bedrocks.

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The reports do not indicate clearly the age of the gravels. Hughes states that the former surface was eroded in Pleistocene times by large streams which left well-sorted gravels along their former beds. Jennings considers that the land surface on which the gravels were deposited was a Pre-Tertiary one. The geological map shows extensive areas of Quaternary gravel, sand and clay to the south, south-west and west of the first three areas of gravels found and of most, if not all, of the other areas tested. It is not clear whether these gravels, etc. represent extensions of the gravels that were found to be chromite-bearing.

The streams that deposited the gravels are regarded as large streams that flowed in general northerly directions, but the upper parts of which were subsequently captured by an ancestor of the lower course of the present Arthur River. The upper parts of the earlier streams were thus diverted to the west by the capture.

THE CHROMITE-BEARING DEPOSITS

As indicated above, the chromite-bearing deposits consist of gravels deposited on a surface of low relief and subsequently eroded by the present streams so that remnants only remain. One exceptional area is the 300 acre area where sand is present to the exclusion of gravels. The gravels almost entirely of rounded quartz and quartzite pebbles which range in size up to two inches in diameter. At the south-eastern end of Dark Hut ridge, the pebbles are up to three inches in diameter.

It has been suggested that there might have been some erosion and re-deposition of the gravels, particularly in the Walker's quarry area (Area 1). It has been stated also that the sand at the 300 acre area may also have resulted from re-sorting and re-deposition.

The best exposure of gravels is in Walker's Gravel Pit (Area 1). A bed of coarse sand and grit overlies a bed of similar matrix with abundant pebbles throughout. A smaller exposure is present in another quarry (Area 2). In other areas, possible chromite-bearing deposits have been tested by drilling preceded possibly by pitting.

Many samples were tested by the Chief Chemist & Metallurgist in the Department of Mines Laboratory and it was shown that chromite was the main mineral in the concentrates from the gravels, but that minor amounts of rutile, cassiterite and gold were present.

SOURCE OF THE CHROMITE, ETC.

No primary chromite deposits or rocks containing primary chromite are known in the area and there is almost certainly no local source of the chromite. The only rocks in adjacent districts that could be possible sources of chromite are Cambrian basalts and tuffs and Tertiary basalts, but as far as is known, they do not contain or shed chromite.

As stated in the section on Geology, it is probable that large streams deposited the gravels and that the upper parts of the streams were subsequently captured by the ancestor of the lower part of the Arthur River. Hughes states that the Rapid, and possibly the Norton and Leigh Rivers flowed through the area now occupied by the Montagu Swamp. No definite sources for chromite and cassiterite are known in the region of the headwaters of the above rivers, but tin deposits are known in the Balfour field to the east of that region. Ultrabasic rocks may be present in the region and chromite might be shed from them. In general, however, it is more likely that the chromite would come from a source nearer the area (B/S) than the headwaters of the above streams. Gold could be shed from any mineralised formations (especially those of copper and lead-zinc) in the region. In addition to tin deposits, copper deposits are also present at Balfour. Nothing can be said at this stage about possible sources of rutile.

TESTING

Quest Mining and Exploration N.L. conducted a testing campaign of the area during June to August, 1909. In six separated parts of the area, a total of 73 holes were drilled with a total footage of 354. The results were reported to be disappointing because economic grades were obtained only in two holes, namely A.W.Q.5 which averaged 56 lb. of magnetic concentrate per cubic yard over 51 feet, and A.W.Q.6 which averaged 70.1 lb. over 5 feet. The holes were in the Walker's Quarry Area).

The six test areas and some general particulars about the holes in them, are given below.

<u>Test Area</u>	<u>No. of holes</u>	<u>Range of depths feet</u>	<u>Range of grades to MHM per c. yd.</u>	<u>Number of holes with trace or less of chromite</u>	<u>Chromite content in magnetic concs. %</u>
Sapling Road	16	1.5-13.5	0-19.0	7	46.5-50.4
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Lovell Creek Road	6	2.0-21.0	trace-6.0	3	47.5
A. Walker Quarry	12	0-68.5	0-70.1	3	48.8-54.5
White Road	3	4.0- 7.0	2.8-9.0	Nil	48.8

The bedrock was at the lowest levels in holes 2, 5 and 8 in Walker's Quarry area and it was claimed that this deep ground could not be traced. However, holes that were intended to trace it, were drilled to the north-west, north and west, and it is still possible that the deep ground is in the sharp bend of an in-filled gutter to the east and south or south-east respectively. Holes drilled in those directions from 2, 5 and 8 would have tested such a possibility. First hand knowledge of the vicinity might provide good reasons for not drilling such holes. The highest grade holes are in the area of the suggested bend.

