DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

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CAMEL FLAT MAGNESITE DEPOSIT,
NEAR COPLEY, NORTH WESTERN
FLINDERS RANGES. GEOLOGICAL
INVESTIGATIONS, 1984 AND 1985.
MC 1836, 1883

- DAVID LINKE CONTRACTOR P/L -

GEOLOGICAL SURVEY

by

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MINERAL RESOURCES

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CONTENTS

PLANS

DEPARTMENT OF MINES AND ENERGY
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Disk No. 155

CAMEL FLAT MAGNESITE DEPOSIT, NEAR COPLEY, NORTHWESTERN FLINDERS RANGES. GEOLOGICAL INVESTIGATIONS 1984 and 1985 MC 1836, 1883. David Linke Contractor P/L

ABSTRACT

Camel Flat magnesite is 3 km northwest of Leigh Creek South near the western margin of the northern Flinders Ranges.

Numerous steeply dipping reworked conglomeratic magnesite interbeds within the upper part of Late Proterozoic Skillogalee Dolomite range in thickness from several centimetres to several metres. At Camel Flat, the sequence crops out for 1.5 km along strike, and in a central zone 115 m thick, 25 magnesite interbeds are exposed.

Previous costeaning and drilling in the southern part of Camel Flat indicated that magnesite is low grade with high silica content. Sampling in 1984-85 proved that the northern part is higher grade.

Within Mineral Claims 1836 and 1883, an area 450 m along strike and 115 m across strike contains <u>inferred reserves</u> to 5 m above adjacent creek level of 207 000 tonnes of magnesite averaging 4.7% SiO_2, with overburden to ore ratio of 7:1.

INTRODUCTION

As part of a Statewide review of magnesite (Crettenden, 1985), the abandoned Copley workings south of Scammell Creek (now the southern part of the Camel Flat deposit) were inspected on 17 November 1983 by J.G. Olliver (Chief Geologist, Mineral Resources), L.C. Barnes (Principal Geologist, Industrial Minerals) and P.P. Crettenden (Field Assitant).

During 1983 and 1984, David Linke Contractor Pty. Ltd. discussed alternative sources to replace the current worked deposit at Myrtle Springs (23 km northwest of Copley) where overburden was excessive.

Deposits were recommended at Johnburgh (15 km east of Carrieton), Witchelina (60 km north of Leigh Creek South) and the old Copley deposit and extensions to the northwest (now Camel Flat).

Johnburgh was rejected as too small and Witchelina as too remote, and Camel Flat was selected. Accordingly, a mineral claim was pegged over Camel Flat on 6 January 1984.

The northern portion of the deposit, extending from Scammell Creek north for 900 m to Camel Flat Creek, was mapped by stadia theodolite on 4 to 7 December 1984 by the author, A. Christ (Student Geologist), P.P. Crettenden and S.J. Ewen (Field Assistants). Twenty five samples were submitted to Australian Mineral Development Laboratories (AMDEL) for analysis, and one sample was submitted for mineral identification.

Results from the analyses were sufficient to justify further work, and the author checked previous mapping on 13-14 April 1985. The southern portion of the deposit, south of Scammell Creek and including all previous workings, was mapped by stadia theodolite on 15-16 April 1985 by the author and P.P. Crettenden. A further 70 samples were submitted to AMDEL for analysis, being from traverses across strike. Results of analyses are presented in Appendix A.

Topographic contours on Figure 5, have been enlarged from Department of Lands orthophoto, at 1:10 000 scale, sheet No. 6546-7, with elevation in metres related to Australian Height Datum (AHD).

LOCATION AND ACCESS

Camel Flat magnesite is on Myrtle Springs Station near the western margin of the Northern Flinders Ranges. The deposit is 3 km northwest of Leigh Creek South township, and 5 km west-southwest of Copley, which are 527 and 531 km north of Adelaide respectively by road. The reserve surrounding Aroona Dam is adjacent to the southwest; Aroona Dam is the water supply for Leigh Creek South (Fig. 3 and 4).

The magnesite deposit is in gentle northwest trending ridges, 300 m above sea level, and rising up to 30 m above adjacent valley level.

The deposit is in an Environmental Class B Zone as defined in the Flinders Ranges Planning Area Development Plan; which states:

> 'Mining operations in the Environmental Class B Zone should only take place after precise delineation of the deposit concerned and if investigations have shown that alternative deposits are not available on other land in the locality outside the zone.'

The bitumen road north from Port Augusta extends past Leigh Creek South and Copley to Lyndhurst. Access to the magnesite deposit is via a graded dirt road leading west southwest from the bitumen at Copley towards Summit Tank. At 2.5 km, which is 450 m east of Summit Tank, a station track turns north through a gate, then west for 1 km to the southern end of the deposit. The track turns north towards Camel Flat Tank, along the eastern side of the magnesite deposit.

Published and unpublished maps include the following discrepancies in naming of local geographic features:

SADME

- Copley 1:63 360 Front Office Tenement Plan 795 (unpublished).
  Summit Tank - correct.
  Magnetite Creek - should be Magnesite Creek.
  Camel Flat Tank - not shown.

- COPLEY 1:250 000 geological map sheet (Coats, 1973)
  Summit Tank and Camel Flat Tank - not shown
  Magnesite Creek - correct
  Camel Flat -shown as area near Mount Playfair Well, 25 km NNW along strike from Camel Flat Tank; believed to be incorrectly located.

S.A. Department of Lands

- Copley 1:50 000 Topographic map No 6536-I; and
  1:10 000 orthophoto sheet No 6536-7.
  Summit Tank and Camel Flat Tank - correct
  Magnetic Creek - should be Magnesite Creek

- Myrtle 1:50 000 Topographic map No 6537-III. Does not show Camel Flat area near Mount Playfair Well.

In this report, Camel Flat magnesite is an informal name chosen because of proximity to Camel Flat Tank. Camel Flat Creek and Scammell Creek (Fig 5) are informal names for minor tributaries of Magnesite Creek which flows into Aroona Dam.

PREVIOUS INVESTIGATIONS

Since 1918, Camel Flat magnesite has been inspected or commented upon by a number of SADME officers, and was always referred to as Copley magnesite as follows:

- Jones (1918) - 'A little work has been done in one of the soft patches and 25 cwts of the fine powder magnesite were bagged up to be sent away as a trial parcel.'

- Ward (1918) - 'The material compares very unfavourably with other magnesites obtainable in South Australia, both in regard to quality and in regard to geographical position.' 'The material mined by Mr Dyer (claimholder) approaches more nearly to dolomite in composition than to magnesite.'

- Winton (1925) presented results of four analyses, with
  $MgCO_3$ from 86.9 to 95.7%
  $CaCO_3$ from 2.5 to 8.8%
  insolubles from 1.2 to 5.2%.

- Ward (1926) - 'It is considered that a large tonnage of magnesite is obtainable from very shallow workings on the principal veins if the price obtainable for magnesite of about 90% purity is sufficient to defray the cost of mining and transport to the market.' The possibility of calcination on site was raised to reduce transport.

- Segnit (1940) mapped an area of 0.6 km across strike by 2.3 km along strike, covering the 8 mineral claims (MC 51 to MC 58) held by A.F. Scammell. Four samples from Scammell Creek contained 3.0 to 9.8% SiO_2 and up to 1.7% CaO.

- Cornelius (1941) reported a 100 m long costean, 1 m deep, across strike, and stated 'A small tonnage has been railed each month from Copley, all of it having been gathered from the loose material scattered over the surface of the claims.'

- Cornelius (1942) discussed the merits of underground mining and open cut mining.

- Parkin (1946 and 1947) mapped costeans and two small open cuts and numbered 33 beds in the main costean. A total of 35 partial analyses were presented and 2 shallow angled drill holes were recommended.

