REPT.BK.NO. 74/157

MT. FALKLAND BARITE DEPOSITS - NO. 3 LODE

Sec. 4, Hd. Oratunga, Co. Taunton

J.G. OLLIVER

Department of Mines
South Australia ——

DEPARTMENT OF MINES
SOUTH AUSTRALIA

GEOLOGICAL SURVEY
ENVIRONMENT & RESOURCE DIVISION

MT. FALKLAND BARITE DEPOSITS - No. 3. LODE
Section 4, Hd. Oratunga, Co. Taunton

by

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Rept. Bk. No. 74/157
G.S. No. 5475
DM. No. 772/73

January 30, 1975

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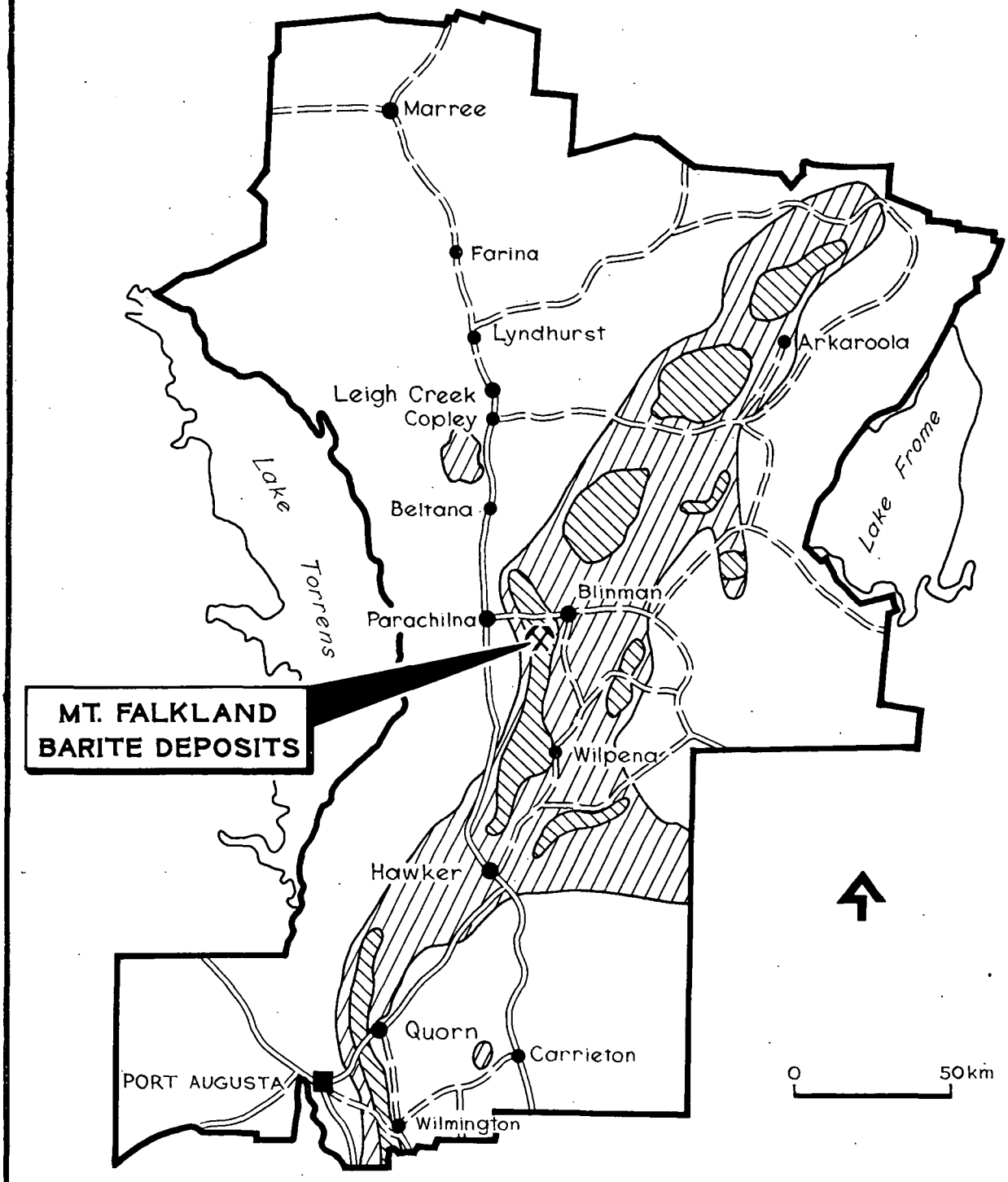

ENVIRONMENTAL AREAS

- Class A
- Class B
- Class C

- Country Township
- Special Township
- Main road
- Secondary road

DEPARTMENT OF MINES — SOUTH AUSTRALIA

INDUSTRIAL MINERALS SECTION	Drn. J.O.	FLINDERS RANGES PLANNING AREA	SCALE: 1:2 000 000
	Tcd. J.W.	**MT. FALKLAND BARITE DEPOSITS**	S10932 Fa2
J.G. OLLIVER SEN. GEOLOGIST	Ckd. A.F.	LOCALITY PLAN	DATE: 30 July 1970
	Exd.		

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DEPARTMENT OF MINES
SOUTH AUSTRALIA

Rept.Bk.No. 74/157
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MT. FALKLAND BARITE DEPOSITS - No. 3 LODE
Section 4, Hd. Oratunga, Co. Taunton

ABSTRACT

Three barite deposits in the scenic A.B.C. Range, south of Parachilna Gorge, have produced only 219 tonnes since 1942.

The barite mineralisation, which occurs in conformable brecciated zones within the Precambrian A.B.C. Range Quartzite of the Wilpena Group, was probably derived from the underlying Brachina Formation siltstones.

Results to date at No. 3 Lode indicate that much of the barite is industrial grade suitable for pigments.

An estimated 3 300 tonnes could be obtained by simple gouging operations.

An expected 11 500 tonnes of barite have been inferred, comprising 4 500 tonnes above 80 metres and 7 000 tonnes above 60 metres. Total potential is estimated at 17 000 tonnes if the lode is continuous at depth.

Underground mining is not practical due to the relatively flat dip of the lode. Open cutting will require the removal of about 22 000 cubic metres of overburden from an area of 4 100 square metres. These workings will be hidden from much of the valley floor by a stand of native pine on the lower slopes.

Either drilling or driving exploratory adits is required to determine dip and width of lode, prove reserves and confirm quality of subsurface barite.

Conversion of MC.7235 to a Mineral Lease is recommended as exploitation is considered to be in the interest of the State. Mining should be planned with due regard for the high scenic qualities of the Arkona Valley.

INTRODUCTION

Following gazettal of an application to convert Mineral Claim 7235 to a Mineral Lease, an objection was received from the Deputy Director of Planning on 23rd January, 1974.

The basis of the objection was that the proposed lease does not lie within one of the specified localities in Class A Environmental Areas as defined under the Flinders Ranges Planning Area Development Plan and its allowance would contravene the provisions of the plan.

The Flinders Ranges Planning Area Development Plan, which was authorised on 8th February, 1974 states the following criteria for mining operations in Class A Environmental Areas.

> "No mining activities should take place in these areas except in localities where mineral deposits are of paramount significance and their exploitation is in the State or National interest. These localities are: the western face of the Ranges near Depot Creek; the western face of the Heysen Range; portion of Moralana Valley; portion of the Mount Hack and Mount Bro areas; portion of the Stirrup Iron Range; portion of the east Commons; the Mount Painter-Freeling Heights area, and other such localities as may from time to time be determined. Mining in these localities should only take place under the most stringent conditions following precise delineation of the sites concerned by planning regulations."

