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TENEMENT: NOT RELATED

TENEMENT HOLDER: GEOLOGICAL INVESTIGATIONS TALC GUMERACHA AREA

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TALC ON MINERAL CLAIMS 2485 AND 2486

NEAR GUMERACHA, S.A.

Report

to

Industrial Rock Mines Pty.Ltd.

by

E.K. Sturmfels, D.Sc.,
Consulting Geologist

With 2 Plates

Diamond Creek, Vic. 20th September, 1960.

DEPARTMENT OF MINES
SOUTH AUSTRALIA

TALC ON MINERAL CLAIMS 2485 & 2486

NEAR GUMERACHA, S.A.

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Plate 1 : Sketch Map, Talc Deposits on MC 2485 and MC 2486, with Locality Sketch.

Plate 2 : Geological Map, Talc Deposits on MC 2486.

SUMMARY

Talc occurs on MC 2485 and MC 2486 in a number of separate irregularly shaped areas. The talc contains albite in varying proportions, and albite also occurs as separate rocks within and adjoining the talc deposits. The albite content can vary within wide limits, but talc completely free of albite cannot be expected. It appears that the location of talc deposits is determined by the presence of beds with an originally high magnesium content and zones of intense movement. The deposits have been worked on a small scale from small shafts and open cuts since 1929. Talc on the surface is generally of third grade because of the widespread iron-oxide staining and the inclusions of decomposed dark minerals. A large proportion of the underground material can be expected to be of higher grade. To re-open some of the old underground workings would probably be the quickest way to obtain first-hand information on the composition of the deposits at depth. Exploratory work to trace the lateral extent of the talc could include removal of overburden, trenching, excavating with a bulldozer and drilling. Only the lowest grade of talc could be obtained from an open cut. An adit or tunnel would reduce the cost of mining as compared to shafts and also provide good drainage. The steep slope on MC 2486, to the north-east of

Pearce's open cut, seems to offer the best prospects : there is a reasonable chance that talc is present in the 300 ft. interval between the known talc outcrops. A second place where some exploratory work is warranted is the talc deposit on the ridge towards the north-eastern corner of MC2485, which could be quite extensive. The third place would be the area on MC2486 between the old shafts and Pearce's open cut.

INTRODUCTION

Talc deposits on Mineral Claims 2485 and 2486 near Gumeracha, S.A., were purchased recently from Mr. E.O.Pearce and transferred to the Company. The writer was asked to inspect the deposits and make a preliminary evaluation on which an exploration program could be based.

The writer was shown over the deposits by Mr.G.G.MacGregor on 15th August. Preliminary investigations on both claims and a rapid survey of MC 2486 were carried out on 16th, 17th and on the morning of 18th August. The prospects were discussed in some detail with Mr. W.M.Sharpe who joined the writer on 17th August.

LOCATION AND ACCESS

The deposits are situated half-way between Gumeracha and Birdwood and between ¼ mile and ⅝ mile south of the main highway. MC 2485 comprises 32 acres on parts of Section 44 and 245, and MC2486, 31 acres on Section 6268, all in the Hundred of Talunga. Both claims are on private land, the property of the two Amer brothers. It is hilly country. The steeper ridges where most of the talc deposits outcrop are largely covered by scrub. Cleared portions are used for grazing. The new water supply line from the Murray River to Adelaide passes in an east-westerly direction near the southern boundary of MC 2485, but since all the known talc occurrences are some distance away from it, it is not expected to be much of a hindrance for exploitation.

The distance to Rosewater by road is between 27 and 28 miles, for between ½ mile and 1 mile on tracks which in their present state would not be passable for heavy motor traffic during wet periods, and the remainder on a sealed highway.

TALC DEPOSITS

Generally the talc is visible only in workings and where the natural ove burden has been removed. Because of its comparatively soft character, the talc is normally covered by soil, rubble or scree and natural outcrops are few and far between. It would therefore be wrong to deduct from a lack of outcrops necessarily a lack of workable talc. On the contrary, the talc deposits are almost certain to extend far beyond the present exposures. On the other hand, and this applies in particular to MC 2485, talc boulders derived from old prospecting pits or trenches might cover areas much larger than the actual deposit.

On Mc 2486, talc is visible in three separate areas: The most southerly area comprises the two old open cuts and several old shafts. The surroundings of Pearce's new open cut and a nearby adit form the second area. Still further to the north, and on the foot of the slope and some 100 ft. further down is another outcrop of talc in a small cutting. These three talc areas might, or might not, be connected below the cover of scree and overburden. Outcrops of albite rock between the old shafts and Pearce's open cut could indicate that the talc is pinching out. The steep slope between the latter and the small cutting at the bottom, on the other hand, is completely concealed by quartzite rubble and there is a reasonable chance of a continuous workable deposit.

On MC 2485, scattered boulders of talc are spread over a wide area, but as already indicated above this does not necessarily mean that the whole area is underlain by talc. Solid talc is well exposed in a small open cut and in a nearby shaft, somewhat higher on the same slope. Further to the south-east, talc has been encountered in a small test pit. A number of bores put down by Mr. Pearce to an average depth of about 15 ft. apparently proved a deposit with a width of 15 or 20 ft. across the strike.

The above deposit which appears to be of some size extends from the eastern half of MC 2485 (Section 44) westwards beyond

the fence for some distance into Section 245. The extent of two or three smaller talc areas on the recently cleared slopes further to the west and south-west can be traced comparatively easily thanks to the work done by the bulldozers, but none of these areas is likely to be of major importance.

The talc deposits can be likened to a string of squeezed and rather battered sausages. Talc deposits of workable dimensions are apparently connected by thin, irregular veins of talc or lines of albite rocks.

GEOLOGICAL SETTING

The talc of the Gumeracha area contains generally albite (sodium felspar) as a constituent in varying proportions. Albite also occurs in the form of separate albite rocks, as sheaths along the margins or boulders within the talc deposits. These albite rocks are genetically connected with the talc deposits as will be discussed below, and their outcrops might give some indication as to the location of talc-bearing rocks. The albite rocks along the margins of the talc seams can show clean-cut boundaries (as for instance on the south wall of the open cut in the south-west corner of MC 2486) or they can grade into talc rock (for instance in the adit adjoining Pearce's open cut near the centre of MC 2486).

The country rock consists of biotite-quartzite schists and, less common though more obvious, quartzites. In the vicinity of the talc deposits, both rock types have been decomposed and much of their mineral content has been changed into albite ("albitization"). What has the appearance of a highly friable sandstone (well exposed in the open cut near the south-western corner of MC 2486) apparently consists of predominant albite with minor mica and talc and is probably an altered and albitized biotite schist (1).

The close association of talc and albite indicates that both minerals owe their existence to the same process, apparently a metasomatic process which increased the relative

contents of both sodium and magnesium, whilst other ions, in particular iron, were removed. Stillwell and Edwards (2) think that the sodium was introduced from outside, but that most or all of the magnesium was already present in the rocks prior to the formation of talc, mainly in the mineral biotite, and was concentrated by the removal of other constituents and the corresponding reduction in volume. The constituents which were going to form albite (soda, alumina and silica) were partly precipitated within the talc, and were partly carried away into separate albite rocks. The albite content of the talc deposits can therefore vary within wide limits, but talc completely free of albite and equalling Flinders talc in quality cannot be expected in the Gumeracha area, a point which is of some economic importance.