- Parkin (1948) reported two drill holes:

  No 1 Bore, depressed 12° to the west below the main costean reached 200 ft 2 inches (61.0 metres) and 26 magnesite beds were analysed.

  No 2 Bore below the open cut to the north intersected two magnesite beds.

  Drill logs and analyses are presented in Appendix C and No 1 Bore is summarized on Figure 5.

- Willington (1954) outlined potential uses for magnesite and summarized South Australian sources and production.

MINERAL TENURE

This information is adapted from Crettenden (1985) and summarised in Table 1.

- The first claims near Copley, MC 10833 - 10835, were pegged on 9.5.18 by Dyer, Bottom and Ridgeway. Approximate locations are shown on Figure 2. Expiry date is unknown for these claims, but must have been prior to 16.8.22 (see F.W. Montague below).

- Four claims, MC 11064 - 11067, were pegged further south on 29.10.18 by A.C. Broughton. In January - February 1920, K.H. Wollaston repegged one of these as MC 11210 and pegged another claim, MC 11206, adjacent. A.C. White repegged the other 3 claims as MC 11207-9. Expiry date of these claims in unknown, and approximate locations only are shown on Figure 2.

- F.W. Montague pegged 4 claims, MC 11664 - 11667 in the main area of Camel Flat on 16.8.22, these being replaced by MC 11779 - 11782 on 9.3.23. These were replaced on 19.2.24 by MC 11988 - 11991 for the S.A. Mineral Sulphate of Ammonia Co Ltd., expiring on 19.7.26. They were quickly repegged by F.W. Montague on 26.7.26 as MC 12340 - 12343, and transferred one month later to the S.A. Prospecting Co Ltd as MC 12347 - 12350, finally expiring on 23.2.32.

- There was no mineral tenure for the next 8 years.

- Between 18.7.40 and 4.10.40, A.F. Scammell pegged 51 claims, MC 51-58 being in the main area of Camel Flat, from Summit Tank to Camel Flat Tank, with MC 66-68, 81-89, and 97-127 extending northwest along strike for 13 km.

MC 66-68, 81-89 and 97-127 were replaced by MC 239-281 then converted to ML 2788 - 2830 on 1.1.41 still for A.F. Scammell and transferred to F.H. Faulding and Co Ltd (Faulding) on 11.12.41.

MC 51-58 were replaced by MC 151-158 then converted to Mineral Leases (ML) 2763 - 2770 on 1.1.41 still for A.F. Scammell, and then transferred to Faulding on 13.3.41.

Thus by the start of 1942, all 51 claims pegged originally by A.F. Scammell were held as leases by Faulding.

- G.A. Greenwood pegged MC 132, 133 adjacent to the south of MC 51-58 (held by Scammell) on 19.10.40, replaced by MC 440-441 expiring on 21.6.46; and M.L. Trezona and W.R. O'Grady pegged MC 188, 189 further south on 16.12.40 expiring on 30.12.42.

- On 8.11.48, Faulding cancelled 39 leases, keeping only ML 2766-69 covering the main workings and ML 2813-2820 to the northwest. These 12 leases were cancelled on 31.12.62.

- There was then no mineral tenure for 14 years.

David Linke Contractor Pty. Ltd. (Linke) pegged a mineral claim on 6.1.84 and lodged application for registration on 25.1.84. The application was not registered as the area was partly within Electricity Trust of South Australia (ETSA) Reserve in section 373 out of hundreds, and partly within Leigh Creek Coalfield, reserved on 14.2.74 from the operation of the Mining Act (Figs. 3 and 4).

On 10.4.84, the area not covered by the two reserves was repegged, and on 11.4.84 an application was lodged to register a mineral claim. On 23.5.84, MC 1836 of 21.11 ha was registered for Linke over the southeastern half of Camel Flat deposit (Fig. 3).

On 19.6.84, access to the northwestern half of the deposit was discussed in Adelaide with Mr. Ron Morgan (ETSA Manager, Leigh Creek), Mr. R. Holding (ETSA) and SADME officers. A further meeting on 23.7.84 with Holding, Cyril Linke and SADME officers satisfied ETSA concern about environmental control, access, security and vandalism.

In September 1984, Commercial Minerals Ltd. won a major contract for supply of South Australian magnesite to the aluminium refinery in Queensland. Linke as contract miners, believed that Camel Flat would be required sooner than expected.

On 22.10.84, the Leigh Creek Coalfield reserve was amended to make the northwestern part of Camel Flat available for mining (Fig. 3). On 26.10.84, a claim was pegged, an application for registration was lodged on 16.11.84, and on 3.12.84, MC1883 of 33.24 ha was registered for Linke.

On 16.5.85, Linke applied for a mineral lease over MC 1836.

On 2.12.85, MC 1883 lapsed as no lease application had been lodged.

TABLE 1

MINERAL TENURE, CAMEL FLAT (formerly COPLEY) MAGNESITE

TENURE	HOLDER	COMMENCED	CANCELLED	COMMENTS
MC 10833	J. Dyer	09.05.18		
MC 10834	J.T. Bottom	09.05.18		
MC 10835	H.A. Ridgeway	09.05.18		
MC 11064-67	A.C. Broughton	29.10.18		
MC 11206	K.H. Wollaston	30.01.20		
MC 11207-9	A.C. White	03.02.20		Former MC 11065-7
MC 11210	K.H. Wollaston	09.02.20		Former MC 11064
MC 11664-67	F.W. Montague	16.08.22	20.11.22	
MC 11779-82	F.W. Montague	09.03.23		Former MC 11664-7
MC 11988-91	The S.A. Mineral Sulphate of Ammonia Co. Ltd.	29.02.24	19.07.26	Former MC 11779-82
MC 12340-43	F.W. Montague	26.07.26	19.08.26	Former MC 11988-91
MC 12347-50	S.A. Prospecting Co. Ltd.	21.08.26	23.02.32	Former MC 12340-43
MC 51-58	A.F. Scammell	18.07.40	02.12.40	
MC 66-68		10.08.40	05.04.41	
MC 81-84		06.09.40	05.04.41	
MC 85-89		04.09.40	05.04.41	
MC 97-100		11.09.40	05.04.41	
MC 101-109		18.09.40	05.04.41	
MC 110-113		23.09.40	05.04.41	
MC 114-117		25.09.40	05.04.41	
MC 118-121		26.09.40	05.04.41	
MC 122-127		04.10.40	05.04.41	
MC 132-133	G.A. Greenwood	19.10.40	18.07.42	
MC 151-158	A.F. Scammell	28.11.40	22.02.41	Former MC 51-58; converted to ML 2763-2770
ML 2763-65		01.01.41	08.11.48)	Transferred to
ML 2766-69		01.01.41	05.12.69) –	Faulding on
ML 2770		01.01.41	08.11.48)	13.03.41
MC 188	M.L. Trezona	16.12.40	30.12.42	
MC 189	W.R. O'Grady	16.12.40	30.12.42	
MC 239-281	A.F. Scammell	05.04.41	31.12.41	Former MC 66-68, 81-89, 97-127; converted to ML 2788-2830
ML 2788-2812		01.01.42	08.11.48)	Transferred to
ML 2813-2820		01.01.42	31.12.62) –	Faulding on
ML 2821-2830		01.01.42	08.11.48)	11.12.41
ML 2813-2820	Faulding	01.01.62	05.12.69	
MC 440-441	G.A. Greenwood	24.08.42	21.06.46	Former MC 132-3
MC 1836	Linke	25.05.84		Mineral Lease applied for on 16.05.85.
MC 1883		04.12.84		Expires 03.12.85

MINERAL PRODUCTION

This information is adapted from Crettenden (1985).

Production is detailed in Table 2 from returns submitted by tenement holders.

- H.A. Ridgway, one of the 3 original claimholders, produced 1 tonne in 1918.

- S.A. Prospecting Co Ltd produced 192 tonnes in 1926-1927.