The Mt. Falkland Barite Deposits were visited by the writer on four occasions during 1974 -

- on 27th February, 1974 with D.C. Scott (Geologist, Industrial Minerals Section) during general reconnaissance of mineral deposits near Parachilna Gorge.
- on 14th, 15th and 16th August, 1974 with R.J. Harris (Field Assistant), when the three barite lodes were mapped by stadia theodolite. The attached plans 74-995 and geological sections 74-996 and 74-996/A for No. 3 Lode are based on this survey. No. 1 and No. 2 Lodes are reported separately (Olliver 1975 a and b).
- on 21st August, 1974 with Mr. N. Hiern (Supervising Geologist, Environment and Resource Division), M.E.

Plate IBKI 014

Neg. 264 Lq

Mt. Falkland Barite Deposits, No. 3 Lode

A.B.C. Range looking to the south-east from access track along valley.
Bench and white barite outcrop are in centre right of conical hill.

Mathews (Inspector of Mines), P. Brooke-Smith (Environmental Officer, Department of Environment and Conservation) and H. Bakker (Ranger, Flinders Ranges National Park).

- on 16th October, 1974 with R. J. Harris (Field Assistant) to check location of corner posts following discussions with the claimholder in Port Pirie on 15th October, 1974.

Five samples ofbarite were submitted to the Australian Mineral Development Laboratories for chemical analysis and the determination of specific gravity and reflectance. Two of the samples were also submitted for petrological examination. These results are attached as the Appendix.

LOCATION

Three barite deposits are located in section 4, Hd. Oratunga, Co. Taunton. The No. 1 and No. 3 Lodes are 3.5 kilometres apart, being 2.7 kilometres east south-east and 5.6 kilometres south south-east of Mt. Falkland respectively (see plan no. S10931). The deposits lie within a Class A Environmental Area as defined in the Flinders Ranges Planning Area Development Plan.

Access is via a track which leads southwards off the Parachilna Gorge Road, 17.6 kilometres west of Blinman. This track continues southwards to the Aroona Valley.

The heavy rain and subsequent infrequent use during 1974 has caused deterioration of the track such that it is now negotiable only by four wheel drive vehicle.

The No. 3 Lode is 9.6 kilometres south of the Parachilna Gorge Road. A track has been bulldozed 0.6 km eastwards from the valley track to a camp site and thence up

the ridge to the lode (see plate IBKIO14and Plan no. 74-995) which is situated near the creat on the western side of the A.B.C. Range.

The valley is covered by a dense growth of native pines and the surrounding country provides superb scenic views, particularly looking westwards towards Lake Torrens (see plate 10333).

MINERAL TENURE

The No. 1 and No. 2 Lodes have been held intermittently since 1943 and have also been referred to previously as -

Angorichina

Parachilna Gorge

A.B.C.

MC.7235 covering 4 hectares over No. 3 Lode was registered for R.C. Bairstow on 18.8.71 under the repealed Mining Act, 1930-1962.

An application to convert to a mineral lease was lodged on 1st July, 1973. Granting of the lease was deferred pending investigation of the objection from the Deputy Director of Planning. The Senior Warden granted a reduction in area to 0.21 hectares on 1st August, 1973 (Plaint No. 500/73). Actual area of the claim is 0.64 hectares, based on the four corner posts as shown on plan no. 74-995.

The camp site, access track, compressor and loading chute formerly within the claim of 4 hectares, now lie outside of MC.7235 and the area applied for as a lease.

THE WORKINGS

A bench, 40 metres long and up to 8 metres wide, has been cut into the hillside near the centre of the barite lode

Plate 10333 Mt. Falkland Barite Deposits, No. 3 Lode

SLIDE 10333 Panoramic view looking westwards towards Lake Torrens from workings.

at the 80 metre level (see Plate no. IBKI 014).

Barite ore was loaded onto trucks via a chute from the bench near Survey Station II to the track 10 metres below.

Some barite has been mined from a shallow open cut, which has been partly backfilled, below the bench.

A camp site has been established on the access track, 200 metres west south-west of the bench, at the 10 metre level.

The track from the camp to the barite lode has three bends, the top turn onto the bench being difficult to negotiate in a vehicle. Also the last 100 metres of the track from Survey Station III to the bench is particularly steep.

PRODUCTION

There was no recorded production from the Mt. Falkland deposits from 1943 to 1968 apart from a trial load in 1959 from No. 2 Lode. Activity was hampered by the difficulty of transporting the ore from the pits down to the valley floor as well as the lack of markets (Mansfield, 1947).

Production data submitted to the Department of Mines are detailed in Table 1

Table 1

Production of Barite, Mt. Falkland

Year	Lode	Tenement	Tons	Total per Lode	Equivalent Tonnes
1943-58	No.2	MC.2416	nil		
1959	"	"	7		
1960-68	"	"	nil	7	7
1969	No.1	MC5327	63		
1970	"	"	6		
1971	"	"	20	89	90
1972	No.3	MC.7235	80		
1973	"	"	40	120	122
			TOTAL	216	219

GEOLOGICAL SETTING

The accompanying Regional Geology plan no. S10931 is adapted from Blinman part of PARACHILNA (Dalgarno et al., 1964 and Forbes, 1972).

The barite lodes occur within the A.B.C. Range Quartzite, part of the Wilpena Group of Marinoan age within the Precambrian Adelaide System sediments. This unit, a feldspathic sandstone characterised by ripple marking, cross bedding and heavy mineral laminae, forms the prominent A.B.C. Range which extends from Wilpena Pound northwards for 50 kilometres to beyond Parachilna Gorge.

The deposits are at the base of the A.B.C. Range Quartzite near the contact with the underlying siltstones of the Brachina Formation. This lower unit is the host rock for the large and extensive deposits of barite at Oraparinna and for other lodes elsewhere in the Flinders Ranges. The sequence dips to the west at about 30°.