The location of talc deposits seems to be controlled by two factors, a stratigraphic one and a structural one. On one hand, the talc deposits are arranged along certain folded beds within the muscovite-biotite-schists (3), perhaps beds which originally had a particularly high biotite and therefore magnesium content - stratigraphic control. On the other hand the deposits seem to be concentrated on zones of intense movement or fracture zones - structural control. Detailed geological mapping could therefore provide some information as to the likelihood and possible extend of talc deposits even where outcrops of the talc itself are obscured.

PREVIOUS WORKINGS

The Torrens Mining Co. Ltd. has operated a number of small shafts and open cuts on Sections 245 and 6268 since 1929 (4) This Company was apparently extracting high-grade talc

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(1) Stillwell, F.L., and Edwards, A.B., 1951 : Petrology of the Gumeracha Talc Deposits. Geol.Surv.S.A. Bull.26,pp. 40-41.

(2) loc. cit., pp. 46-49

(3) Well presented for the main mining areas on the "Detailed Geological Map of the Gumeracha Talc Deposits" by S.B. Dickinson and A.W.G. Whittle. Geol.Surv.S.A.,Bull.26

(4) Dickinson, S.B.,and Whittle,A.W.G., 1951: The Gumeracha Talc Deposits. Geol. Surv.S.A. Bull. 26, p.29.

from underground workings on these two Sections for a period prior to the last war and before moving to the deposits further to the south where they are still working at present. It appears that they cameback just after the last war, opened up the two open cuts on top of the old workings and sunk the well-timbered 36 ft. shaft in the south-western corner of MC 2468. Why the deposit was abandoned again after these efforts is not known, but it was evidently not for lack of talc. Otherwise there would not have been such a prolonged fight against Mr. Pearce's claim jumping.

The underground workings on MC 2486 are not accessible at present nor are any records available, and we must therefore rely on surface ovservations and second-hand information. The old main shaft on MC 2486 was apparently situated in a place which now forms part of the northern one of the two adjoining open cuts (see Plate 2). It was apparently filled in when the open cut was excavated. Two old air shafts are still open to depths of 18 ft. and 30 ft. respectively. The available information indicates, however, that the old workings reach to a considerably greater depth, to 60 ft. or even more. Falls over old underground workings in the southern one of the two adjoining open cuts suggest the presence of talc at depth below schists on the surface. The shaft in the centre of this southern open cut is well timbered and obviously of more recent date than the others. It is still open to a depth of 36 ft., but was somewhat deeper originally. What appear to be the remnants of an old shaft are visible in the extreme south-west corner of the same open cut.

The third open cut on MC 2486, further to the north-east was enlarged from a small beginning only recently by Mr. Pearce. The bulk of the material produced was of third grade. A number of bores have been put down by him above the open cut, but drilling was unsystematic, concentrating on visible outcrops of talc. An adit, partly open and partly underground, on the other side of the open cut, exposes over a length of 40 ft. talc

On MC 2485, only one shaft of 15 ft. depth is still open. Some good talc is exposed, according to Mr.Pearce, in a 10 ft long drive towards the south-west. The entrance to other underground workings, some 200 ft. further to the north-east, apparently collapsed only recently, but talc is still visible in the walls of the open adit. Further to the south-east a number of bores put down by Mr. Pearce to an average depth of about 15 ft are reported to have proved a deposit of 15 or 20 ft width as already mentioned above. The very deep cutting with which Mr. Pearce had intended to open up this deposit at some depth below the surface was abandoned before reaching talc. An old shaft on the ridge beyond the fence, on Section 245,not far from the south-western end of this deposit, is now filled in, but is said to have produced some good talc.

Quality of Talc

The surface talc varies between albit-rich and albite-poor, but talc free of albite was not noticed. Some of the talc in the open cuts is discoloured by numerous inclusions of partly decomposed biotite or chlorite. Quite apart from any inclusions of other minerals, the bulk of the surface talc could not be classified better than third-grade because of the wide-spread iron oxide staining.

Little is known about the quality of talc at depth in the area under discussion. The production of talc from these deposits prior to the last war, at a time when there was no demand for third-grade material, proves however that a large proportion of the underground material is of very much higher quality and might contain some first-grade besides predominant second-grade. Though of course a certain proportion of third-grade or even quite unusable material must be expected even at depth, either because of excessive grit (albite) content or because of too much staining through biotite or other dark minerals.

Reserves of third-grade talc sufficient for immediate needs are exposed on MC 2486 alongside the northern one of the two adjoining open cuts.

PROGRAM OF EXPLORATION

To be of economic value a talc deposit must contain a reasonable proportion of first and second-grade material and must be of adequate size. As regards the first point, it is most likely that there is sufficient high-grade talc at depth, as pointed out above, but we have no proof. To enter two or three of the old shafts and re-open the old underground workings would probably be the quickest way to obtain first-hand information on the composition of the deposits at depth. Since, following the usual pattern, headings were probably stopped when they had struck some particularly bad material, the first impression of the old underground workings is likely to cause some disappointment and a certain amount of driving and sinking will be necessary to obtain a reliable picture.

Regarding the size and extent of the talc deposits we know very little. Exploratory work to trace the lateral extent of the talc could include removal of overburden, trenching, excavating with a bulldozer, and drilling. The following places seem to be worth particular attention:

(1) On MC 2486, the extent of talc down the slope to the north-east of Pearce's open cut. The ground between this open cut and the small cutting in talc some 100 ft. further down is completely concealed by quartzite scree and much talc could be present underneath this cover.

(2) On MC 2485, the talc deposit along the ridge leading to the north-eastern corner of the Claim. The apparent extent of this deposit as suggested by wide-spread boulders should be checked carefully.

(3) On MC 2486, the area between the old shafts to the south and Pearce's open cut to the north. Outcrops of albite rock occupy part of this area, but do not exclude the possible presence of talc.

The method of prospecting would depend on the particular locality and on personnel and equipment available. The writer regards trenching as generally the most satisfactory method. In scrub country where the soil is of little value some information can be obtained cheaply by removing the thin overburden with a scraper or bulldozer. On steeper slopes cuttings through the scree cover and parallel to the contour lines could be excavated with a bulldozer.

Where the overburden is very thick an engine-driven auger drill (e.g. a "Proline" drill) would supply rapid information. Supervision of the prospecting work should be entrusted to a person capable of understanding the problems and interpreting the results obtained.

The deposits in the area under consideration are neither sufficiently regular nor sufficiently wide to permit exploitation in open cuts of any but the lowest grade of talc. The talc can be expected to be stained for some ten or twenty feet below the surface. An adit or tunnel which would open up the deposits from a low level would reduce the costs of mining as compared to working from shafts and also provide good drainage. An adit or tunnel should be placed in such a position that it (a) opens up a maximum vertical depth of talc, and (b) can be driven in talc as far as possible. On present indications, the steep slope on Mc 2486 to the north-east of Pearce's open cut, offers the best prospects; the difference in elevation between the talc outcrops on top and the bottom of the slope is over 140 ft, and the interval without talc exposures and covered by scree is about 300 ft long. The deep cutting on Mc 2485, which has been excavated by Mr. Pearce, could be continued as a tunnel, but the vertical extent of talc would be very much smaller than in the first case, which would not only mean lower reserves but also the probability of a smaller percentage of high-grade talc.

Watch scale - photo reduction.

① W N R
② G M'D
③ G G MacG.