#### AEROMAGNETIC MAPS

Copies of two aeromagnetic maps were available. The Nelson River Map of total intensity was based on surveys made by the Bureau of Mineral Resources, Geology and Geophysics in 1956. The other map was one sheet of a series based on total intensity surveys made for Rio Australian Exploration.

The Nelson River map covers only a small area in the south-western corner of E.L. 5/68. No important anomalies are present. Immediately south or south-east of the south-western corner of former E.L. 5/68, a magnetic high of 250 gammas is present, and it may correspond to the Nelson River iron deposit, but this possibility has not been investigated.

On the Rio Australian sheet, no intensely high anomalies are present. However weak anomalies are distributed within E.L. 5/68 as follows:-

In south-western corner - Three anomalies of 60 gammas

In south-eastern corner - Anomalies of 70 and 110 gammas

In north-western corner - Anomalies of 70, 90 and 100 gammas

Immediately east of the south-eastern corner and outside the E.L., an anomaly of 350 gammas is present.

Within an area of about 30 square miles in which drilling was conducted there are two anomalies of 70 and 100 gammas. No anomaly is present in any of the six areas tested by drilling by Quest Exploration and including the Walkers Quarry area in which two drill holes gave the highest chromite contents of the holes drilled. The holes and the contents were:-

- A.W.Q.5      56 lb. per cubic yard of magnetic concentrates over a depth of 51 feet.  $\text{Cr}_2\text{O}_3$  54.5%.
- A.W.Q.6      70.1 lb. per cubic yard of magnetic concentrates over a depth of 5 feet  $\text{Cr}_2\text{O}_3$  48.8%.

It is clear that the aeromagnetic surveys do not reveal (by anomalies or other features) the alluvial chromite deposits with chromite contents that were revealed by the drill holes. Investigation would be needed to determine the grade and thicknesses necessary to give a magnetic "high".

It might be desirable to examine the locality east of the south-east corner of former E.L.5/68 in which an anomaly of 350 gammas is present, and establish the source of the anomaly.

#### FUTURE PROSPECTS OF THE AREA

The alluvial deposits tested to date have been remnants (left on ridges) of gravel deposits that probably once extended over the whole or most of the area. These remnants were tested by Quest Mining and Exploration N.L., and Mr. J. Volker who reported on the testing, stated that, out of an aggregate of 73 holes drilled in six separate areas, only two holes showed grades of economic importance, and that the results were disappointing.

Mr. D. J. Jennings, Geologist, of the Tasmanian Department of Mines, reported on 7/11/69 that to increase the proven reserves, the requirements would be:-

- 1) Increase the areas of typical chromite-bearing gravels, or locate new chromite-bearing deposits in a different situation
- 2) increase the known thickness of chromite-bearing gravels
- 3) improve greatly the chromite values of the gravels

In other words, additional chromite-bearing alluvial deposits, and preferably thicker and richer ones, would have to be located.

Possible alluvial deposits that might be sought and tested would include:-

- a) Deposits along existing streams.  
Jennings states that "existing streams were reported panned at intervals with discouraging results". It would appear that this prospecting offers no chance of success.
- b) Extension of the areas occupied by the remnant gravels.  
In this connection, Jennings reports that "...as a fair network of roads serve the area, no major ridge should have been missed".
- c) New deposits in a different situation.  
Jennings stated that "Although the density of the scrub precluded systematic sampling, most areas have apparently been entered (with the exception of that part south of the Arthur River) without success". He stated also that "In quarries, road-cuttings and drill-holes, ochreous clay soils directly overlie weathered Precambrian shales and siltstones, so no gravel deposits are suspected overlain by clays and soil. Further he stated that "A number of borehole sites have been located in suitable poorly exposed low-lying areas; prospect pits were reported dug in, and marginal to, swamp areas".
- d) Areas occupied by swamps. The only reference to testing of areas occupied by swamps is that given above in (c), and it is not known whether the testing has been detailed or not and whether it covered much of the areas occupied by the swamps. Access for a drilling plant might be difficult, if not, impossible.