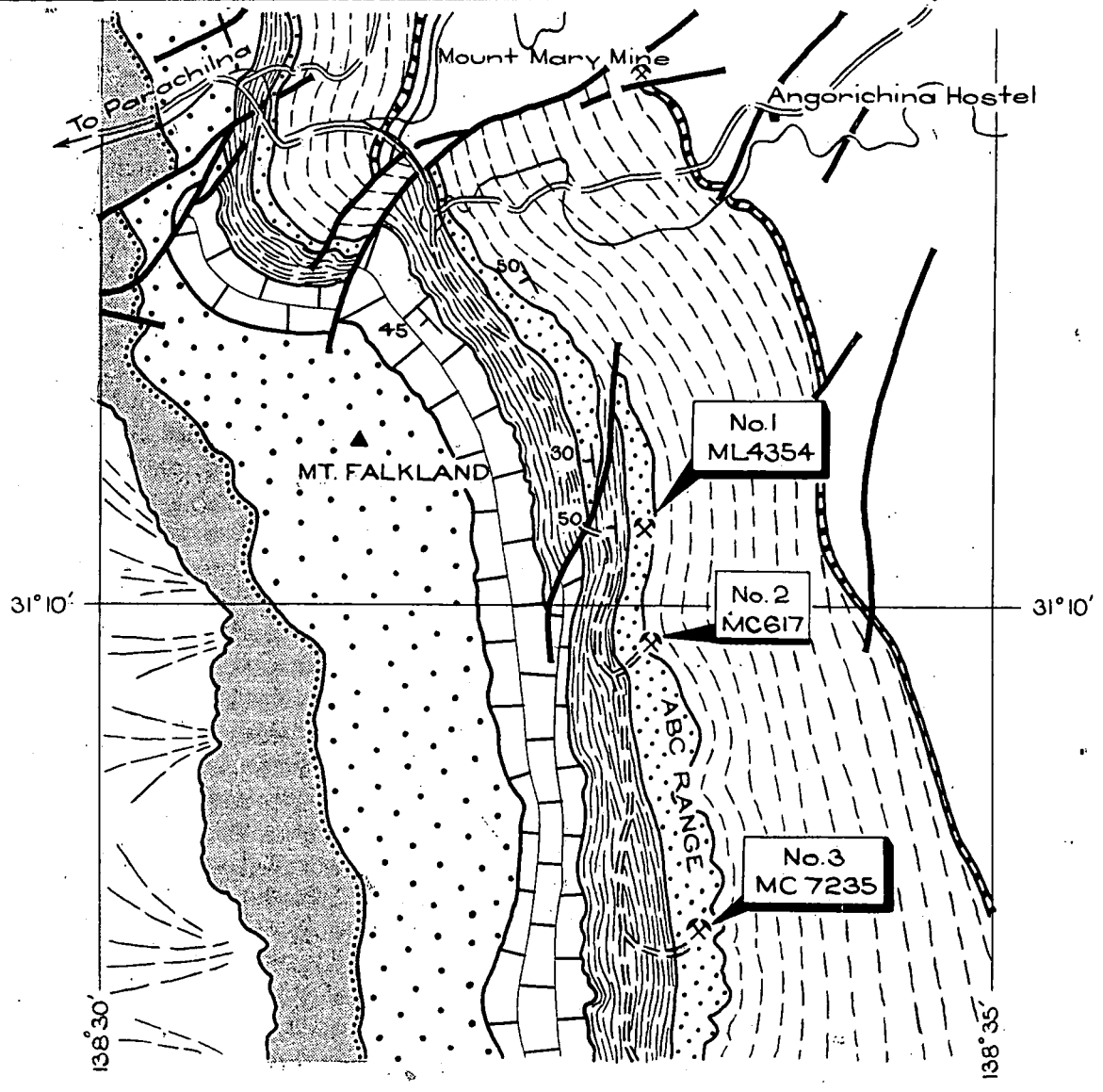
Lateral secretion of barite from the Brachina Formation and subsequent deposition in open fissures caused by faulting in the adjacent A.B.C. Range Quartzite is the probable mode of formation of the Mt. Falkland Lodes. Two similar lodes (the Mt. Hayward deposit) are reported by South Australian Barytes Limited (1970) near Aroona Ruins, 10.5 kilometres south of the Mt. Falkland deposits.

GEOLOGY OF THE NO. 3 LODE

Topography

The barite lode crops out on a spur which slopes from 20° to 30° to the west (see geological sections) being slightly shallower than the dip of the country rock.

Tree growth is moderate and undergrowth sparse.



LEGEND

SCALE IN KILOMETRES
0 1 2

QUATERNARY — Scree and Alluvium.

ADELAIDE SYSTEM

CAMBRIAN — HAWKER GROUP
- WILKAWILLINA LIMESTONE and PARACHILNA FORMATION.
- POUND QUARTZITE.

WILPENA GROUP
- WONOKA FORMATION – Grey calcareous shale with flaggy limestones.
- BUNYEROO FORMATION – Grey, green & red thinly bedded shales, dolomitic in part.
- A.B.C. RANGE QUARTZITE – Feldspathic sandstone ripple marked and crossbedded.
- BRACHINA FORMATION – Brown and green thin bedded siltstone.
- NUCCALEENA FORMATION – Cream to pink, well bedded dolomite.

UMBERATANA GRP.

DEPARTMENT OF MINES — SOUTH AUSTRALIA

INDUSTRIAL MINERALS SECTION	Drn. J.O.	MT. FALKLAND BARITE DEPOSITS	SCALE: 1:63,360
	Tcd. J.W.	FLINDERS RANGES	S10931
J. G. OLLIVER	Ckd. A.F.	REGIONAL GEOLOGY	Fa2
SEN. GEOLOGIST	Exd.		DATE: 30th July 1974

Vegetation comprises the dry woodland association of Callitris columellaris with Triodia irritans and xanthorrhoea sp. understorey (Brooke-Smith, 1974).

Immediately south of the bench, an area of about 740 square metres (outlined on plan no. 74-995) contains only five trees. Beyond this area, trees are relatively thick and evenly spread. (See plate IBKI 014)

Country Rock

At no. 3 Lode, the A.B.C. Range Quartzite varies from friable feldspathic sandstone to hard, dense quartzite. Colour ranges from white to grey to light shades of red, brown, yellow and purple. Cross bedding is common as are thin interbeds of mica schist. Bedding planes contain scattered flakes of muscovite.

Well developed jointing has produced abundant scree of rectangular blocks and fragments. Joint planes are often coated with red-brown to black iron oxide.

Outcrop is particularly poor on the southern side of the spur near Survey Stations VI and VII.

Adjacent to the barite lode, bedding varies in strike from 162° to 185° with an average of 170°. Dips range from 22° to 46° westwards and average 34°.

The Barite Lode

The combination of topography and low westerly dip has resulted in the arcuate shape of the barite outcrop. This outcrop consists almost entirely of white crystalline barite and is low and continuous on the northern side of the spur near the bench. In contrast, outcrop is poor on the southern side, generally being obscured by quartzite scree. In places, the only surface indication is scattered cubic fragments of barite.

Inclusions of country rock up to 70 cms are common at the eastern end of the outcrop, 18 metres east of the bench and also east of Station I. The latter outcrop also contains patches of goethite. Elsewhere, goethite is common along the footwall portion of the barite lode, particularly near the bench.

Small stringers of barite up to 0.5 metres long intrude the country rock within 3 metres of the footwall of the main lode.

The barite lode terminates abruptly at the northern end adjacent to the north-western corner post although abundant spoil from the bench obscures much of the outcrop. The southern limit has been mapped near Survey Station VII although sparse barite float extends down hill for a further 20 metres.

Overall strike of the lode has been calculated geometrically as 170° with an average dip of 34° to the west. In the bench face, the dip of the footwall of the lode varies from 30° to 35° whereas the hanging wall dips at 40° (see plate 10332).

The attached cross sections are diagrammatic only, using an average dip of 34°. The lode is expected to vary in dip and to swell and pinch down dip as in outcrop.

Projection of the lode to the 60 metre level based on the cross section indicates a variation in strike from 143° to 212°. Width of lode ranges from nil to a maximum of 1.8 metres in cross section D-D'. Weighted mean has been calculated at 1.0 metres for continuous lode and 0.7 metres based on the trace of lodes.

Extension of the lode below the 60 metres level is unknown. Length may either increase or decrease as the lode is expected to be lenticular vertically as well as in plan.

Slide 10332

Plate 10332 Mt. Falkland Barite Deposits, No. 3 Lode

Slightly contorted white barite lode is exposed in southern face of bench. Dip approximates 30° -40° to the south and width of 1 metre.