NOTES
TO ACCOMPANY PLANS AND SECTIONS
OF THE
BIRDWOOD TALC MINE
GUMERACHA, S.A.

013

for
Industrial Rock Mines Pty. Ltd.

by
E.K. Sturmfels, D.Sc.
Consulting Geologist

Diamond Creek,
Victoria

11th February, 1966

List of Plates

Plate 1 : Surface Plan
" 2 : Underground Workings
" 3 : Sections
" 4 : Proposed Open Cut

Introduction

Plans and sections of the Birdwood Talc Mine have been prepared, as requested, to assist in planning open cut operations following the recent major collapse in the underground workings. The plans submitted are based on various surveys of comparatively low degree of precision, the last of which were carried out in July, 1965. No information on the extent of the recent collapse has been available.

The proposed location of the new open cut as shown on Plate 4 and the arrangement of roads and culvert were first suggested to the Company's Adelaide manager, Mr. G.G. MacGregor, in May, 1965. A sketch indicating surface and underground workings, the likely extent of talc on the 920' Level, the proposed roads, etc., was sent, at his urgent request, to Mr. G.P. McDonald on 29th December last. The outline of the quarry floor on this sketch, incidentally, was the same as that shown on Plate 4, but the alignment of the roads has been slightly altered.

Plate 1

The surface plan of the Birdwood Talc Mine is based essentially on a rapid plane table survey in July last year. Information on the various types of country rock present, although of value for predicting shape and extent of the ore

body, would be of little interest for engineering purposes and has therefore been omitted.

The lease boundary, in default of more accurate information, has been drawn as a prolongation of the fence line on the eastern side of the surveyed road south of Station 987.0 ; its bearing is therefore only approximate, with a possible error up to about 1°. The approximate elevation of the assumed datum point (Station 987.0) has been obtained from a map published in Geol. Surv. S. Aust. Bulletin No. 26.

Plate 2

The plan of the underground workings is based on compass surveys. Closure obtained on the 900' Level South suggests an accuracy quite adequate for the short distances involved. Only workings which were readily accessible at the time of survey are shown. As in the case of Plate 1, information regarding the various grades of talc encountered and the different types of country rock has been omitted for the sake of convenience. However, if required, this information can be supplied.

Plate 3

The sections on Plate 3 are largely interpretations of information contained on the surface and underground plans of the mine. Only drives and workings which have been surveyed could be shown, but many more old workings are likely to cut the talc body between the surface and the 900' Level.

The bores were drilled with a wagon drill in May, 1965. On the evidence supplied by Bore 7, it may be assumed that the holes deviated either not at all or only insignificantly from the chosen angle of depression : Bore 7 struck the edge of the drive on the 900' Level, and the resulting angle was found to be within one degree of the chosen angle of depression (45°).

Plate 4

The proposed open cut has been drawn so that the area of very poor talc to the north, and the vicinity of the Main Shaft to the south, will be excluded. On the information available, it may reasonably be assumed that the bulk of the talc present, apart from the topmost layer, will be 3rd grade (according to local classification) or better.

An average batter of about 55° has been assumed for the sides of the open cut. This average includes a somewhat flatter batter for the overburden, and slightly steeper slopes in the lower part. The grade of the proposed road would vary between 1 in 9 and 1 in 10. The proposed culvert, to be effective down to the 920' Level, would need to be buried at a depth of up to 18 ft below the existing surface.

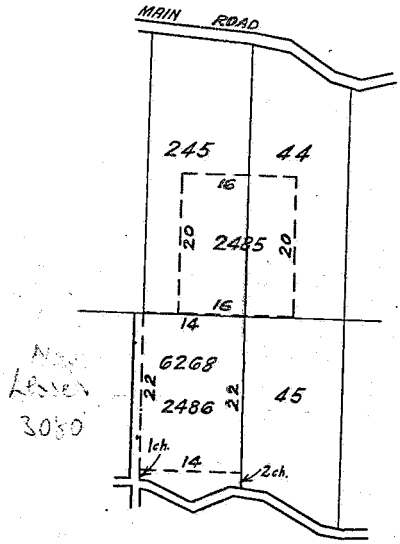
The volume of the proposed open cut, from the natural surface downwards, is 9,500 cu.yds, disregarding the excavations necessary for the access road. I estimate the

volume of existing dumps on top of the proposed cut at not more than 400 cu.yds.

As regards reserves, however, the information available does not suffice for more than a guess : we don't know how far the talc extends up-hill and how much of the material on the south-eastern side will be country rock ; we don't know how far down badly discoloured and unusable talc will extend ; we don't know how much has been removed in the old workings ; and we don't know the percentages of 2nd, 3rd and below-third grade in the remaining deposit. My guess : soil and discoloured talc overburden, 800-1,500 cu.yds, country rock, 2,000-3,500 cu.yds, old workings, 300-800 cu.yds. Of the remainder, I would expect that at least 80% are 3rd grade or better. This would leave inferred reserves of 3rd or higher grade of the order of 6,000 to 10,000 tons.