e) Quaternary gravel, sand and clay.  
 Extensive areas of these are shown on the geological map. It is not known at present whether these correspond to the Pleistocene gravels referred to by Hughes, and whether they correspond or not to the chromite-bearing gravels of Hughes and Jennings. However, they occur largely, if not wholly, to the west, south-west and south of the six areas that were tested. It may be desirable to test them but not before geological inquiries and field investigations have been made.

f) In-filled valleys (or deep leads) including extension of the thick gravels in, and near, Walker's quarry.  
 The existing information based on the results of the drilling of the six areas indicates that, excepting the 300 acre area, the bedrock is at the lowest level (160 feet) at hole 8 in the Walker's Quarry area. Moreover, the gravels are the thickest in that vicinity (63.5 feet in hole 2 and 64 feet in hole 8). Moreover, the highest grades were in holes 5 and 6 in that area.  
 These factors suggest that these gravels may possibly be part of a deep lead. The drill holes in the area prove that there is no extension of the thick gravels to the north-east, north, west and south-west. No holes except No. 3 to the south-south west were drilled to the east, and south of the thick gravels. It may be that the gravels are not exposed in these directions or that the locality is swampy, and that holes were not drilled for those two, or other, reasons. An extension could be postulated to the east, and that would be towards the 300 Acre area where the lowest level of the bedrock is 100 feet. At the 300 Acre area, the alluvial material is chiefly coarse sand, and the postulated lead may have entered an estuary or the sea at that locality.

There may also be an extension of the lead south from Walker's Quarry to Lovell Creek Road area where the lowest level of bedrock reported is 153 feet.

The above lead is only postulated at present and geological inquiries and field investigations would be necessary before it can be considered that a lead is present.

Geophysical surveys could help to prove whether the postulated lead is present or not. The aeromagnetic surveys provide no information about the chromite deposits. A ground magnetic survey might be more successful, and at least a preliminary test could be made. If successful, a more extensive survey should be made in the search for the extensions of the Walker's Quarry lead and any others likely to be present. Seismic surveys might possibly prove whether any valleys were present in the bedrock, and preliminary tests could be made with this method of survey.

### CONCLUSIONS

The testing by drilling conducted by Quest Mining and Exploration N.L. showed that, though 73 holes were drilled, the gravels in only two holes were proved to have grades of economic importance. Based on this testing, the exploitation of the gravels would not be economically possible.

Some investigations could be conducted to ascertain the possibility of locating more extensive areas of chromite-bearing gravels. These investigations would include:-

- 1) Investigating whether a postulated deep lead exists or not
- 2) Investigating whether the Quaternary gravels, sands and clays to the south and west of the tested areas are extensions of the chromite-bearing gravels in those areas
- 3) Investigating the possibility of using geophysical surveys to determine if chromite is present and also whether a deep lead is present.

P. B. NYE  
MELBOURNE  
30/1/75

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SECOND REPORT ON ALLUVIAL CHROMITE DEPOSITS  
NEAR MONTAGU SWAMP, NORTH-WESTERN TASMANIA

INTRODUCTION

A preliminary report was prepared on 31/1/75. Since then endeavours were continued to obtain further information about the district and, if possible, about the chromite deposits. As a result, additional maps, reports, etc. were obtained and these, and the information in them in regard to the chromite deposits, will be described below:

A Special Prospectors Licence of 23.2 square miles has been applied for by Mr. W.H. Thomas.

PREVIOUS LITERATURE

The following report was obtained:

Longman, H.J. and Matthews, W.L. The Geology of the Bluff Point and Trowutta quadrangles. Tasmanian Department of Mines Technical Reports No. 6, 1961, pp 48-54.

The above report contained a geological map with the title of "Geological Reconnaissance Bluff Point - Trowutta Area". This is the map of which we had a part, and which was listed in the Preliminary Report.

The following Forestry Commission chart was obtained:

Salmon River (Bluff Point 26B)

This map was the first satisfactory general and topographical one obtained and was very useful in considering the geology and topography of the district.

Other maps or charts obtained were:

- (1) Tasmanian Department of Mines, North Sketch Map
- (2) Tasmanian Department of Lands County Charts Wellington 1A and 1C.

GEOLOGY

The geological report on the Bluff Point and Trowutta quadrangles contained additional information to that previously available, and enabled a much better interpretation of the geological map.