The barite has formed along a brecciated zone aligned with the bedding of the enclosing strata. In the bench face, the footwall of the lode is marked by several cms of friable schist underlain by one metre of brecciated and partly silicified country rock. In the compressor cutting, a one metre wide zone of brecciated country rock contains no barite. Strike of this structure is 170° with a 43° dip to the west.

However, in the middle of the track 7 metres west of the compressor, small pods of barite were observed in this zone.

Three lenses of barite, 1-2 metres long and 0.5-1.0 metres wide, probably extensions of the main barite lode, crop out in a prominent ledge of quartzite about 70 metres south of the south-western corner post. The southernmost of these lenses lies along a strong fault which has crumpled and contorted the otherwise gently dipping beds of quartzite. The other two lenses are conformable with the country rock.

QUALITY OF BARITE

Samples submitted for laboratory testing are described in Table 2, and locations are shown on plan no. 74-995.

Table 2

Description of Barite Samples, Mt. Falkland No. 3 Lode

Sample No.	Description
A 118/74	Hand picked high quality barite from bench adjacent to Survey Station II.
A 119/74	Brecciated barite rich in geothite (iron oxide).
A 120/74	Chip sample across barite lode, 1 metre wide, exposed in pit face.
A 332/74	Grab sample from small stockpile of barite at camp.
A 339/74	High Quality colourless to white and very pale grey barite, coarsely crystalline. Selected sample from face below bench.

The barite is coarsely crystalline, white and massive with patchy red and brown staining on crystal faces. Fracturing is common and in extreme cases, particularly along the footwall, dark brown goethite has penetrated cracks and pores. Sample no. A 119/74 representing an extreme sample assayed 4.6% Fe_2O_3.

Well crystallized specimens of botryoidal goethite are obtained from the footwall of the barite lode particularly immediately west of the bench.

The test results are summarised in Table 3 from the data presented in the Appendix.

Table 3

Summary of Test Results

		Chemical Analysis (%)			
Sample No.	S.G.	$BaSO_4$	$BaSO_4+SrSO_4$	SiO_2	Fe_2O_3
A 118/74	4.38	96.0	99.3	0.15	0.0035
A 119/74	4.37	88.9	91.3	0.35	4.6
A 120/74	4.44	96.7	99.5	0.1	0.03
A 332/74	4.43	96.3	99.6	0.06	0.03
A 339/74	4.43	96.5	99.6	0.07	0.03

Soluble alkaline earth materials expressed as calcium for all samples are less than the limit of 250 ppm as required by the American Petroleum Institute Standard 13A (see Appendix). Specific gravity exceeds 4.20 minimum and hence all samples are suitable for oil well drilling fluid materials.

Samples no. A 118/74, A 120/74, A 332/74 and A 339/74 represent very pur sulphate mineral with total barium and strontium sulphate content in excess of 99.3%. These four samples fulfill specifications for use in pigments as defined in American Society for Testing Materials Specification D602-42 which required barite to be white and contain -

at least 94% $BaSO_4$

not more than 0.05% Fe_2O_3

not more than 0.2% soluble salts

not more than 0.5% moisture and volatiles

not more than 2% quartz, clay and foreign material.

RESERVES

The potential yield in tonnes per vertical metre from the outcrops of barite as listed in Table 4 have been calculated assuming a specific gravity of 4.4.

Table 4

Expected Yield of Barite per Vertical Metre

Outcrop	Area (sq. metres)	Yield (tonnes/vet. metre)
Northern, above bench	96	420
Northern, below bench	53	230
Eastern	60	260
Southern, Station VI		
outcrop	60	260
scree	50	220
Southern, Station VII		
outcrop	12	50
scree	53	230
TOTAL	384	1 670

Simple gouging to an overall depth of two metres should, therefore, yield a maximum of 3 300 tonnes.

Geological reserves of barite have been calculated from the outlines on cross-sections A-A' to H-H'. The figures listed in Table 5 are classified as inferred barite due to the lack of subsurface data.

The terms used in Table 5 are defined as follows:

Potential - The lode is assumed to persist down dip with a consistent width.

Expected - The lode is assumed to pinch and swell down dip as in outcrop. Calculated tonnage is reduced by a factor of 65% above the 80 metre level and 70% above the 60 metre level. These factors represent the proportion of outcrop in the projected trace outlines shown on plan.

Table 5

Geological Reserves of Barite, No. 3 Lode

Classification	Level	Volume (c. metres)	Tonnes Potential	Tonnes Expected
Inferred	80 m	1 600	7 000	4 500
Inferred	60 m	2 300	10 000	7 000
	TOTAL	3 900	17 000	11 500

Open cutting will enable extraction of all barite whereas underground operations will require the retention of some of the lode for support.

The dip of the barite lode, subject to confirmation by subsurface exploration, is too low to allow the safe extraction of an adequate proportion of the resource by underground methods (R.E. Mathews, pers. comm).

The quantities of overburden (Table 6) to be removed during open cut operations have been calculated from the areas outlined on the cross section based on benches 5 metres wide and faces 7.5 metres high with a slope of 75°. A specific gravity of 2.5 has been assumed for country rock. Actual overburden will depend on variations in the dip of the barite lode.

Table 6

Inferred Overburden, No. 3 Lode

Level	Area (sq. metres)	Volume (c. metres)	Tonnes
80 m	1 500	4 000	10 000
60 m	2 600	18 000	45 000
TOTAL	4 100	22 000	55 000

The ratio of barite to overburden is summarised in Table 7.

Table 7

Barite to Overburden Ratios, No. 3 Lode

(1) By Volume	Cubic Metres		
Potential Barite	Barite	Overburden	Ratio
80 m	1 600	4 000	1:2.5
60 m	2 300	18 000	1:7.8
TOTAL	3 900	22 000	1:5.6
Expected Barite			
80 m	1 000	4 600	1:4.6
60 m	1 600	18 700	1:11.7
TOTAL	3 200	23 300	1:9.0

(2) By Weight	Tonnes		
Potential Barite	Barite	Overburden	Ratio
80 m	7 000	10 000	1:1.4
60 m	10 000	45 000	1:4.5
TOTAL	17 000	55 000	1:3.2
Expected Barite			
80 m	4 500	11 400	1:2.5
60 m	7 000	46 800	1:6.7
TOTAL	11 500	58 200	1:5.1

EXPLORATION PROGRAMME

The quantity and quality of subsurface barite and the amount of overburden should be confirmed either by drilling from the surface or by underground development on lode.

Drilling

(a) Vertical holes, using an air powered rock drill with extension steels or a rotary drilling rig. A 10 hole programme of 101 metres is proposed (Table 8) from sites shown on plan no. 74-995 with targets as shown on the geological sections. Samples from the barite intersections should be collected at one metre intervals for laboratory testing.

Table 8

Proposed Vertical Drill Holes

Target	Drill Hole No.	Depth (metres)	Cross Section
above 80 m level	1	6	B-B'
	2	8	C-C'
	3	10	D-D'
	4	5	E-E'
above 60 m level	5	12	B-B'
	6	15	C-C'
	7	17	D-D'
	8	12	E-E'
	9	10	F-F'
	10	6	G-G'
	TOTAL 10	101	

(b) Inclined Diamond Core Holes. Testing can also be accomplished by a programme of 84 metres in 10 holes from the same sites as above using a diamond drilling rig. All holes are inclined at 60° as shown on the cross-sections. Core from the barite lode should be split and submitted for assay based on variations in colour and goethite content.