016

HD TALUNGA



Dimensions of claims shown in chains

SCALE 20 CHAINS TO 1 INCH

PLATE 1

017

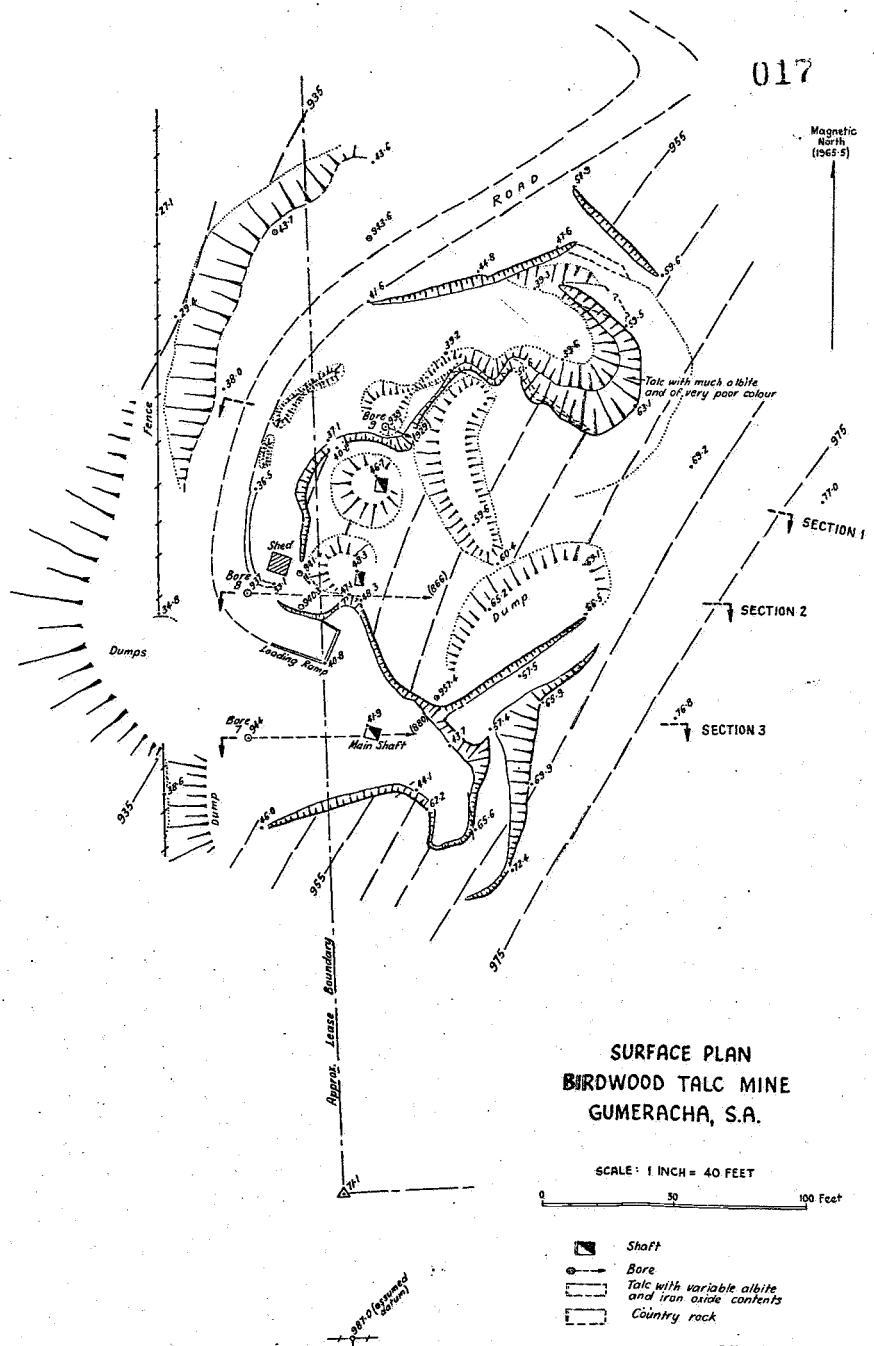
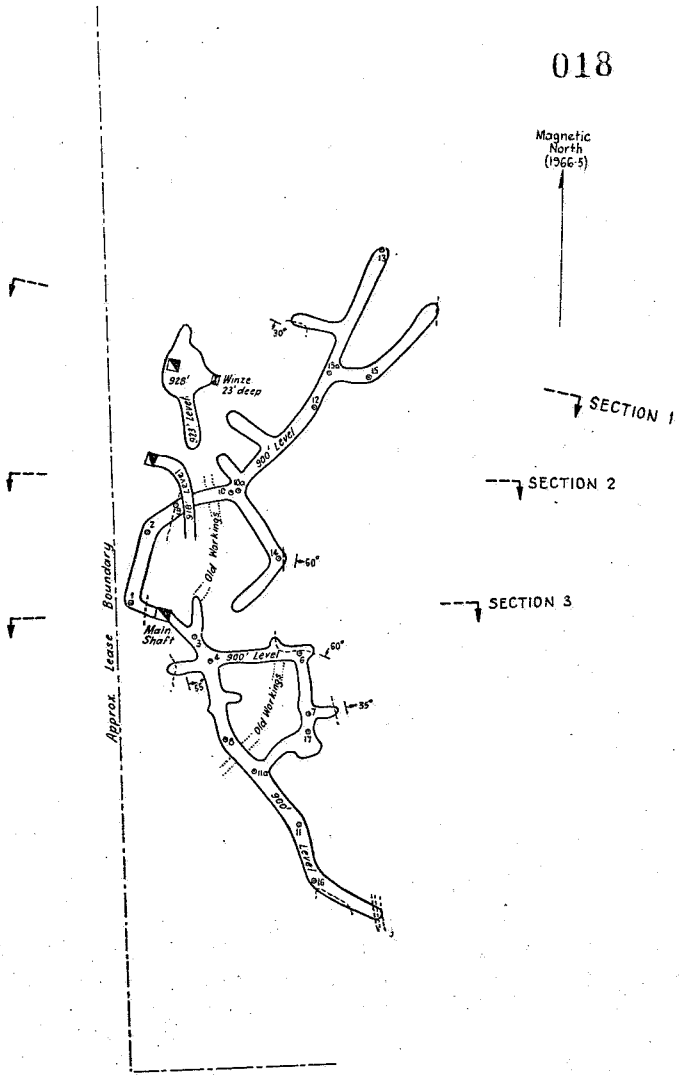

Magnetic North (1965·5)
ROAD
Fence
Talc with much albite and of very poor colour
Bore 9
Shed
Bore 8
Loading Ramp
Dumps
Dump
Bore 7
Main Shaft
Approx. Lease Boundary
SECTION 1
SECTION 2
SECTION 3
SURFACE PLAN
BIRDWOOD TALC MINE
GUMERACHA, S.A.
SCALE: 1 INCH = 40 FEET
0
50
100 Feet
Shaft
Bore
Talc with variable albite and iron oxide contents
Country rock
987·0 (assumed datum)
E.K. Sturmfels 25/7/65

PLATE 2

018



Shaft
Winze
Survey Station
Talc with variable albite and iron oxide contents
Country rock
Strike and dip of bedding

Note: Only workings accessible at the time of survey are shown.

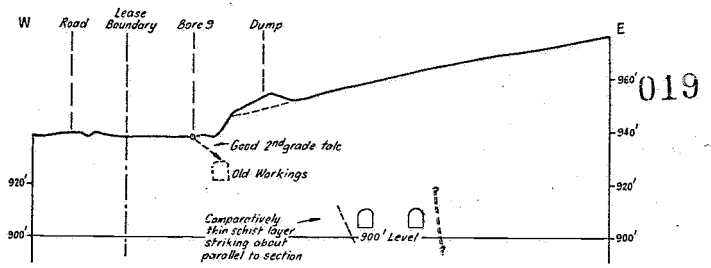
UNDERGROUND WORKINGS
BIRDWOOD TALC MINE
GUMERACHA, S.A.

SCALE: 1 INCH = 40 FEET

0 50 100 Feet

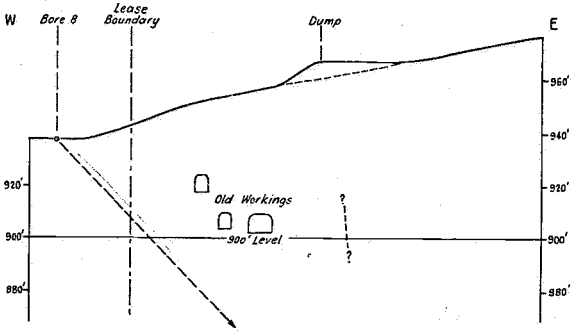
E.K. Sturmfels 24/7/65

SECTION 1

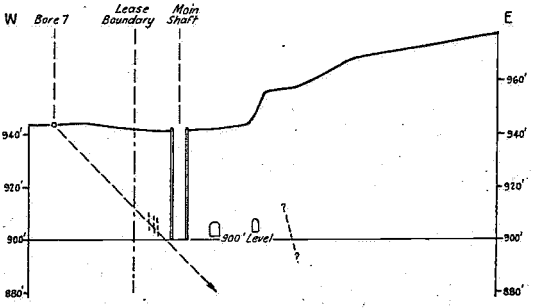


019

SECTION 2



SECTION 3



Talc (with albite and iron oxides), established or indicated

Talc (with albite and iron oxides), inferred

Country rock

Note: Only drives accessible at the time of survey are shown, but many more old workings probably exist.

SECTIONS
BIRDWOOD TALC MINE
GUMERACHA, S.A.