The bedrocks of the Licence Area are mainly "Younger" Precambrian in age, and in the north-eastern half of the area (in which all known occurrences of the alluvial chromite are present) consist mainly of the Smithton Dolomite.

A belt of Cambrian rocks (mainly undifferentiated) is present in the centre of the area of Smithton Dolomite and has a north-north-westerly trend through the area. To the south-east of the south-eastern corner of the Licence area, there are several areas of "basalt, tuff breccia and greywacke" ranging in area up to about 1.5 square miles.

No gravels are present in the area in which the alluvial

quartzite has been found. In the south-western part of the Licence area, there are, however, considerable tracts of Quaternary "gravel, sand and clay". These tracts have a general north-westerly trend and are sub-parallel to, and on the north-eastern side of the Arthur River. While this association might suggest that the gravel, etc. was deposited by the Arthur River, it is very likely that the gravels etc. were widespread over the district, and the existing association has resulted from the erosion by the Arthur River and the removal of much of the former widespread formation of gravels, etc.

The report describes the Quaternary deposits as follows:-

Extensive deposits up to 30 feet thick of interbedded quartzite gravel, sand, clay and peat overlie the Smithton Dolomite, and angular quartzite gravel, peat and sand varying in thickness from six inches to several feet cover the Henty Surface. Gravel also occurs on the valley walls and isolated areas on this surface".

It should be noted that the Henty Surface refers to the "land surface" of "low relief" described in the Preliminary Report.

THE QUATERNARY DEPOSITS

No additional information has been obtained on the deposits, and it has to be assumed that the gravels in the area tested by Quest represent one or more of the following:

- a) isolated areas of gravels, and angular quartzite gravel etc. on the Henty Surface
- b) gravels on the valley walls on the Henty Surface
- c) deep leads under part of the Henty surface
- d) gravel deposits formed by erosion of the gravels, etc. on the Henty surface and re-deposition in the valleys of present day streams.

A close investigation of the areas tested by Quest, and particularly in relation to the bedrocks of those areas shows that

- a) the areas have a bedrock either of Smithton Dolomite or on small areas of undifferentiated Cambrian rocks
- b) with one exception, the areas are close to the junctions of the main belt of undifferentiated Cambrian rocks with the Smithton Dolomite. The belt has a general north-north-westerly trend
- c) four of the tested areas are on the south-western side, and two on the north-eastern side, of the belt of Cambrian rocks.

SOURCE OF THE CHROMITE

As described in the previous Section, the areas tested by Quest are arranged along both sides of the belt of undifferentiated Cambrian rocks.

To the south and south-east of the south-south-eastern end of that belt (and to the south of the Arthur River) there is a much larger area of undifferentiated Cambrian rocks with at least eight small separated areas of the "basalt, tuff breccia and greywacke" in it. The size of the areas of basalt, etc. ranges up to about 1.5 square miles. The two areas of the undifferentiated Cambrian rocks have a general north-north-westerly trend. If a former stream flowed to the north-north-west before being beheaded by the Arthur River (as suggested in the Preliminary Report), it would cross the areas of basalt, etc. (or some of them) and then traverse the region in which the areas tested by Quest are situated. If the basalts contain some chromite (although it has not been shown to do so) they would represent the source of the chromite in the alluvial deposits. Enquiries will be made to the Tasmanian Department of Mines as to whether specimens from the basalts have been microscopically examined and whether they contain chromite.

A possible alternative source could be some other rock or rocks associated with the undifferentiated Cambrian formations.

POSSIBLE DEEP LEAD

In the Preliminary Report, it was stated that no holes had been drilled to the east and south or south-east of the deep ground in the Walker area, but that first hand knowledge of it provide some good reasons for the absence of drill holes. Forestry Sheet 268 shows that there is a westerly flowing creek to the east of the deep ground with a tributary coming from the south-east to join it. The combined creek continues to the west and joins Victor Creek, a south-flowing tributary to the Salmon River.

It is possible that in the valley of the creek to the east of the deep ground, conditions may not have been suitable for access and for drilling. A field examination would be necessary to determine whether such conditions exist.

MAPS AND PLANS

It was intended that some maps and plans should accompany the Preliminary Report, but the report was issued before the maps were completed. However, the additional information gained after the Provisional Report was issued will enable a better set of maps and plans to be prepared. The set has not yet been completed but will be as soon as possible and will be issued even if this Second Report is distributed at an early date.