Table 9

Proposed Diamond Core Holes

Target	Drill hole No.	Depth (metres)	Cross Section
above 80 m level	1	5	B-B'
	2	7	C-C'
	3	8	D-D'
	4	4	E-E'
above 60 m level	5	10	B-B'
	6	13	C-C'
	7	14	D-D'
	8	10	E-E'
	9	8	F-F'
	10	5	G-G'
	TOTAL 10	84	

Should results of the initial programme indicate persistence or widening of the barite lode with depth, a second stage of drilling below the 60 metre level is warranted.

Underground Development

Underground development along the lode will provide a continuous record of the behaviour of the barite lode in contrast to the intersections obtained by drilling. As well, a quantity of ore will be mined to offset costs.

Adits are proposed at two levels -

- a lower adit on the 60 metres level with a portal near Survey Station VII.

- an upper adit on the 80 metres level either driven southwards from the bench or with a portal near Survey Station VI. Rising, up dip from the lower level on cross section D-D' to surface would also provide valuable information but may be difficult to complete due to the low dip of 34° of the lode.

Distances and estimated costs based on $120 per metre of advance are tabulated in Table 10.

Table 10

Proposed Underground Development

	Driving		Rising (Doubtful)	
Level	metres	cost	metres	cost
80 m	60	$7 200	30	$3 600
60 m	80	9 600	35	4 200
TOTAL	140	$16 800	65	$7 800

Should the lower adit encounter barite of mineable width, then testing below this level could be accomplished by driving a third adit on the 40 metre level from the bend in the track near the south western corner directed north easterly into the hill.

An estimated 1 600 tonnes of barite may be obtained from the two exploratory adits with drives 2 metres by 2 metres and yields of 65% and 70% respectively for the upper and lower adits.

CONCLUSIONS

Three lodes of barite have been mapped in the picturesque A.B.C. Range, near Mt. Falkland in the Flinders Ranges.

Although the deposits have been held since 1943, difficult access, problems in mining and transporting ore and lack of markets have restricted production to only 219 tonnes.

Construction of a vehicular access track to the No. 3 lode has enabled mining to proceed more easily than in the past. A total of 122 tonnes was produced from No. 3 lode in 1972 and 1973.

The barite has formed in fracture zones parallel to

bedding in the A.B.C. Range Quartzite, a unit of the Wilpena Group within the Adelaidean sediments of Precambrian age. The barium was probably derived from nearby siltstones of the underlying Brachina Formation.

Testing of initial samples has proved that the barite is acceptable for oil drilling purposes and that zones free of goethite are of industrial grade, suitable for use as pigments.

Gouging to a depth of 2 metres should produce 3 300 tonnes of barite.

The following tonnages of barite are inferred above the lowest point of outcrop:

	Potential	Expected
Ave. width (metres)	1.0	0.7
Above 60 m	7 000	4 500
Above 60 m	10 000	7 000
TOTAL	17 000	11 500

Open cutting will require the removal of 22 000 cubic metres of overburden from an area of 4 100 square metres.

Ratio of ore to overburden by volume is 1:5.6 for potential inferred barite and 1:9.0 for expected inferred barite.

Underground mining is not recommended as a considerable portion of the lode will need to be left as support.

Reserves of barite can be proved either by drilling or by underground development. Initial drilling programmes may comprise either 101 metres in 10 vertical holes or 84 metres in 10 inclined holes. The recommended underground exploration consists of two adits totalling 140 metres with possible follow up rising of 65 metres.

Extension of operations below 60 metre level should be preceded by deeper exploration.

Should mineable reserves of industrial grade barite be substantiated by exploration, this deposit becomes a significant mineral resource. Then the mineral lease should be granted in accord with the Flinders Ranges Planning Area Development Plan which provides for mining in Class A Environmental Areas "where mineral deposits are of paramount significance and their exploitation is in the State or National interest" in "such other localities as may from time to time be determined".

Mining should be planned so as to minimise permanent impact on the amenity.

Proper utilization of the resource necessitates open cutting. Hence, the disposal of overburden and the design of the workings should be such that visual impact is minimal. The existing native trees will screen much of the operations from the valley floor.

As the access track and bench already exist, mining of the barite is recommended to enable the site to be rehabilitated and the environmental impact reduced. The relocation of access track and camp to the eastern flank of the A.B.C. Range warrants investigation.

30.1.75
JGO:ST

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APPENDIX

TESTS ON MT. FALKLAND BARITE

extracted from AMDEL Report

MP3547/74

by

Dr. R. Davey

and from AMDEL Reports MP1108/75

and 1114/75

by

Dr. W. G. Spencer

1. PETROGRAPHY

Sample: A 118/74 B TS 31890

Location: Mt. Falkland, No. 3 Lode MC.7235

Rock Name: Barite

Hand Specimen: Massive white barite stained light brown on the surface.

Thin Section: An optical estimate of the constituents gives the following:

Barite	100%

The thin section consists largely of a single crystal of barite. This barite has been fractured and strain deformation lamellae have developed in a few places adjacent to the cracks. Such lamellae penetrate into the main crystal a distance of 0.25 - 0.75 mm. A small amount of granular barite occurs in places in the cracks.

Sample: A 119/74 C TS 31891

Location: Mt. Falkland, No. 3 Lode MC.7235

Rock Name: Barite

Hand specimen: A brecciated mixture of grey and white barite veined and cemented by dark brown geothite.

Thin Section: The thin secton contains:

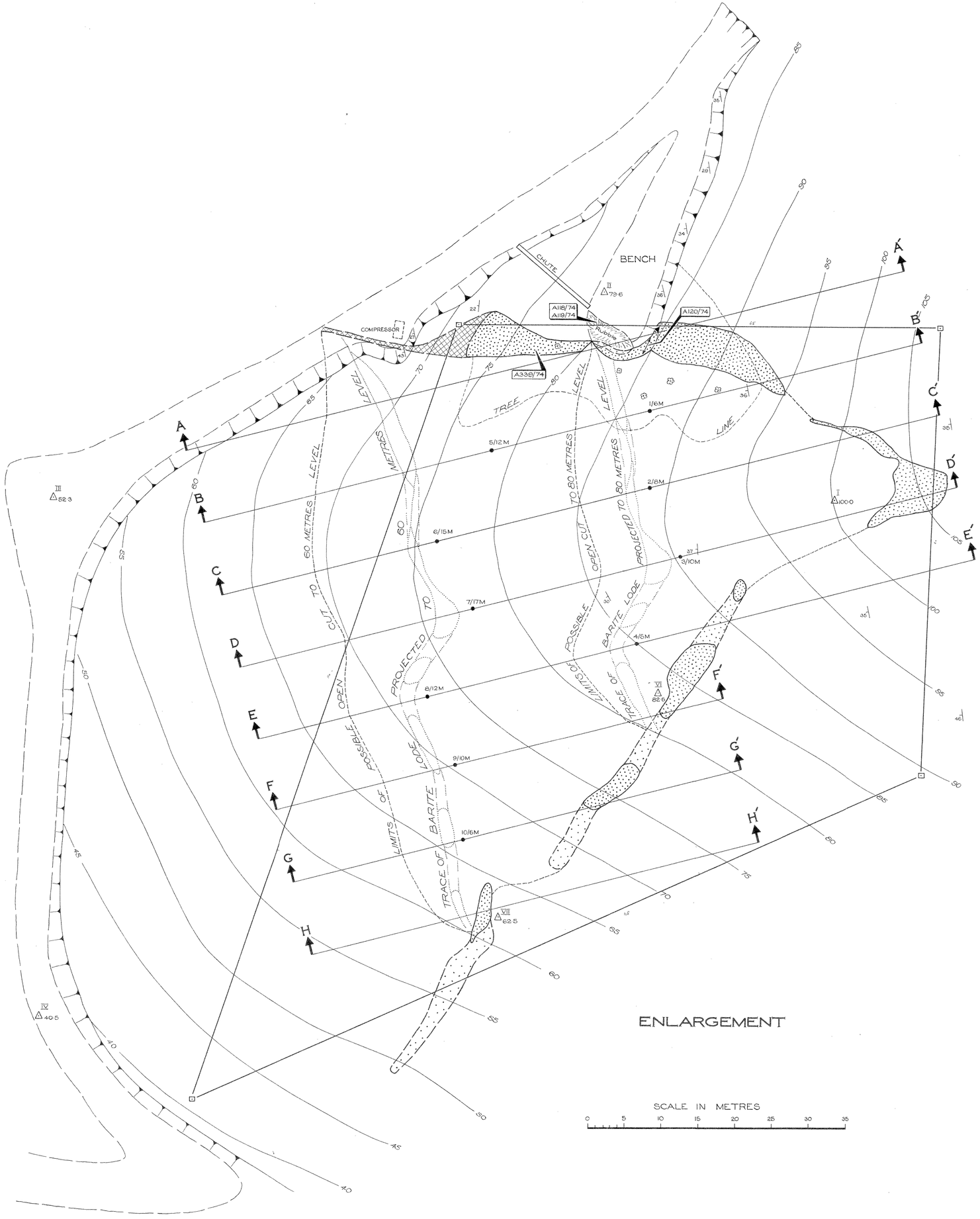
Barite
Opaques (goethite)