- A.F. Scammell produced 15 tonnes in 1940 prior to transferring leases to Faulding.

- Faulding produced 5 823 tonnes from 1941 to 1955, with 801 and 798 tonnes in 1942 and 1943, and 708 tonnes in 1951. The main costean (Fig 6) was developed in 1941 by Faulding, and first reported by Cornelius (1941). Two other open cuts had been developed by 1946 (Parkin, 1946). Cornelius (1941) reported that most production was gathered from loose magnesite on the surface, presumably over the 14 km strike length of the leases held by Faulding. An estimated 2 000 tonnes came from the open cuts and costean. Thus, approximately 4 000 tonnes was scavenged as loose magnesite on the surface.

- The increased interest in magnesite in 1940-41, as evidenced by 55 new claims (Scammell, Greenwood, Trezona, O'Grady), and renewed production by Scammell then Faulding, coincided with the early years of World War II, when magnesite was in demand as a refractory and as a source of magnesium metal. However, most magnesite from Copley would have been used in pharmaceuticals.

- Production totalled 6 031 tonnes to the close of operations in 1955 when Faulding moved further north to Witchelina.

TABLE 2

MINERAL PRODUCTION

YEAR	TENURE	HOLDER	TONNES
1918	MC 10835	H.A. Ridgeway	1
1926	MC 12347-50	S.A. Prospecting Co. Ltd.	20
1927	" "		172
1940	MC 66	A.F. Scammell	15
1941	MC 2763-70	Faulding	316
1942	ML 2763-70, ML 2788-2830		801
1943	ML 2788-2830		798
1944	" "		340
1945	" "		433
1946	" "		461
1948	ML 2763-70		429
1949	ML 2766		353
1950	ML 2766-9, ML 2813-20		277
1951	" "		708
1952	" "		541
1953	" "		Nil
1954	" "		239
1955	" "		127
TOTAL			6 031

GEOLOGICAL SETTING

REGIONAL

Camel Flat magnesite is on COPLEY 1:250 000 geological map sheet (Coats, 1973).

Magnesite formed as interbeds in Skillogalee Dolomite, a widespread Late Proterozoic Burra Group sedimentary unit in the Adelaide Geosyncline. Burra Group near Copley comprises, in ascending stratigraphic order (from southwest to northeast):

- Copley Quartzite; red sandstone with minor dolomite and red and green shale, overlain by grey and white quartzite with minor shale. Total thickness is 1 980 m. Copley Quartzite abuts the Norwest Fault at its base.

- Skillogalee Dolomite; blue-grey dolomite, dolomitic siltstone, and conglomeratic and magnesite interbeds, with minor chert and stromatolitic interbeds. Magnesite is concentrated in the upper part. Total thickness is 1 740 m maximum.

- Myrtle Springs Formation; grey and green siltstone and greywacke, with minor dolomite and quartzite interbeds; up to 1 070 m thick.

- Unnamed grey-green dolomitic siltstone and shale, with minor dolomite, up to 275 m thick.

Burra Group sediments dip 70° to the northeast, and strike southeast-northwest. The sequence is visible for 28 km northwest to Mount Playfair Well, and for 14 km southeast. Burra Group is overlain unconformably by Late Proterozoic Umberatana Group sediments.

SKILLOGALEE DOLOMITE

Uppill (1979) divided Skillogalee Dolomite into lower Nankanbunyana Formation and upper Yadlamalka Formation (Fig. 4).

The type section for Nankanbunyana Formation is 300 m west of the southern corner of MC 1836 at Camel Flat, and comprises 'a sequence of interbedded sandstones and siltstones, with minor dolomite interbeds' totalling 538 m thick.

<u>Yadlamalka Formation</u> 'refers to that part of the previously mapped Skillogalee Dolomite characterized by interbedded dark grey dolomite, intraformational magnesite conglomerate and dolomitic sandstone,' and is 258 m thick in the type section in Depot Creek. The following description is based on Uppill (1979).

Yadlamalka Formation was deposited in a shallow water predominantly low energy environment, in which tidal effects were weak or insignificant, within a large shallow marine basin with low gradients.

Dominant carbonate facies is dark grey dolomite with planar or slightly wavy laminae, silty and sandy laminae and occasional graded laminae. A predominantly subtidal environment is indicated in which carbonate was deposited from suspension, with minor current activity introducing silt and sand.

Stromatolites are included in extensive thin dark grey dolomite interbeds, and formed in low energy subtidal environments. Organic activity, probably dominated by blue-green algae, may have been abundant, as evidenced by carbonaceous material in dolomite.

Magnesite was deposited as a chemical precipitate in low energy environments on marginal shelves and restricted lagoons protected from detrital influx, initially forming a fine grained laminated micritic magnesite, with a very low silt and sand content. The required alkali conditions may have been caused by addition of alkali continental water, or may have been due to organic activity (Forbes, 1961). The magnesite was subjected to extended periods of exposure and subsequent erosion, resulting in deposition of intraformational magnesite conglomerates, with low depositional slopes producing sheet conglomerates rather than channel based beds. Conglomerates vary from well sorted to poorly sorted, with angular or rounded clasts up to several centimetres. The amount of matrix is variable and can include silty and sandy dolomite.

SITE GEOLOGY

Camel Flat magnesite is in the upper half of Yadlamalka Formation within Skillogalee Dolomite (Fig. 4). Magnesite interbeds within grey dolomite strike northwest and dip 70° northeast, and the zone about 120 m thick with most numerous magnesite interbeds is approximately 150 m below the overlying Myrtle Springs Formation (Fig. 5).

MARKER BEDS

Ten dolomitic marker beds, which were visually more distinctive than magnesite beds which are all similar in outcrop, were continuous along strike. From west to east, in ascending stratigraphic order, the marker beds as shown on Figure 5 are as follows:

- Marker W, prominent massive dolomite, 3 to 4 m thick with outcrop up to 3 m high.

- Marker Z, prominent massive dolomite approximately 0.5 m thick, with distinctive saw tooth outcrop up to 1 m high.

- Marker A, slightly ferruginous hard dark grey fissile dolomite, 0.6 to 1.5 m thick.

- Marker B, hard grey fissile dolomite, 1 m thick, overlain by 0.2 to 0.3 m thick brown hard ferruginous dolomite.

- Marker B', hard dark grey to brown ferruginous dolomite, 0.5 m thick. Marker B is dominant to the north; Marker B' is dominant to the south. Marker A and B, B' form the main prominent ridgetop.

- Marker C, hard, dark grey, weathering to dark brown, ferruginous stromatolitic dolomite, 0.2 to 0.4 m thick. The stromatolites are prominent.

- Marker D, hard dark grey dolomite, with irregular ferruginous and stromatolitic dolomite comprising about 20% of the rock, 0.3 m thick.

- Marker D', 1 m east of Marker D, light brown ferruginous sandy dolomite, 0.1 m thick.

- Marker E, low subcrop of hard, light grey fissile dolomite, 0.3 m to 0.5 m thick.

- Marker F, forms the prominent ridge along the eastern margin of the deposit, and is massive dark grey dolomite, 2 to 4 m thick with outcrop up to 1 m high.

MAGNESITE LITHOLOGY

Magnesite interbeds range in thickness from several centimetres up to 3 metres. All magnesite interbeds are pelletal i.e. soft semi-lithified primary magnesite (chemically deposited sediment) was reworked into widespread pelletal magnesitic conglomerate.

Pellets, or clasts, vary in grain size from a common 2-5 mm up to 30 mm. Larger pellets are often elongate, slightly curled up, with rounded ends. Pellets are generally rounded, probably not so much by physical abrasion as by rolling up of soft plastic mud.

Finer 2-5 mm pelletal (or granular) magnesite is mostly well-sorted with a low matrix content, whereas coarser pelletal magnesite is generally poorly-sorted with high matrix content. The matrix includes terrigenous silt introduced by current flow during reworking of the magnesite.