HORIZONTAL AND VERTICAL SCALE
1 INCH = 40 FEET

0 50 100 Feet

E.K. Sturmfels 29/1/66

020

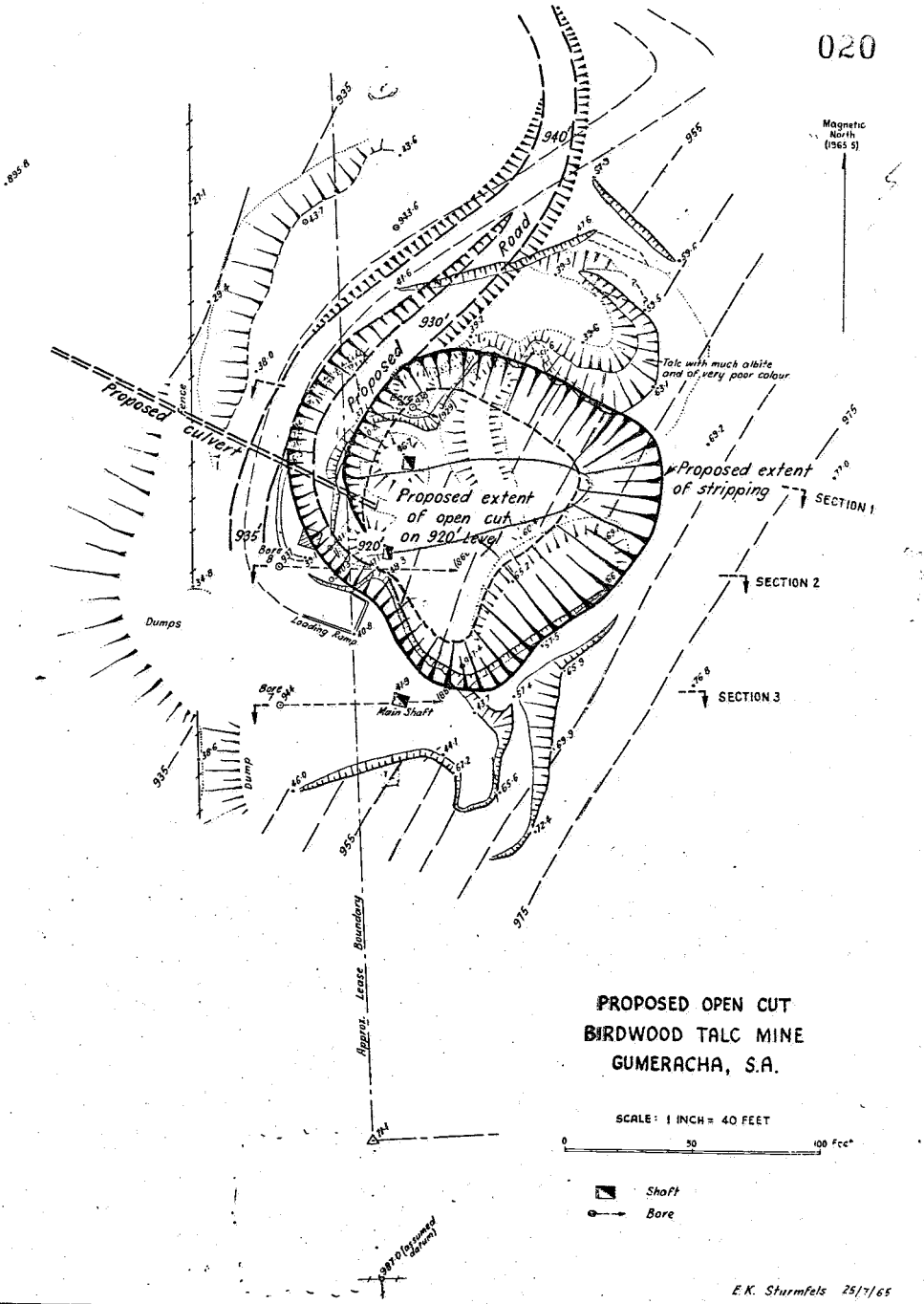
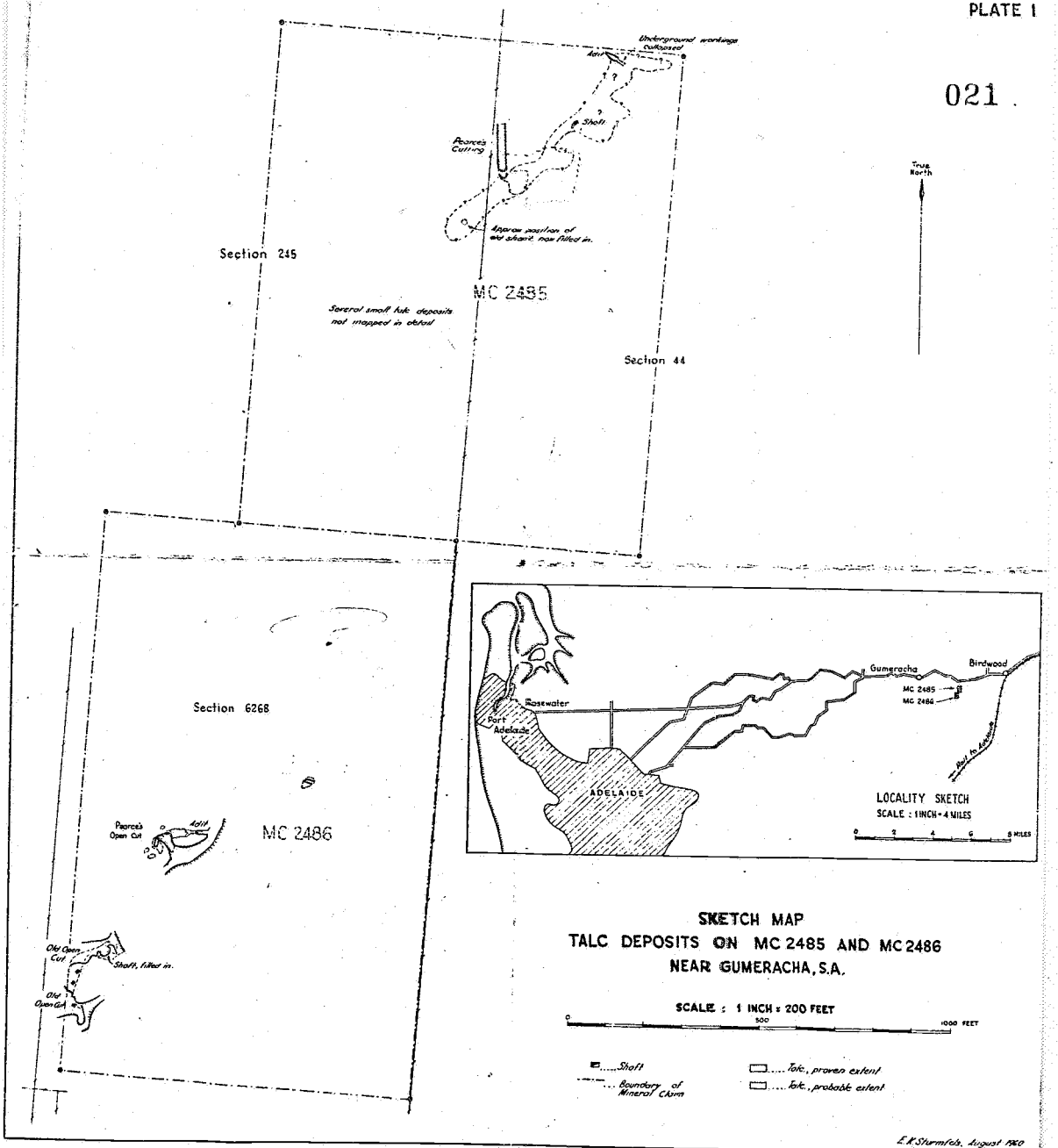

Magnetic North (1965 S)
Road
Proposed
930'
Proposed culvert
Fence
Talc with much albite and of very poor colour
Proposed extent of stripping
Proposed extent of open cut on 920' level
SECTION 1
SECTION 2
SECTION 3
935
940
955
975
920
Bore
Dumps
Loading Jump
Main Shaft
Dump
Approx. Lease Boundary
PROPOSED OPEN CUT
BIRDWOOD TALC MINE
GUMERACHA, S.A.
SCALE: 1 INCH = 40 FEET
0
50
100 Feet
Shaft
Bore
E.K. Sturmfels 25/7/65

PLATE I

021



SKETCH MAP
TALC DEPOSITS ON MC 2485 AND MC 2486
NEAR GUMERACHA, S.A.