In this sample barite in large plates (more than 1 cm) has been fractured and geothite, in some places botryoidal, has penetrated along cracks and pores in the barite. The more massive geothite will be fairly easy to remove but the disseminated variety will be very difficult to separate from the barite because of its impregnation in the barite.

Geothite occupies 10% of the thin section but this is not necessarily representative of the rock. The smaller network veins and grains of geothite/limonite are 0.006 mm in diameter. No other minerals are present.

2. TEST RESULTS

Sample No.	A 118/74	A 119/74	A 120/74	A 332/74	A 339/74
Specific Gravity	4.38	4.37	4.44	4.43	4.43
Reflectance					
457 nm	-	-	-	79.0	78.7
570 nm	-	-	-	85.4	88.7
Yellowness	-	-	-	6.4	10.0
Chemical Content (%)					
$BaSO_4$	96.0	88.9	96.7	96.3	96.5
$SrSO_4$	3.3	2.4	2.8	3.31	3.14
Fe_2O_3	0.035	4.6	0.03	0.03	0.03
SiO_2	0.15	0.35	0.1	0.06	0.07
Al_2O_3	0.22	0.08	0.08	0.03	0.03
Ig. Loss	0.24	1.36	0.32	0.07	0.18
Total	99.9	97.7	99.9	99.8	99.9
Sol. Alk. earths as Ca (ppm)	20	17	14	15	15



ENLARGEMENT

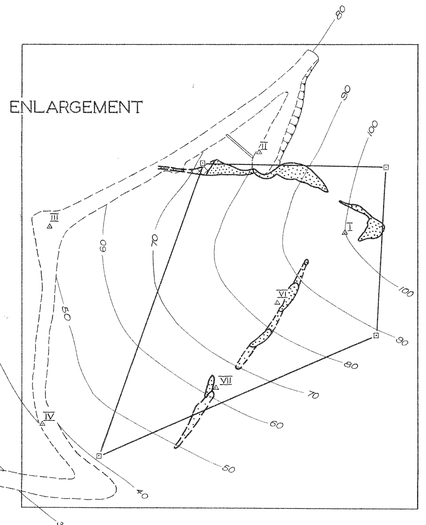
SCALE IN METRES

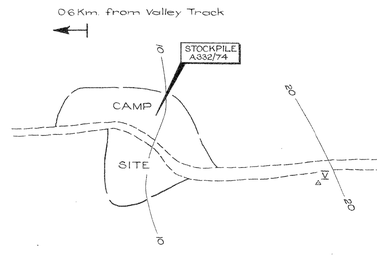
0 5 10 15 20 25 30 35

N

MAGNETIC NORTH

SEE ENLARGEMENT





SCALE IN METRES

0 20 40 60 80 100

LEGEND

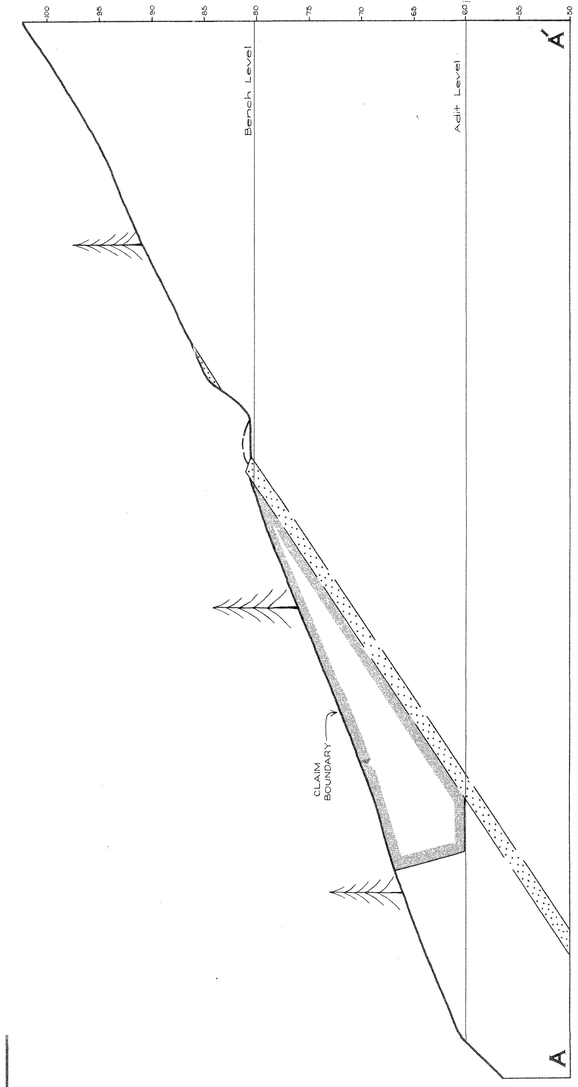
- Barite outcrop.
- Barite scree.
- Quartzite, Sandstone and minor schist.
- Fault zone.
- 36 Strike and dip of bedding.
- 95 Contours in metres. Assumed datum Station I = 100.00 metres.
- V 19.4 Survey Station. No. R.L.
- Pit face.
- Claim corner post.
- A120/70 Sample location.
- Track.
- 2/10 M Proposed drill hole. No/ Depth.
- Tree.
- GEOLOGICAL SECTIONS See plan nos. 74-996 & 74-996/A.