Contacts between dolomite and magnesite interbeds are sharp and well-defined.

In places, magnesite exhibits graded bedding (coarse at the base, fining upwards) or less commonly, reverse graded bedding (fine at the base, coasening upwards). Uppill (1979) considered reverse graded bedding to be caused by reworking in a single intense storm.

There are only rare dolomite clasts, indicating that dolomite may have been more lithified, and less succeptible to erosion.

No micritic (primary) magnesite beds were seen. Either all have been eroded, or this area was not a site for primary deposition.

Mineralogically, magnesite clasts and rare dolomite clasts are enclosed by matrix of detrital quartz and feldspar silt, micritic magnesite and possibly micritic dolomite. Minor muscovite was identified in sample RS 318 (Appendix B) in the quarry north of main costean; 'dolomite' identified in this sample is in fact magnesite, the two being indistinguishable by microscope.

CORRELATION OF MAGNESITE BEDS

In excess of 60 individual magnesite beds are exposed in Scammell Creek and Camel Flat Creek.

The more prominent magnesite beds which could be traced in more or less continuous outcrop, were numbered as follows:

- W1 to W6 are west of the main ridge top defined by Markers A and B.
- CF1 to CF11, with other minor beds, are east of the main ridge top.

No magnesite beds outside this main zone could be traced along strike.

Magnesite beds were marked with red paint at approximately 100 m intervals to assist correlations, and to assist in future re-identification of individual beds.

Detailed mapping of the costean on MC 1836 (Figure 6), identified more magnesite beds than were visible in outcrop, and those visible in outcrop were not necessarily the most prominent in the costean. Sixteen beds, CF4B to CF11 and others unnamed, totalling 13.6 m thick were visible on the surface compared to 35 beds totalling 26.5 m exposed in the costean. The 1984-85 numbering system used for outcrop is correlated with that used in the costean by Parkin (1948) on cross section, Figure 6.

Numerous magnesite beds east and west of the main zone crop out in Camel Flat Creek. None could be traced on the surface along strike. Those to the west within 100 m of Marker W are often more coarsely pelletel with high matrix content compared to the main zone. Similarly, numerous beds east of the main zone crop out in Scammell Creek east of the costean, and in a small creek 160 m southeast of the costean.

Magnesite weathers white and is readily distinguishable from surrounding dolomite on the surface as low subcrop, rarely cropping out sufficiently to enable accurate thickness measurements. Where magnesite either fades out on the surface, or apparently thins, it may be continuous beneath thin colluvium.

Two holes were drilled in the mid 1940's (Parkin, 1948).

No 1 Bore collared at the eastern end of the main costean (Figure 6) was depressed 20° to the southwest approximately perpendicular to bedding and intersected the same sequence as in the costean. Total depth was 61 m.

The drill log is presented in Appendix C, and shown in cross section, Figure 6, and partial analyses from Parkin (1948) are in Appendix C.

No 2 Bore, collared 17 m east of the small quarry north west of the main costean and depressed 30° to the southwest, intersected the eastern two magnesite beds in the quarry (bed CF8 and a thin unnumbered bed to the east). The bore was abandoned at 9 m. Two analyses are in Appendix C.

FAULTING

The sedimentary sequence is offset by a major east-west fault along Scammell Creek, informally called Scammell Creek Fault, with a sinistral displacement of 20 m.

Four small faults with displacement less than 1 m were noted along Markers A and B, the northern most having a sinistral displacement, the remainder being dextral. With these exceptions, the main zone of magnesite is free of faulting.

The following numerous small faults were visible in the extreme west of the area.

- On Marker W, 10 small faults with dextral displacement of several metres; strike is uncertain.

- On Marker W, a large fault zone about 20 m wide with 12 m sinistral displacement; strike is uncertain.

- West of Marker W in Scammell Creek, a north-south fault with 0.5 m dextral displacement cuts across 12 un-named thin magnesite beds.

- 35 metres northeast of Marker W, 15 small faults with displacement of 0.5 to 1.0 m are visible in Scammell Creek; 13 are dextral and 2 are sinistral.

SAMPLING

Ninety five samples were submitted to AMDEL for analysis as follows:

- Samples A2813/84 to A2839/84 collected and submitted in 1984 (Samples A2831/84 and A2834/84 were discarded due to doubts about their location).

- Samples A198/85 to A267/85 collected and submitted in 1985.

Samples were from traverses across strike, being either chipped from costeans or outcrop, or grab samples where outcrop is poor. Sampling traverses were from bed W3 east to bed CF11. Beds W4 to W6 are thin with poor outcrop and were not included. Most traverses were related to survey stations and marked with survey picket.

Traverses were as follows, from southeast to northwest:
MC 1836:

- <u>Main Costean</u> (Traverse MC on Fig. 5), selected beds between CF11 and CF5 to compare with analyses in Parkin (1948), then west of the costean to bed W2; also bed CF8 in small quarry to north; total 14 samples.

- Traverse at <u>Station F</u>, from bed CF11 west to bed W3 includes duplicate sample of CF1; total 19 samples.

- Partial traverse at <u>Station G</u>, beds W1 to W3; 3 samples.

MC1883:

- Traverse at Station H, beds CF1 to CF11; includes duplicate samples of beds CF5, CF6; total 18 samples.

- Traverse across saddle between Station H and I, bed CF11 west to bed W3; 19 samples.

- Traverse at Station I, beds CF1 to CF11; 10 samples.

- Partial traverse at Station J, beds W1 to W3 and CF5; 4 samples.

- Camel Flat Creek, bed CF4 west to bed W3, and W6; 8 samples.

Results of analyses are detailed in Appendix A, and summarized in Tables 3 to 7.

Tables 3 to 7 also include three calculated compositions as follows:

- Composition on calcined basis, i.e. composition after removal of all volatiles equivalent to total loss on ignition (LOI), thereby approximately doubling percentage of other components in the raw sample.
- calculated carbonate content by assuming all CaO is in calcite, and all MgO is in magnesite.
- calculated theoretical composition by assuming all CaO is in dolomite, and remaining MgO is in magnesite. Moisture is the difference between CO_2 and loss on ignition, and all remaining components are included in silicates. As no free calcite was seen at Camel Flat, this is probably closest to true mineralogical composition.

Partial analyses for 62 samples from the main costean area were presented in Parkin (1948) and are reproduced in Appendix C; insolubles are shown for all samples, but MgO and CaO were determined for only 40 samples. Insolubles are approximately equivalent to the silicates content calculated for the 1984-85 samples, which in most cases is approximately 50% greater than measured SiO_2%.