- 4 -

CONCLUSIONS

The conclusions remain as in the Preliminary Report but the investigations should include

4. Investigating the Cambrian "basalt, tuff breccia and greywacke" to the south-east of the tested areas to determine if basalts or other associated rocks contain chromite.

*A. Betz*  
(P.B. HY)

10 12011 M  
MAY 21, 1975

ADDENDUM

Confirmation of the statement in the above report that the conditions in the stream valley to the east of Walker's area, might not be satisfactory for access and drilling, was received during an interview with Mr. Vogler who supervised the drilling operations and reported toquest explorations. Mr. Vogler stated that the conditions along the valley of the creek were swampy and that no hole was drilled in it but No. 8 hole was drilled to the north of the creek.

*A. Betz*  
(P.B. HY)

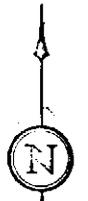
MAY 29, 1975

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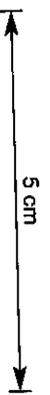


SCALE  
1" = 2 MILES

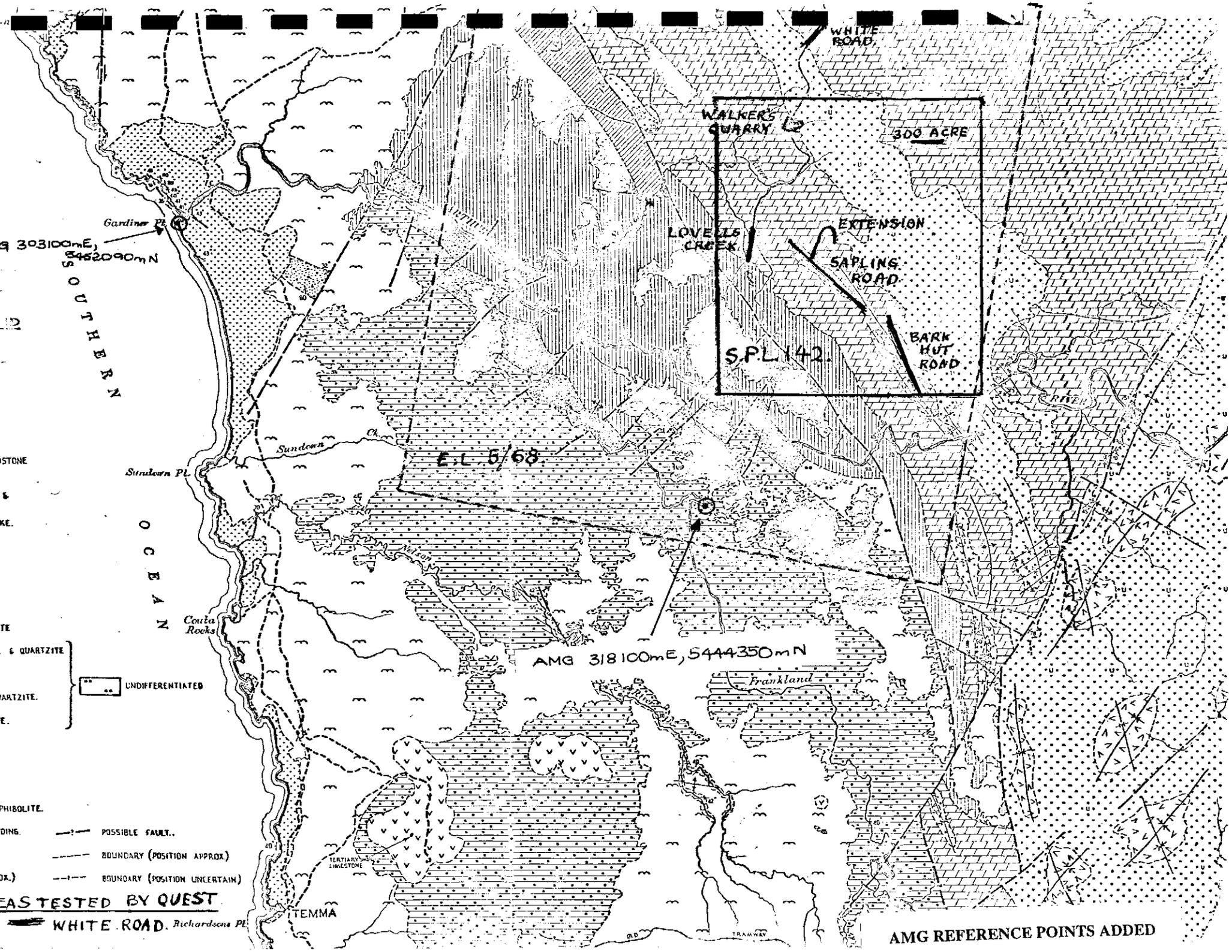
AMG 303100mE, 8452090mN  
Gardiner Pt.