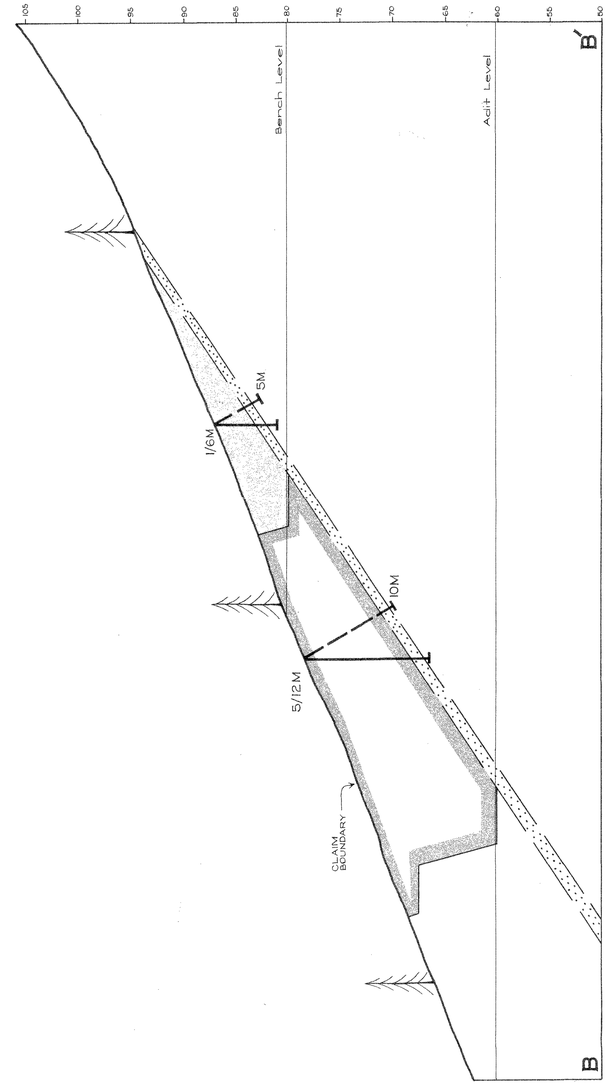
STADIA SURVEY by R.J. Harris S.F.B. 165, 166.

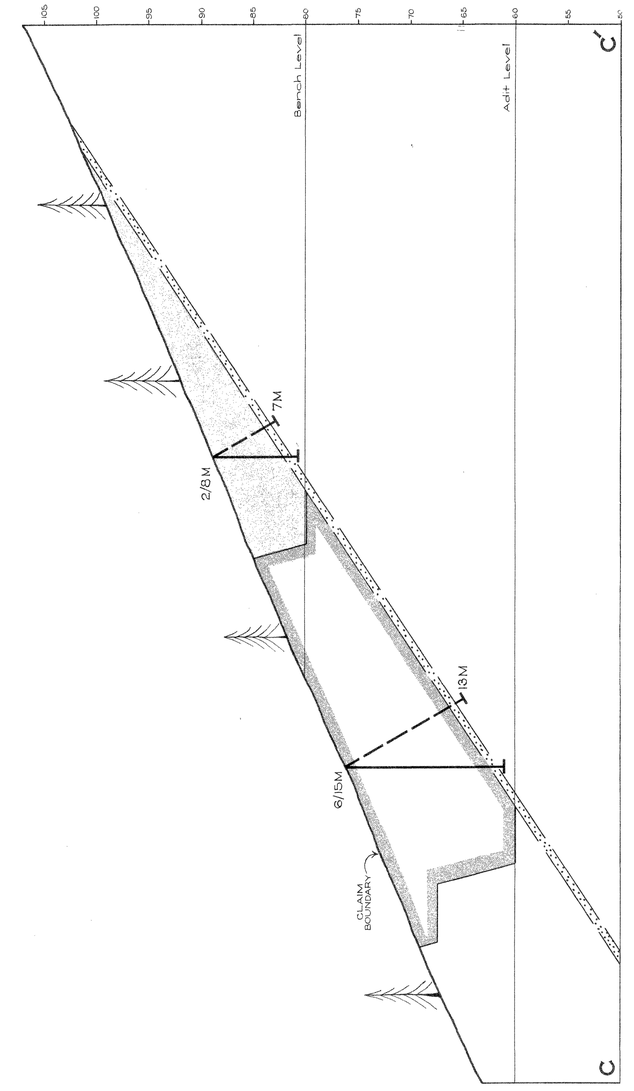
DEPARTMENT OF MINES — SOUTH AUSTRALIA

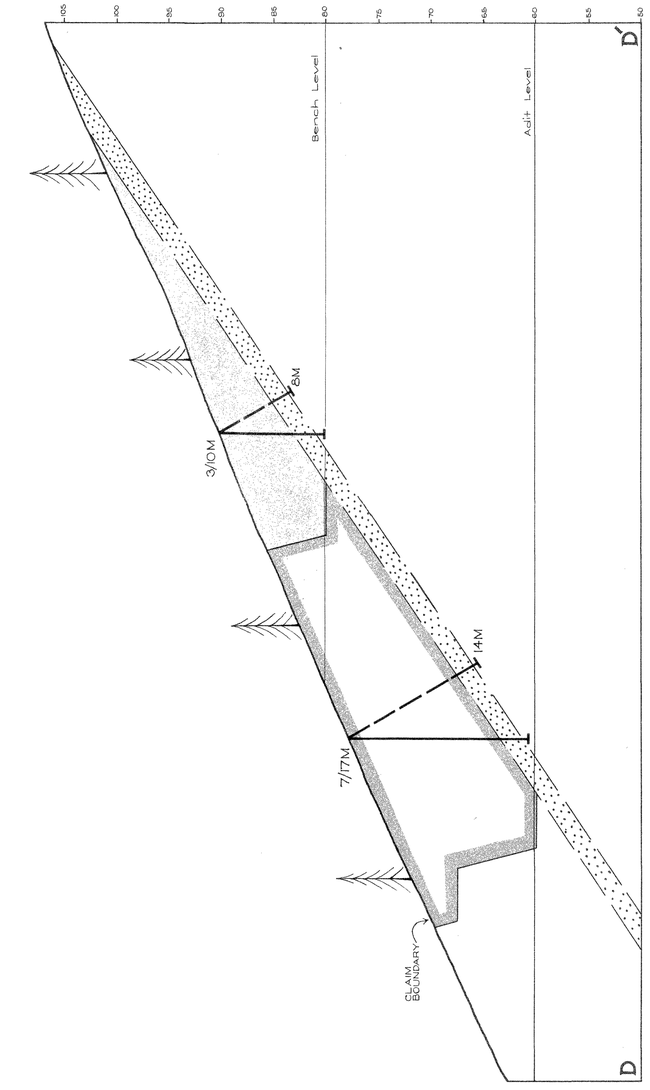
MT FALKLAND BARITE DEPOSITS NO. 3 LODE
MC 7235 R.C. BAIRSTOW
GEOLOGICAL PLAN

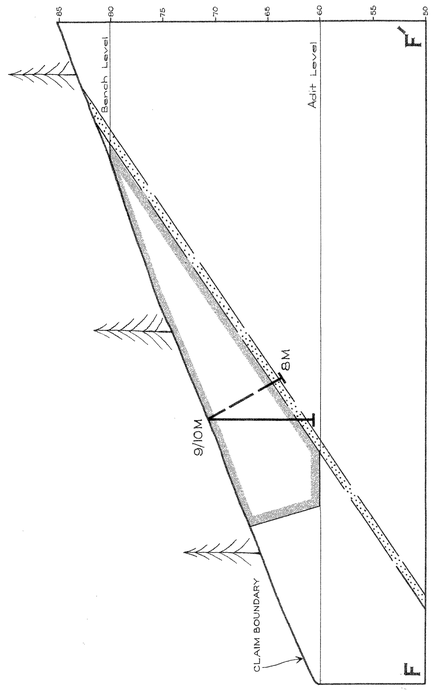
INDUSTRIAL MINERALS SECTION	J.G. OLLIVER SEN. GEOLOGIST	Compiled J.G.O.	Scale: 1:250 & 1:1000
			Date: 18th Nov. 1974.
Director of Mines		Dtn. J.M.W.	Drg. No. 74-995 Fo2
		Ckd. A.F.	