TABLE 3

SAMPLES ON TRAVERSE THROUGH MAIN COSTEAN, MC 1836

MAGNESITE BED NO.	SAMPLE NO.	ANALYSES CORRECTED TO 100%						100-L01	COMPOSITION ON CALCINED BASIS				CALCULATED CARBONATE CONTENT		CALCULATED THEORETICAL COMPOSITION			
		MgO	CaO	SiO_2	Fe_2O_3	CO_2	LO1		MgO	CaO	SiO_2	Fe_2O_3	$MgCO_3$	$CaCO_3$	Magnesite	Dolomite	Silicates & Quartz	Moisture
CF11, in costean	A198/85	45.2	1.57	5.70	0.09	45.5	47.4	52.6	85.9	3.0	10.8	0.17	86.9	2.7	84.6	5.1	8.4	1.9
CF10, in costean	A199/85	39.5	3.88	12.2	<0.01	40.3	44.1	55.9	70.7	6.9	21.8	<0.01	73.3	6.8	67.6	12.5	16.3	3.8
CF 9, in costean	A2839/84	41.3	0.38	16.9	0.08	38.4	41.3	58.7	70.4	0.6	28.8	0.14	74.7	0.7	74.1	1.2	21.7	2.9
CF 8, in costean	A200/85	46.3	0.35	4.61	<0.01	46.8	48.7	51.3	90.3	0.7	9.0	<0.01	91.2	0.6	90.7	1.1	6.2	1.9
CF 8, quarry north of costean	A2838/84	44.5	1.03	7.70	0.18	38.4	46.3	53.7	82.9	1.9	14.3	0.34	73.8	1.8	72.2	3.3	16.6	7.9
CF 6, in costean	A201/85	46.8	0.43	3.43	0.08	47.8	49.3	50.7	92.3	0.9	6.8	0.16	93.1	0.8	92.4	1.4	4.7	1.5
CF 5, in costean	A202/85	43.9	3.81	3.93	<0.01	46.8	48.4	51.6	85.1	7.4	7.6	<0.01	86.1	6.7	80.5	12.3	5.7	1.6
CF4A, west of costean	A203/85	45.3	2.15	4.17	0.03	46.2	48.4	51.6	87.8	4.2	8.1	0.06	87.4	3.8	84.2	6.9	6.7	2.2
CF 4, west of costean	A204/85	39.9	7.34	7.14	0.03	43.7	45.4	54.6	73.1	13.4	13.1	0.06	73.9	12.8	64.1	23.6	10.6	1.7
CF 3, west of costean	A205/85	41.4	7.11	1.95	0.08	48.0	49.4	50.6	81.8	14.1	3.9	0.16	83.6	12.4	72.8	23.3	2.4	1.4
CF 2, west of costean	A206/85	45.8	2.23	1.37	0.15	47.8	50.5	49.5	92.5	4.5	2.8	0.30	90.4	3.9	87.1	7.2	3.1	2.7
CF 1, west of costean	A207/85	43.8	4.35	1.16	0.23	49.0	50.5	49.5	88.5	8.8	2.3	0.46	89.4*	7.6	83.2	14.0	1.4	1.5
W 1, west of costean	A208/85	40.8	7.06	5.13	<0.01	45.4	47.1	52.9	77.1	13.4	9.7	<0.01	78.6	12.3	68.2	22.7	7.4	1.7
W 2, west of costean	A209/85	38.3	3.98	14.2	0.15	41.0	43.4	56.6	67.7	7.1	25.1	0.27	74.5	7.0	68.7	12.8	16.1	2.4

TABLE 4

SAMPLES ON TRAVERSE THROUGH SURVEY STATION F, MC 1836

MAGNESITE BED NO.	SAMPLE NO.	ANALYSES CORRECTED TO 100%						100-L01	COMPOSITION ON CALCINED BASIS				CALCULATED CARBONATE CONTENT		CALCULATED THEORETICAL COMPOSITION			
		MgO	CaO	SiO_2	Fe_2O_3	CO_2	L01		MgO	CaO	SiO_2	Fe_2O_3	$MgCO_3$	$CaCO_3$	Magnesite	Dolomite	Silicates & Quartz	Moisture
CF 11	A210/85	43.8	3.35	4.53	0.26	45.6	48.1	51.9	84.4	6.5	8.7	0.50	84.5	5.9	79.5	10.8	7.2	2.5
CF 10E	A211/85	44.9	2.77	2.63	0.25	47.6	49.5	50.5	88.9	5.5	5.2	0.50	89.2	4.8	85.1	8.9	4.1	1.9
CF 10	A212/85	38.1	10.7	2.59	0.12	45.6	48.5	51.5	74.0	20.8	5.0	0.23	73.7	18.7	58.0	34.4	4.7	3.0
CF 10W	A213/85	44.0	4.27	2.02	0.09	47.1	49.7	50.3	87.5	8.5	4.0	0.18	86.0	7.5	79.7	13.6	4.0	2.8
CF 9	A214/85	46.4	1.03	3.87	0.11	48.1	48.6	51.4	90.3	2.0	7.5	0.21	92.8	1.8	91.2	3.3	4.9	0.5
CF 8	A215/85	42.3	6.00	2.42	0.04	47.5	49.2	50.8	83.3	11.8	4.8	0.08	84.3	10.5	75.4	19.3	3.5	1.7
CF 7	A216/85	43.4	4.58	2.93	0.15	47.6	49.0	51.0	85.1	9.0	5.8	0.29	86.6	8.0	79.8	14.7	4.1	1.4
CF 7W	A217/85	45.4	2.47	3.18	0.06	47.7	49.0	51.0	89.0	4.8	6.2	0.12	89.9	4.3	86.2	7.9	4.6	1.3
CF 6	A218/85	45.7	1.83	3.66	0.26	47.7	48.5	51.5	88.7	3.5	7.1	0.50	90.8	3.2	88.1	5.9	5.1	0.8
CF 5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CF 4B	A219/85	42.6	5.26	4.41	0.05	46.1	47.8	52.2	81.6	10.1	8.5	0.10	82.6	9.2	74.9	16.9	6.6	1.7
CF 4A	A220/85	44.3	3.90	1.79	0.11	48.7	50.0	50.0	88.6	7.8	3.6	0.22	89.7	6.8	84.0	12.5	2.3	1.3
CF 4	A221/85	36.3	11.6	5.62	0.14	44.7	46.3	53.7	67.6	21.6	10.5	0.26	70.6	20.3	53.5	37.3	7.5	1.6
CF 3	A222/85	42.9	5.30	2.00	0.23	48.3	49.6	50.4	85.1	10.5	4.0	0.46	86.9	9.3	79.1	17.0	2.6	1.3
CF 2	A223/85	46.0	1.76	1.74	0.31	49.7	50.3	49.7	92.6	3.5	3.5	0.62	93.9	2.1	91.3	5.7	2.1	~ 1.0
CF 1	A224/85	38.1	9.77	4.92	0.37	44.9	46.9	53.1	71.8	18.4	9.3	0.70	73.7	17.1	59.3	31.4	7.3	2.0
CF 1	A2825/84	39.8	7.39	5.13	0.41	48.2*	46.8	53.2	74.8	13.9	9.6	0.77	81.3*	12.9	70.0	23.8	6.2	0
W 1	A225/85	41.1	6.89	3.06	0.37	47.6	48.5	51.5	79.8	13.4	5.9	0.72	83.2	12.1	73.1	22.2	3.8	0.9
W 2	A226/85	44.1	3.45	3.75	0.41	46.9	48.2	51.8	85.1	6.7	7.2	0.79	86.9	6.0	81.8	11.1	5.7	1.3
W 3	A227/85	43.2	4.41	3.94	0.34	46.9	48.1	51.9	83.2	8.5	7.6	0.66	85.5	7.7	79.0	14.2	5.6	1.2
SAMPLES ON TRAVERSE THROUGH SURVEY STATION G, MC 1836																		
W 1	A2822/84	42.9	4.56	1.81	0.49	56.6*	50.3	49.7	86.3	9.2	3.6	0.99	87.6*	8.0	80.9	14.7	2.3	?2.2
W 2	A2819/84	33.7	0.48	29.1	1.02	32.6	35.6	64.4	52.3	0.8	45.2	1.58	63.2	0.8	62.5	1.6	33.0	3.0
W 3	A2816/84	33.2	0.44	31.6	0.27	30.3	34.3	65.7	50.5	0.7	48.1	0.41	58.7	0.8	58.1	1.4	36.6	4.0