SCALE : 1 INCH = 200 FEET

0 500 1000 FEET

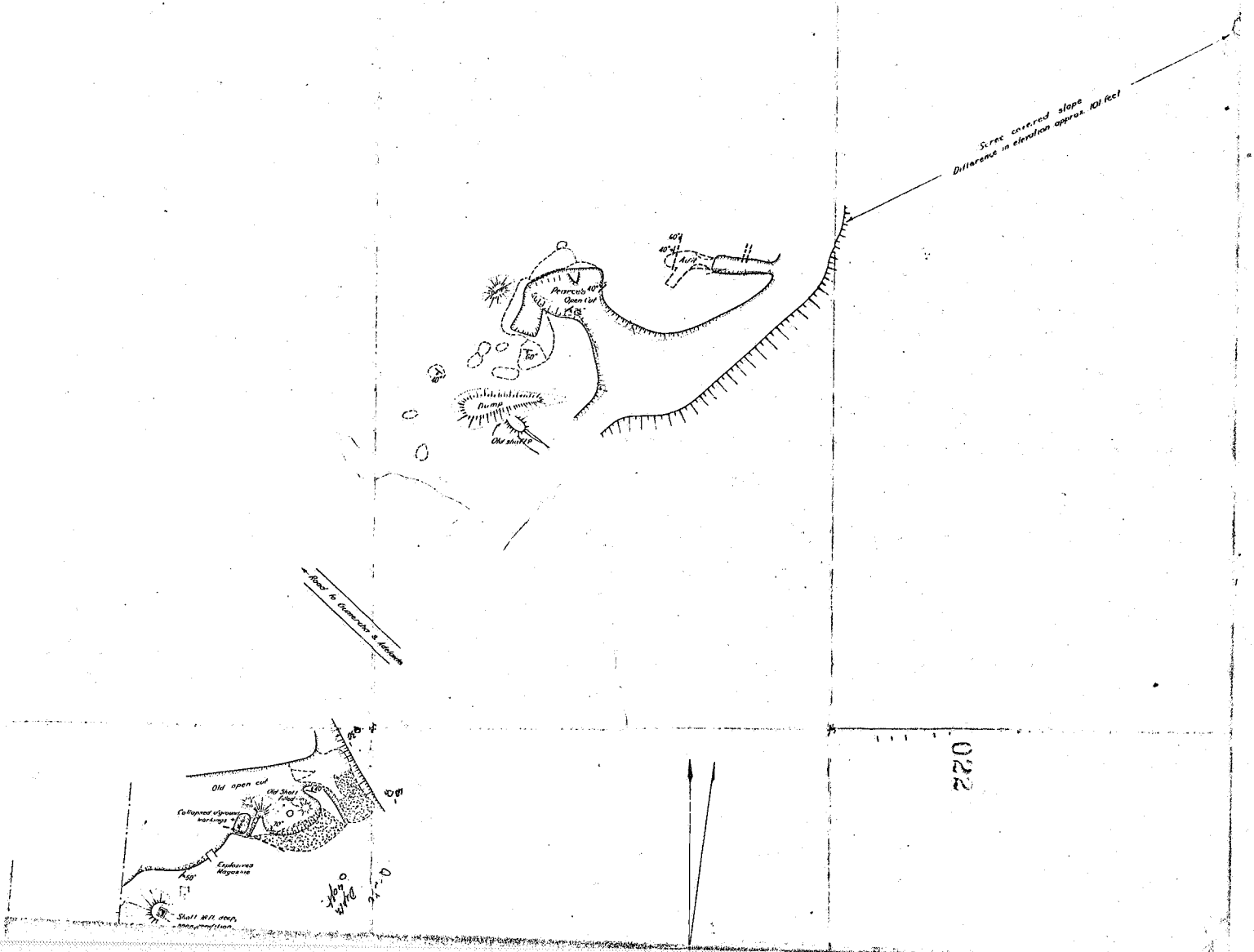
..... Shaft

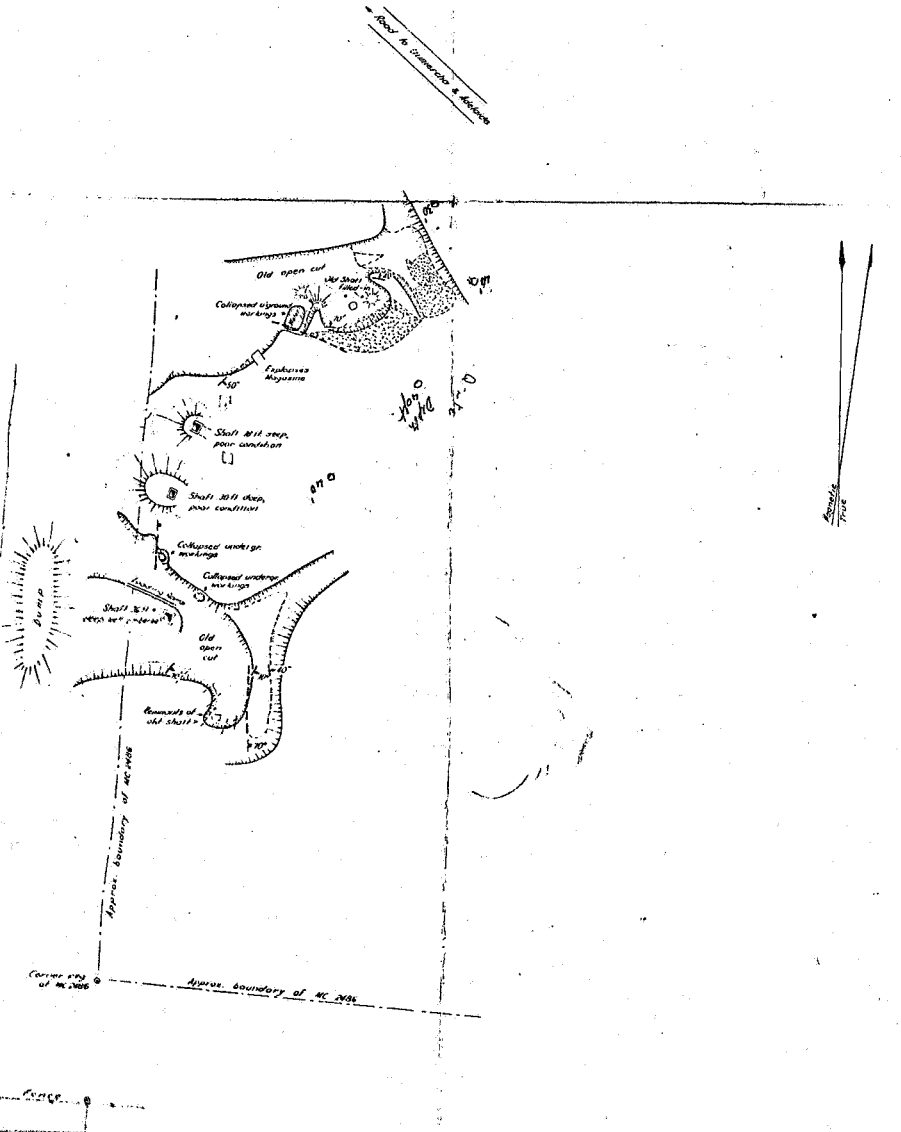
..... Boundary of Mineral Claim

..... Talc., proven extent

..... Talc., probable extent

E.A. Sturmfels, August 1960


Scree covered slope
Difference in elevation approx. 101 feet
Parcels 40
Open cut
Dump
Old shafts
Road to Quamichan & Mistaken
Old open cut
Old Shaft Filled
Collapsed adjoining workings
Explosives Magazine
Shaft 18 ft. deep, open at top
220



023