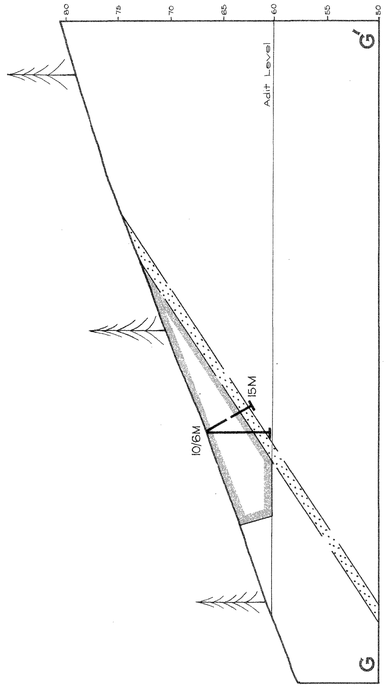


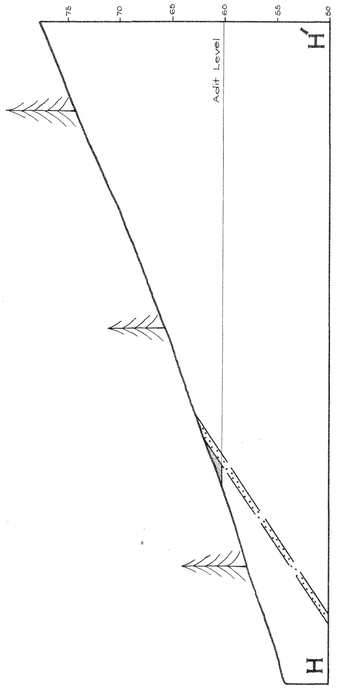












LEGEND

Barite lode.

Overburden — above 80m.

Overburden — above 60m.

7/17M — PROPOSED DRILL HOLE.
Vertical — No./Depth in metres.
Inclined — Depth in metres.
14M

Elevations are in metres.

SCALE IN METRES

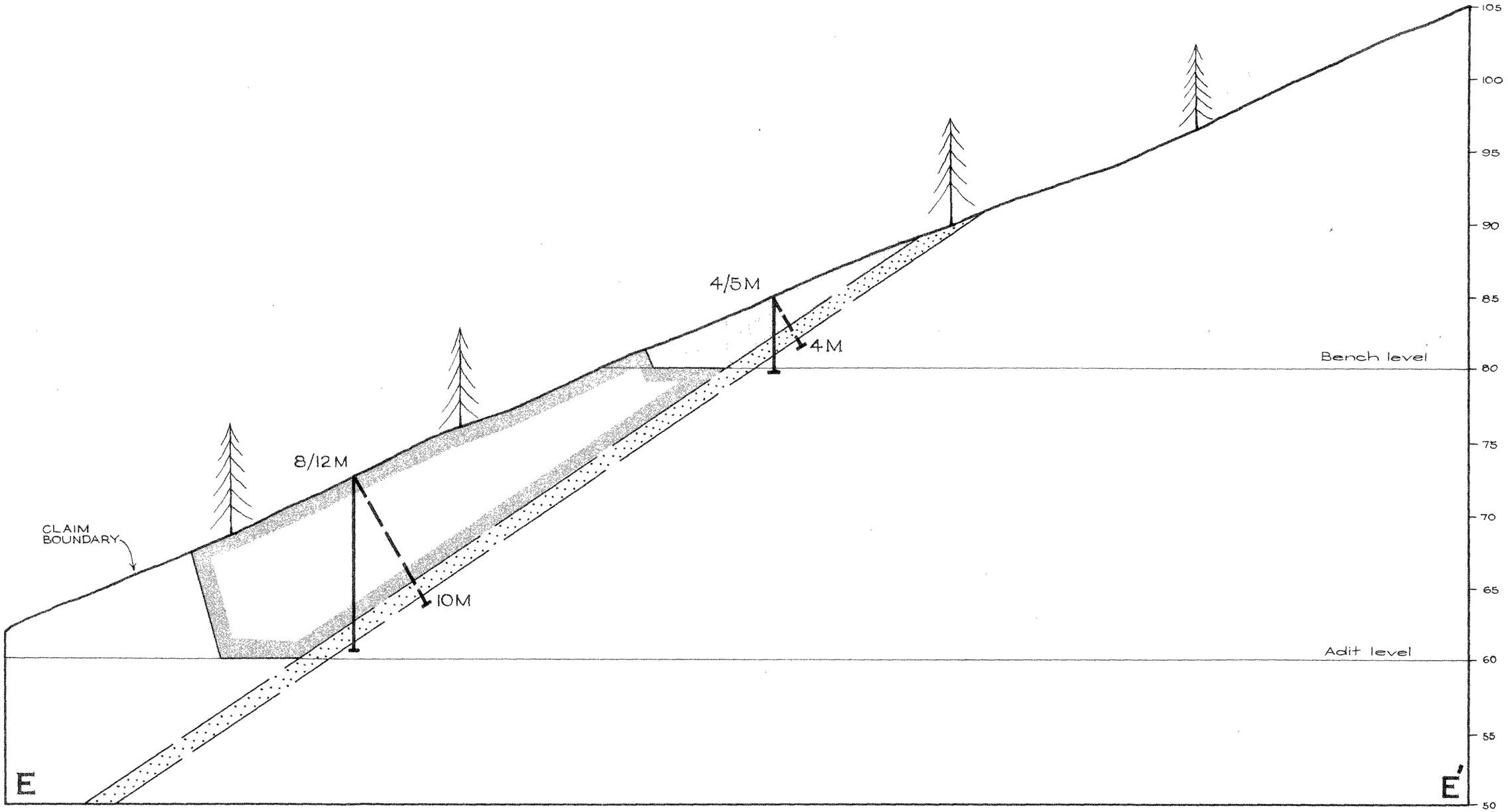
0 5 10 15 20 25 30 35

DEPARTMENT OF MINES — SOUTH AUSTRALIA

MT FALKLAND BARITE DEPOSITS NO. 3 LODE
MC 7235 R.C. BAIRSTOW
GEOLOGICAL SECTIONS

INDUSTRIAL MINERALS SECTION	J. C. OLLIVER SENIOR GEOLOGIST	Compiled J.G.O.	Scale: 1:250
		Drn. J.M.W.	Date: 26th Nov. 1974
Director of Mines		Ckd. A.P.	Drg. No. 74-996 Fa2

509-4/72 61661



DEPARTMENT OF MINES — SOUTH AUSTRALIA

MT FALKLAND BARITE DEPOSITS NO. 3 LODE
MC 7235 R.C. BAIRSTOW
GEOLOGICAL SECTIONS

INDUSTRIAL MINERALS SECTION	J.G. OLLIVER SENIOR GEOLOGIST	Drn. J.G.O	SCALE : 1 : 250
		Tcd. J.M.W.	74-996/A Fa2
Director of Mines		Ckd.	
		Exd.	DATE : 26th Nov. 1974