TABLE 5

SAMPLES ON TRAVERSE THROUGH SURVEY STATION H, MC 1883

MAGNESITE BED NO.	SAMPLE NO.	ANALYSES CORRECTED TO 100%						100-LOI	COMPOSITION ON CALCINED BASIS				CALCULATED CARBONATE CONTENT		CALCULATED THEORETICAL COMPOSITION			
		MgO	CaO	SiO_2	Fe_2O_3	CO_2	LOI		MgO	CaO	SiO_2	Fe_2O_3	$MgCO_3$	$CaCO_3$	Magnesite	Dolomite	Silicates & Quartz	Moisture
CF 11	A228/85	42.4	3.86	7.12	0.38	45.3	45.8	54.2	78.2	7.1	13.1	0.70	83.2	6.7	77.4	12.4	9.7	0.5
CF 10E	A229/85	44.6	2.73	3.37	0.32	47.4	49.1	50.9	87.6	5.4	6.6	0.63	88.9	4.8	84.9	8.8	4.8	1.7
CF 10	A230/85	41.4	6.77	2.89	0.18	46.8	48.8	51.2	80.9	13.2	5.6	0.35	81.8	11.8	71.9	21.8	4.4	2.0
CF 10W	A231/85	44.0	4.16	2.79	0.15	46.9	48.9	51.1	86.1	8.1	5.5	0.29	85.8	7.3	79.7	13.4	4.9	2.0
CF 8	A232/85	42.7	5.58	3.11	0.07	47.0	48.5	51.5	82.9	10.8	6.0	0.14	83.9	9.8	75.7	18.0	4.8	1.5
CF 7	A233/85	42.0	6.59	3.38	0.12	47.4	48.1	51.9	80.9	12.7	6.5	0.23	83.2	11.5	73.5	21.2	4.7	0.7
CF 7W	A234/85	43.3	5.03	3.70	0.05	47.2	48.0	52.0	83.3	9.7	7.1	0.10	85.1	8.8	77.7	16.2	5.4	0.8
CF 6	A235/85	46.1	1.63	2.69	0.28	48.3	49.4	50.6	91.1	3.2	5.3	0.55	92.3	2.9	89.9	5.2	3.9	1.1
CF 6	A2837/84	46.6	1.42	2.24	0.21	44.5	49.5	50.5	91.1	2.8	4.4	0.42	85.1	2.5	83.1	4.6	7.4	5.0
Un-named bed between CF 5, CF 6	A236/85	39.7	5.72	8.78	0.20	42.9	44.6	55.4	71.7	10.3	15.9	0.36	75.7	10.0	67.3	18.4	12.6	1.7
CF 5	A237/85	42.1	6.46	3.25	0.07	45.7	48.1	51.9	81.1	12.5	6.3	0.13	80.1	11.3	70.6	20.8	6.2	2.4
CF 5	A2836/84	44.9	4.96	2.09	<0.01	47.3	48.0	52.0	86.4	9.5	4.0	<0.01	85.4	8.7	78.1	16.0	5.2	0.7
CF 4B	A238/85	45.0	3.44	2.83	0.07	47.2	48.7	51.3	87.7	6.7	5.5	0.14	87.5	6.0	82.4	11.1	5.1	1.5
CF 4A	A239/85	43.6	4.75	2.69	0.13	47.3	48.9	51.1	85.3	9.3	5.3	0.25	92.8	8.3	78.7	15.3	4.4	1.6
CF 4	A240/85	36.7	11.0	7.62	0.08	42.3	44.6	55.4	66.3	19.9	13.8	0.14	66.8	19.2	50.6	35.4	11.7	2.3
CF 3	A241/85	45.1	3.21	2.19	0.20	47.3	49.4	50.6	89.1	6.3	4.3	0.40	88.0	5.6	83.3	10.3	4.4	2.1
CF 2	A2828/84	43.5	3.25	2.91	0.19	53.5	50.0	50.0	87.0	6.5	5.8	0.38	88.8*	5.7	84.0	10.5	3.2	?2.2
CF 1	A243/85	42.5	5.50	2.22	0.36	47.6	49.2	50.8	83.7	10.8	4.4	0.71	85.2	9.6	77.1	17.7	3.5	1.6

TABLE 6

SAMPLES ON TRAVERSE ACROSS SADDLE MIDWAY BETWEEN SURVEY STATIONS H AND I, MC 1883

MAGNESITE BED NO.	SAMPLE NO.	ANALYSES CORRECTED TO 100%						100-L01	COMPOSITION ON CALCINED BASIS				CALCULATED CARBONATE CONTENT		CALCULATED THEORETICAL COMPOSITION			
		MgO	CaO	SiO_2	Fe_2O_3	CO_2	LO1		MgO	CaO	SiO_2	Fe_2O_3	$MgCO_3$	$CaCO_3$	Magnesite	Dolomite	Silicates & Quartz	Moisture
CF 11	A244/85	41.1	5.36	6.61	0.40	44.0	46.1	53.9	76.3	9.9	12.3	0.74	78.4	9.4	70.5	17.2	10.2	2.1
CF 10E	A245/85	43.1	4.66	4.54	0.34	46.3	47.2	52.8	81.6	8.8	8.6	0.64	83.9	8.2	77.1	15.0	6.9	0.9
CF 10	A246/85	38.7	9.38	5.10	0.14	45.1	46.6	53.4	72.5	17.6	9.6	0.26	74.6	16.4	60.9	30.2	7.4	1.5
CF 10W	A247/85	42.8	5.96	1.93	0.11	48.2	49.1	50.9	84.1	11.7	3.8	0.22	85.7	10.4	77.0	19.2	2.9	0.9
CF 9	A248/85	46.5	1.69	2.45	0.08	49.0	49.2	50.8	91.5	3.3	4.8	0.16	93.5	3.0	91.1	5.4	3.2	0.2
CF 8	A249/85	38.1	9.75	6.67	0.08	44.4	45.1	54.9	69.4	17.8	12.2	0.15	72.7	17.1	58.4	31.4	9.7	0.7
CF 7W	A250/85	46.9	1.55	1.54	0.03	49.3	50.1	49.9	94.0	3.1	3.1	0.06	94.3	2.7	92.1	5.0	2.3	0.2
CF 6	A251/85	46.0	2.07	2.05	0.22	49.0	49.7	50.3	91.5	4.1	4.1	0.44	93.0	3.6	90.0	6.7	2.7	0.7
CF 5	A252/85	44.0	4.81	1.94	0.08	48.9	49.2	50.8	86.6	9.5	3.8	0.16	88.8	8.4	81.7	15.5	2.6	0.3
CF 4B	A253/85	46.6	1.73	1.96	0.09	47.4	49.7	50.3	92.6	3.4	3.9	0.18	90.4	3.0	87.8	5.6	4.4	2.3
CF 4A	A254/85	44.6	3.62	2.24	0.08	45.7	49.5	50.5	88.3	7.2	4.4	0.16	84.3	6.3	78.9	11.6	5.7	3.8
CF 4	A255/85	40.0	8.15	5.53	0.02	45.4	46.3	53.7	74.5	15.2	10.3	0.04	77.0	14.3	65.1	26.2	7.8	0.9
CF 3	A256/85	42.2	6.01	2.75	0.18	44.5	48.9	51.1	82.6	11.8	5.4	0.36	78.4	10.5	69.6	19.3	6.7	4.4
CF 2	A257/85	44.2	4.09	2.00	0.27	47.4	49.5	50.5	87.5	8.1	4.0	0.53	86.9	7.2	80.9	13.2	3.9	2.1
CF 1	A258/85	43.9	3.83	1.65	0.30	48.5	50.4	49.6	88.5	7.7	3.3	0.60	89.4	6.7	83.8	12.3	2.1	1.9
Un-named bed west of CF 1	A259/85	42.8	3.22	6.10	0.68	44.6	46.8	53.2	80.5	6.1	11.5	1.28	82.7	5.6	78.0	10.4	9.4	2.2
W 1	A260/85	44.9	2.96	1.44	0.16	48.4	50.5	49.5	90.7	6.0	2.9	0.32	90.5	5.2	86.2	9.5	2.2	2.1
W 2	A261/85	44.5	3.12	3.81	0.03	47.2	48.6	51.4	86.6	6.1	7.4	0.06	87.9	5.5	83.4	10.0	5.3	1.4
W 3	A262/85	42.0	5.50	3.71	0.11	47.0	48.6	51.4	81.7	10.7	7.2	0.21	83.9	9.7	76.0	17.7	4.7	1.6