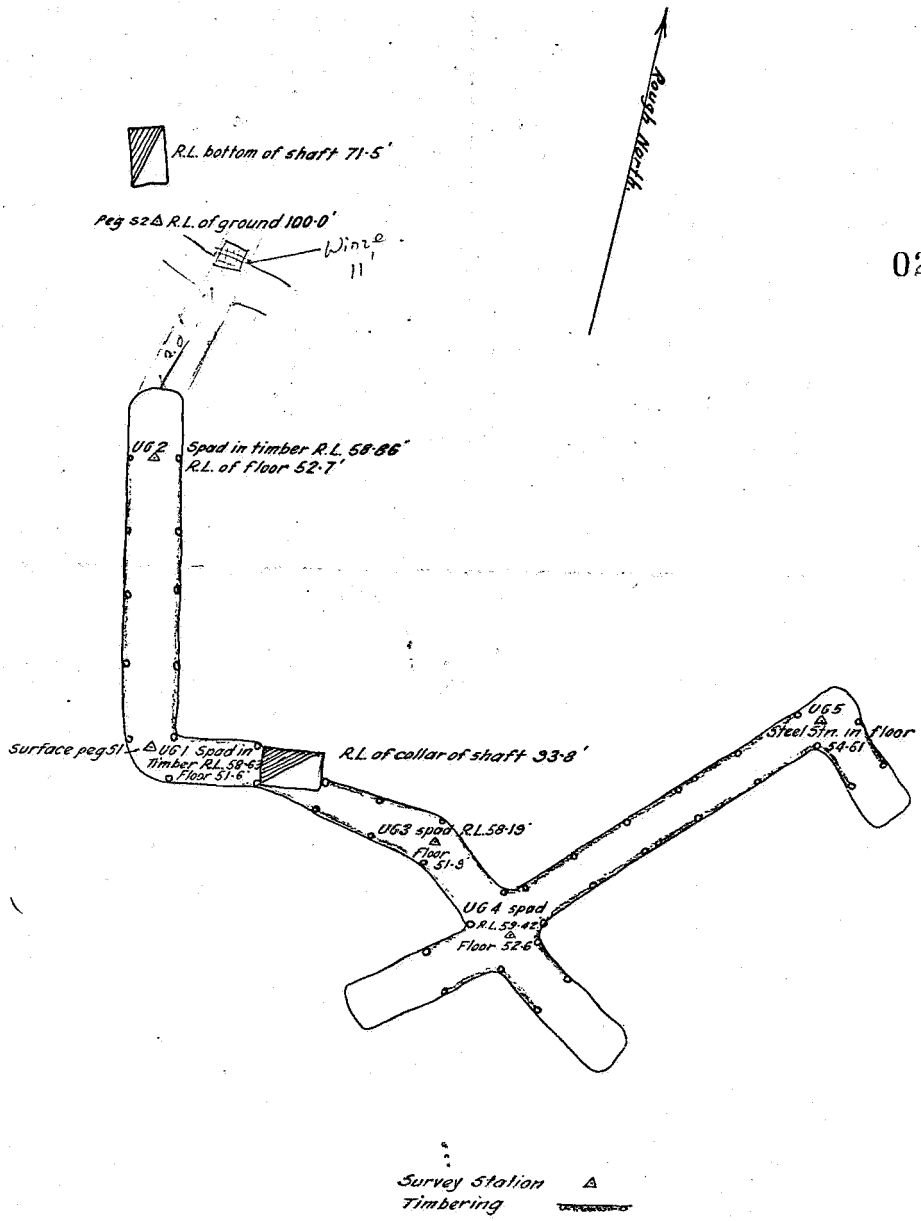
GEOLOGICAL MAP
TALC DEPOSITS ON MC 2486
NEAR GUMERACHA, S.A.

SCALE : 1 INCH = 40 FEET

0 50 100 150 200 250 FEET

- ....Shaft
- ....Fence
- ....Boundary of Mineral Claim
- ....Fault or major fracture
- ....Strike and dip of bedding
- ....Strike and dip of faults & fractures
- ....Talc with low to medium albite contents
- ....Talc with high albite contents
- ....Talc badly stained
- ....Albite rocks, containing talc in places
- ....Decomposed and albitized schists
- ....Quartzites, partly albitized