LEGEND

- QUATERNARY
- 2 SAND DUNES.
- 2 GRAVEL, SAND & CLAY.
- TERTIARY
- 2- BASALT.
- PERMIAN
- 19 UNDIFFERENTIATED, MUDDSTONE SANDSTONE & TILLITE.
- CAMBRIAN
- 3 BASALT, TUFF BRECCIA & GREYWACKE.
- 12 SILTSTONE & GREYWACKE.
- 57 DOLOMITIC BRECCIA.
- 9 UNDIFFERENTIATED.
- YOUNGER PRECAMBRIAN
- 21 SMITHTON DOLOMITE
- 25 BRYANT HILL QUARTZITE
- 14 SILTSTONE, GREYWACKE & QUARTZITE
- 10 BLACK SILTSTONE.
- 19 GREEN SILTSTONE & QUARTZITE.
- 47 UNASSIGNED QUARTZITE.
- 20 QUARTZITE & SLATE.
- OLDER PRECAMBRIAN
- 19 KEITH BEDS.
- BASIC DYKES & AMPHIBOLITE.
- STRIKE & DIP OF BEDDING.
- FOLD AXIS.
- FAULT (POSITION APPROX.)
- POSSIBLE FAULT.
- BOUNDARY (POSITION APPROX.)
- BOUNDARY (POSITION UNCERTAIN)