TABLE 7

SAMPLES ON TRAVERSE THROUGH SURVEY STATION I, MC 1883

MAGNESITE BED NO.	SAMPLE NO.	ANALYSES CORRECTED TO 100%						100-L01	COMPOSITION ON CALCINED BASIS				CALCULATED CARBONATE CONTENT		CALCULATED THEORETICAL COMPOSITION			
		MgO	CaO	SiO_2	Fe_2O_3	CO_2	L01		MgO	CaO	SiO_2	Fe_2O_3	$MgCO_3$	$CaCO_3$	Magnesite	Dolomite	Silicates & Quartz	Moisture
CF 11	A263/85	45.0	1.76	2.06	0.26	48.9	51.0	49.0	91.8	3.6	4.2	0.53	91.9*	3.1	89.3	5.7	3.0	2.1
CF 9	A264/85	44.2	3.71	2.79	0.07	47.6	49.2	50.8	87.0	7.3	5.5	0.14	87.8	6.5	82.4	11.9	4.0	1.6
CF 8	A265/85	38.9	8.25	4.87	0.09	45.6	48.0	52.0	74.8	15.9	9.4	0.17	77.3	14.4	65.1	26.5	6.0	2.4
CF 7W	A266/85	43.7	3.59	2.55	0.04	48.5	50.1	49.9	87.6	7.2	5.1	0.08	89.8	6.3	84.0	11.6	2.9	1.6
CF 6	A242/85	45.3	2.72	1.98	0.20	47.4	49.7	50.2	90.4	5.4	3.9	0.40	88.9	4.8	84.9	8.8	3.9	2.3
CF 5	A267/85	41.1	6.50	4.85	0.06	46.1	47.6	52.4	78.4	12.4	9.3	0.12	80.8	11.4	71.2	20.9	6.4	1.5
CF 4	A2833/84	45.8	1.73	2.77	0.17	50.8	49.5	50.5	90.7	3.4	5.5	0.34	93.5*	3.0	91.0	5.6	2.9	?0.4
CF 3	A2830/84	43.8	4.08	2.34	0.15	47.1	49.6	50.4	86.9	8.1	4.6	0.30	86.3	7.1	80.3	13.1	4.0	2.5
CF 2	A2827/84	44.1	3.59	1.43	0.22	52.8	50.6	49.4	89.3	7.3	2.9	0.45	90.1*	6.3	84.8	11.6	1.7	?2.0
CF 1	A2824/84	43.9	3.78	1.63	0.35	52.2	50.3	49.7	88.3	7.6	3.3	0.70	89.6*	6.6	84.1	12.2	2.0	?1.7
SAMPLES ON TRAVERSE THROUGH SURVEY STATION J, MC 1883																		
CF 5	A2835/84	40.8	8.11	4.93	<0.01	48.1	46.2	53.8	75.8	15.1	9.2	<0.01	82.4	14.2	66.7	26.1	7.2	0
W 1	A2821/84	44.3	3.44	1.59	0.23	54.1	50.5	49.5	89.5	6.9	3.2	0.46	90.5*	6.0	85.3	11.1	1.8	?1.8
W 2	A2818/84	40.8	6.83	3.32	0.04	45.2	49.0	51.0	80.0	13.4	6.5	0.08	78.6	12.0	68.5	22.0	5.7	3.8
W 3	A2815/84	44.7	2.64	3.70	0.13	45.1	48.9	51.1	87.5	5.2	7.2	0.26	84.5	4.6	80.6	8.5	7.1	3.8
SAMPLES IN CAMEL FLAT CREEK, MC 1883																		
CF 4	A2832/84	33.9	11.3	11.6	0.08	40.9	42.4	57.6	58.9	19.6	20.1	0.14	63.6	19.8	47.0	36.4	15.1	1.5
CF 3	A2829/84	45.4	2.40	2.05	0.09	46.7	50.1	49.9	91.0	4.8	4.1	0.18	88.0	4.2	84.5	7.7	4.4	3.4
CF 2	A2826/84	45.9	0.61	4.46	0.24	53.2	48.9	51.1	89.8	1.2	8.7	0.47	93.7*	1.1	92.8	2.0	4.7	?0.6
CF 1	A2823/84	42.9	3.87	5.19	0.34	48.8	47.7	52.3	82.0	7.4	9.9	0.65	87.6*	6.8	81.9	12.5	5.5	0
W 1	A2820/84	45.2	2.26	3.60	<0.01	46.2	49.0	51.0	88.6	4.4	7.1	<0.01	87.2	3.9	83.9	7.3	6.1	2.8
W 2	A2817/84	44.1	1.51	4.98	0.06	44.6	48.6	51.4	85.8	2.9	9.7	0.12	85.2	2.6	83.0	4.9	8.2	4.0
W 3	A2814/84	43.8	3.47	3.87	0.17	45.0	48.7	51.3	85.4	6.8	7.5	0.33	83.1	6.1	78.0	11.2	7.2	3.7
W 6	A2813/84	45.1	1.39	5.72	0.24	45.0	47.6	52.4	86.1	2.6	10.9	0.46	86.2	2.4	84.1	4.5	8.9	2.6

NB. *Denotes excess CO_2

SPECIFICATIONS

Specifications for a variety of end uses are detailed by Spry (1974) and summarized in Table 8. Specifications for some uses are quoted on a calcined basis, and others are quoted on raw magnesite.

Some end uses require much higher grade than could be produced at Camel Flat, and only those specifications which are close to grade at Camel Flat have been reproduced herein.

Refactory magnesite, on a calcined basis:

- minimum MgO 80 to 83%,
- maximum CaO 3.2 to 5.4%,
- maximum SiO_2 6.6 to 8.2%.

Analyses in this report are compared to SiO_2 < 8%, and MgO > 83% and > 88.5%.

Chemical magnesite, on a calcined basis:

- minimum MgO 84 to 87%,
- maximum CaO 1.8 to 2.5%,
- maximum SiO_2 11% or is not specified.

These specifications are more stringent than for refractory magnesite.

Analyses in this report are compared to MgO > 83%, and CaO < 3.5% and < 5.5%.

Water Filtration Magnesite: on a raw basis, the only requirement is that SiO_2 is less than 6%, and preferably less than 4%.

TABLE 8

SPECIFICATION FOR MAGNESITE USAGE
Adapted from Spry, 1974

	MgO	CaO	SiO_2	Al_2O_3	Fe_2O_3	CO_2	LOI
<u>Chemical Uses</u>							
1. Artificial rubber, calcined basis	>87-92.5	<2-2.5	<---------total 1-4----------->			-	-
2. Oxychloride flooring, calcined basis	>87	<2.5				2.5	8
3. Sorrel cement,							
- crude magnesite	>43.3	<0.9	<5.7	<0.3	1.3	48.7	
- calculated on calcined basis	>84.4	<1.8	<11.1	<0.6	2.5	-	
<u>Dead Burned Magnesite Refractories</u>							
1. Dead burned, brick grade	>83	<3.2	<6.6	<1.7	4.4	-	
2. Dead burned, maintenance grade	>80-89	<5.6	<7.0	<1.3	5.0	-	
3. Raw magnesite produced in US	>42.5	<2.8	<4.2	0.4	1.0	48.6	
- calculated on calcined basis	>82.7	<5.4	<8.2	0.8	1.9	-	

RESERVES

TONNAGE CALCULATIONS

Reserves have been calculated for a proposed mine site between survey stations F and I for magnesite beds W3 east to CF11. About 2/3rds of this area is in MC1883 and the remainder is in MC1836.