E.A. Sturmfels, August 1960



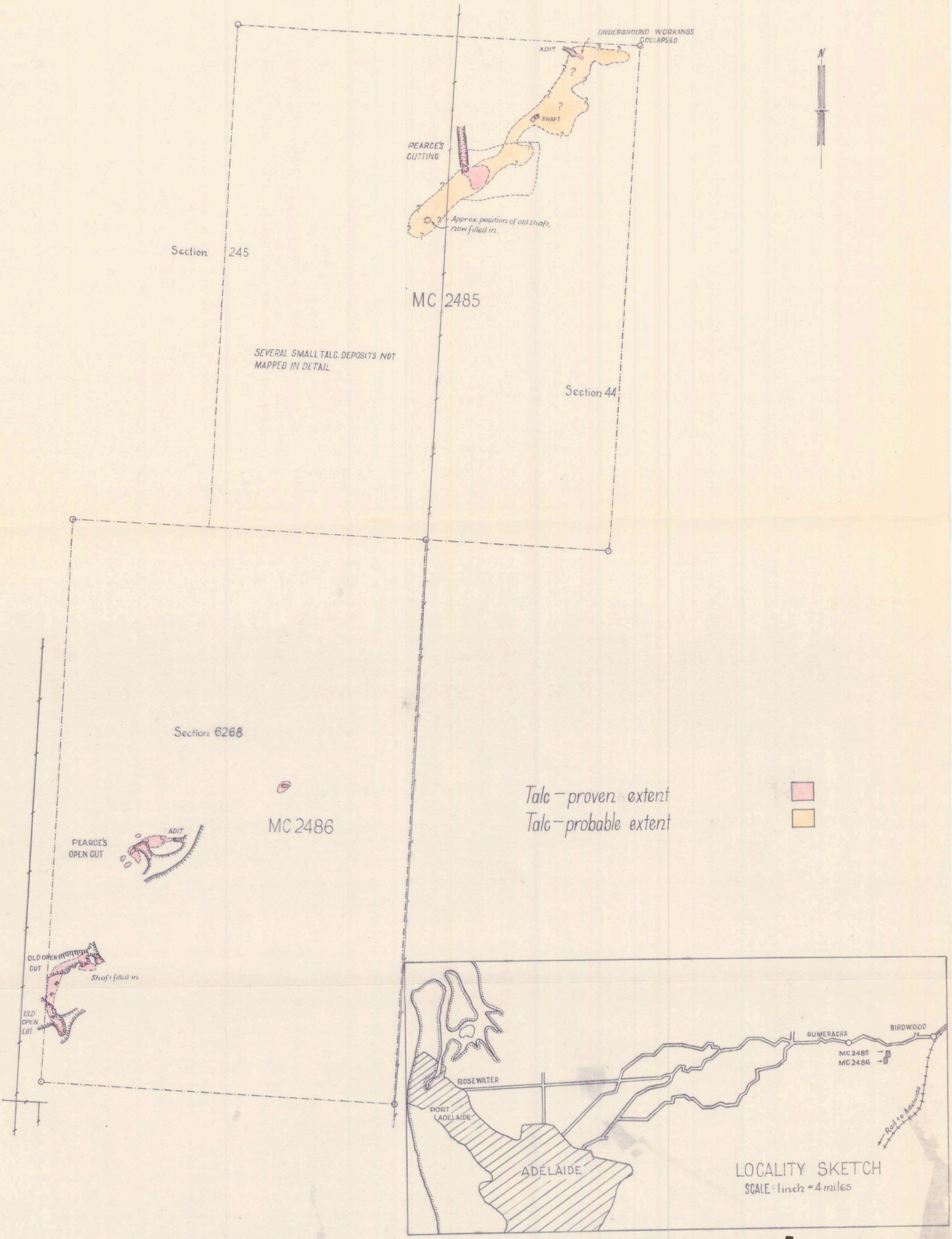
024

S.A. DEPARTMENT OF MINES

GUMERACHA TALC
Sec. 6268 Hd. Talunga
Industrial Rock Mines Pty Ltd. M.L. 3080
Underground workings at 19-2-64

No.	Amendment	Exd.	Date

Approved	Passed	Surveyed M.E.L.	Scale: 1 chain to 1 in.
Director		Drn. M.L.	64-206
		Tcd.	Ha 8
		Ckd.	
		Exd.	Date 27-2-64



3758 - 1

Geology by E.K. Sturmfels, August 1960

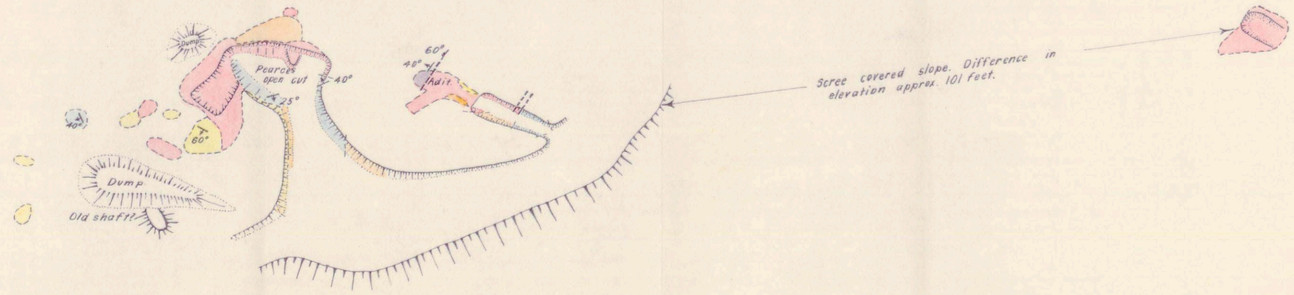
To accompany report by L.G. Nixon

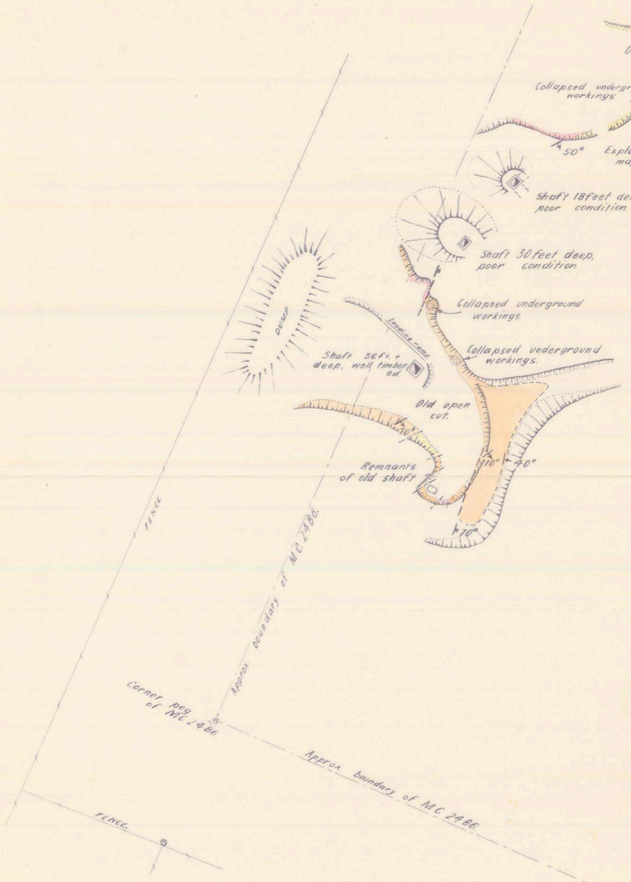
S.A. DEPARTMENT OF MINES

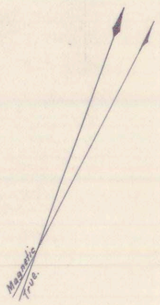
SKETCH MAP
TALC DEPOSITS ON MC 2485 AND MC 2486
NEAR GUMERACHA, S.A

No.	Amendment	Exd.	Date

Approved	Passed		Scale: 200ft to 1"
		Drn.	61 - 645
		Tcd. G.M.	Ha 8
		Ckd. R.R.	
Director		Exd.	Date 13-9-61







SCALE

0 50 100 150 200 250 FEET

LEGEND.

- Shaft.
- Fence
- Boundary of Mineral Claim
- Fault or major fracture.
- Strike and dip of bedding
- Strike and dip of faults & fractures
- Talc with low to medium albite contents.
- Talc with high albite contents.
- Talc badly stained
- Albite rocks, containing talc in places
- Decomposed and albitized schists.
- Quartzites, partly albitized

3758 -2

Geology by E.K. Strumfels. August 1960.

To accompany report by L.G. Nixon.

S.A. DEPT. OF MINES

200—10.57 6967

GEOLOGICAL MAP

TALC DEPOSITS ON MC2486

NEAR GUMERACHA S.A.

Req. No.
D.M.
Compiled from

Associated Drawing	No.	No.	Amendment	Exd.	Date

Approved	Passed		
		Drn.	Scale 40 feet to 1 inch.
		Tcd. G.K.W	61-646. Ha.8.
Director of Mines		Ckd.	
		Exd.	Date 14-9-61.