1961 AREAS TESTED BY QUEST  
WHITE ROAD. Richards Pt.



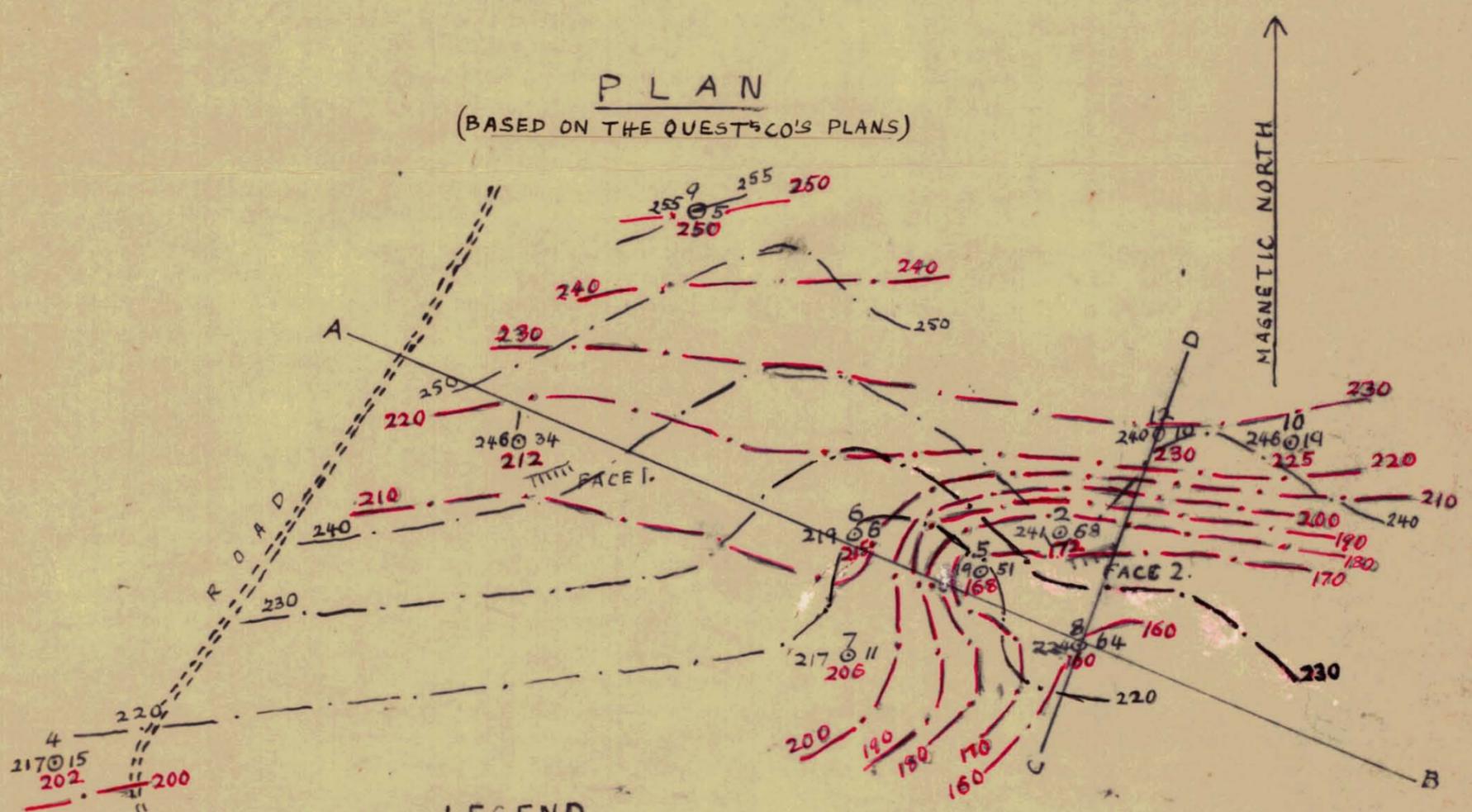
AMG REFERENCE POINTS ADDED

477020 018

75-1145

# SALMON RIVER ALLUVIAL CHROMITE DEPOSITS. WALKERS QUARRY AREA.

## PLAN (BASED ON THE QUEST CO'S PLANS)



### LEGEND

- HOLE NUMBER
- SURFACE LEVEL (FEET)  $\odot$  DEPTH (FEET) DRILL HOLE.
- BOTTOM LEVEL (FEET)
- 200 — SURFACE CONTOUR.
- - - 170 - - - BOTTOM CONTOUR.
- TTTT QUARRY FACE

### SCALES

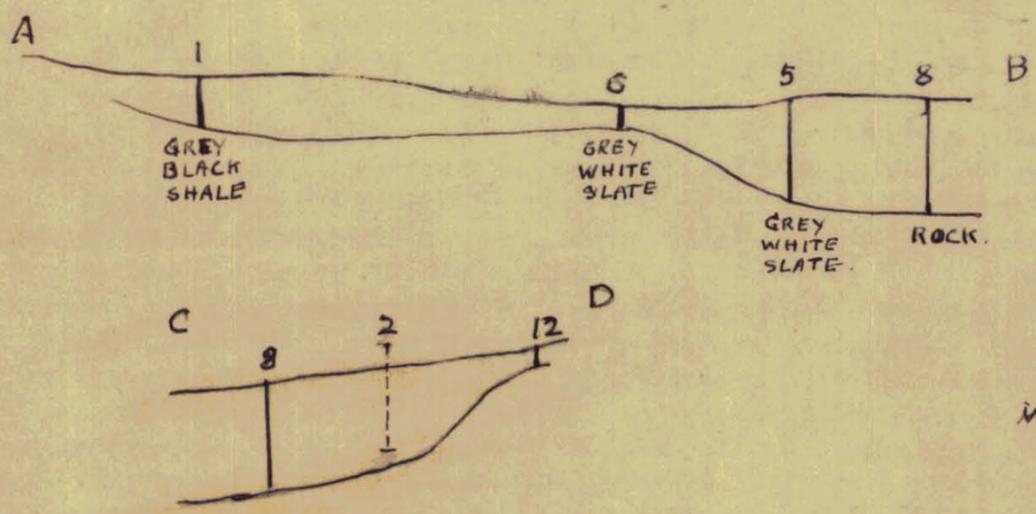
1 INCH TO 100 FEET.

NOTE. THERE SHOULD BE A WEST-FLOWING CREEK IN THE SOUTHERN PART OF THE MAIN PART OF THE PLAN. IT WOULD, IF SHOWN, RESULT IN ALTERATIONS TO THE POSITIONS OF SOME OF THE SURFACE CONTOURS.

*P.B.N.*

3  
243 @ 15  
218

## CROSS SECTIONS AB AND CD.



*Based on information in Quest Co's report and plans.*  
*P.B.N.*  
*3/11/75*