This area was chosen because:

- 4 sample traverses are included, incorporating 66 of the 92 samples (ignoring duplicates);
- of these 66 samples, 49 contained less than 4% silica, an additional 10 samples contained less than 6% silica and only 7 samples contained more than 6% silica;
- Outcrop is good and most beds were traceable along strike;
- Topography is such that a working face could easily be established along the eastern side of the hill;
- Overburden ratio would increase substantially if beds east of CF11 or west of W3 were included.

Strike length is 450 m (southeast to northwest), and width across strike is 115 m. Reserves were calculated down to 275 m AHD, corresponding to the lowest point in the northern corner. A quarry to this level would still drain into the Camel Flat Creek to the north. Yield below 275 m AHD has been calculated as cubic metres per vertical metre. Cubic metres were converted to tonnes assuming a specific gravity of 3.0. Reserves for individual magnesite beds are quoted in Table 9, with volume down to 275 m being rounded down to the nearest 100 m^3, and volume/vertical m below 275 m being rounded down to the nearest 10 m^3.

Reserves are geological as there is no allowances for losses in mining and processing, and are classed as <u>Inferred</u>, as thickness of magnesite beds was generally difficult to determine accurately. Reserves are probably conservative as thickness measured in the field was a minimum thickness of subcrop, and softer magnesite may not crop out. Costeaning is required to confirm thickness, and to expose intervening obscured beds.

TABLE 9

INFERRED RESERVES, PROPOSED MINE SITE

BED No.	Strike Length (m)	Average Thickness (m)	To 275 m AHD		Below 275 m AHD		Average %SiO_2	
			(m^3)	(tonnes)	(m^3/vert.m)	(tonnes/vert.m)	Reserve Area	Total Area (if different)
CF11	450	1.0	3 100	9 300	440	1 320	5.1	5.2
CF10E	430	0.5	1 800	5 400	230	690	3.5	
CF10	300	0.6	1 700	5100	220	660	3.5	5.7
CF10W	250	0.5	1 400	4 200	130	390	3.3	
Un-named	200	0.5	900	2 700	90	270		
CF9	450	0.6	2 200	6 600	250	705	3.0	6.5
CF8	450	0.6	2 700	8 100	280	840	4.3	4.9
CF7	330	0.4	1 600	4 800	130	390	3.2	
CF7W	450	0.6	2 600	7 800	250	750	2.7	
CF6	420	0.8	3 700	11 100	340	1 020	2.5	2.7
Un-named	150	0.5	1 100	3 300	70	210	8.8	
CF5	450	2.2	12 700	38 100	990	2 970	3.1	3.7
CF4B	450	0.6	3 300	9 900	260	780	3.1	
CF4A	420	0.4	2 400	7 200	160	480	2.2	2.7
CF4	290	0.8	3 700	11 100	230	690	5.4	6.7
CF3	450	0.8	4 900	14 700	360	1 080	2.3	2.2
CF2	350	0.5	2 100	6 300	180	540	2.0	2.3
CF1	270	0.4	1 500	4 500	110	330	2.6	2.8
Un-named, adjacent to CF1	390	0.2	700	2 100	60	180		
Un-named, adjacent to Marker B'	160	1.2	2 700	8 100	190	570		
W1	450	0.5	2 600	7 800	210	630	2.1	2.8
W2	450	1.2	6 400	19 200	560	1 680	12.2	9.9
W3	400	0.7	3 400	10 200	280	840	13.1	9.4
TOTAL			69 200	207 600	6 020	18 060		

OVERBURDEN RATIOS

Overburden, of dolomite and dolomitic siltstone, to magnesite ratios in the mine site average 7:1, and are derived from surface thickness measured on 4 traverses, from bed W3 to bed CF11 (Table 10).

Overburden: magnesite on the surface near the main costean is slightly higher, due to better exposure, and ratios through the costean are substantially higher, reflecting the increased thickness and number of beds visible in the costean.

TABLE 10
OVERBURDEN TO ORE RATIOS
Magnesite bed W3 east to bed CF11

Location	Ratio
- At Station I.	6.3:1
- Midway between Stations H and I.	7.0:1
- At Station H.	6.7:1
- At Station F.	7.8:1
- Average in reserve area.	7:1
- On surface near costean, bed W2 to CF11.	5.5:1
- Through the costean, bed W2 to CF11.	3.4:1
- Costean only, bed CF4B to CF11 and sequence 23 m east.	2.2:1

SUITABILITY OF CAMEL FLAT MAGNESITE

In Tables 11 to 13, results of analyses for the 95 samples (from 92 sample points plus 3 duplicates) collected in 1984-85 are compared to specifications. A further 12 samples from Parkin (1948), corresponding to beds traced on the surface in 1984-85, are included in Table 11.

WATER FILTRATION (Table 11)

Of the 92 samples collected in 1984-85 (ignoring duplicates), 60 contained less than 4% SiO_2 (the optimum specification), 79 contained less than 6% SiO_2 (the acceptable specification) and 13 contained more than the limit of 6% SiO_2.

Samples from the main costean and nearby are higher in SiO_2% than elsewhere, confirming the high insolubles content reported by Parkin (1948).

SiO_2 content north of Scammell Creek including the mine site does not show consistent trends, and will need to be carefully monitored during mining to avoid localized high silica zones, such as 29.1% and 31.6% SiO_2 in beds W2 and W3 respectively near Station G. Similarly, beds CF4 and CF11 recorded several analyses as high as 11.6% SiO_2.

The area used in reserve calculations can consistently produce magnesite to specificatins. Weighted average in the mine site is 4.7% SiO_2, and only 3.4% SiO_2 if beds W2 and W3 are ignored.

<u>REFRACTORIES AND CHEMICAL USES</u> (Tables 12, 13)

Specifications on a calcined basis include upper limits for SiO_2 and CaO, and lower limits for MgO. Fewer of the 92 samples meet these specifications.

For <u>dead burned refractories</u> (maintenance grade, Table 12) 24 samples met stringent specifications of SiO_2 <8%, and MgO> 88.5% and 54 samples met lower specifications of SiO_2 <8%, MgO >83%. Within the mine site, magnesite beds CF2, 3, 4A, 6, 7W, 9 and 10W consistently met lower specifications and beds CF1, 4B, 10E and W1 were suitable for part of their strike length.

For <u>chemical uses and dead burned brick grade</u> (Table 13), 15 samples met stringent specifications of CaO <3.5%, MgO >83% and 25 met lower specifications of CaO <5.5%, MgO >83%. Only magnesite bed CF6 consistently met lower specifications, with beds CF10E, 9 and 7W suitable for part of their strike length.

High grade magnesite for either refractories or the chemical industry requires selective mining accompanied by detailed sampling.

TABLE 11
SUITABILITY OF RAW MAGNESITE FOR WATER FILTRATION
SiO_2 CONTENT OF RAW MATERIAL

BED NO.	SAMPLING TRAVERSES ACROSS STIKE: COSTEAN 1984-5	COSTEAN 1946-8 (Silicates %)	OPEN CUT 1984	OPEN CUT 1946-8 (Silicates %)	PROPOSED MINE SITE: Stn F	Stn G	Stn H	Between Stn H & Stn I	Stn I	Stn J	Camel Flat Creek
CF11	*	-			*		-	-	**		
CF10E		-			**		**	*			
CF10	-	-			**		**	*			
CF10W		-			**		**	**			
CF9	-	*		*	**			**	**		
CF8	*	-	-	-	**		**	-	*		
CF7		-			**		**				
CF7W		-			**		**	**	**		
CF6	**	*			**		**	**	**		
Un-named							-				
CF5	**	-					**	**	*	*	
CF4B					*		**	**			
CF4A	*				**		**	**			
CF4	-				*		-	*	**		-
CF3	**				**		**	**	**		**
CF2	**				**		**	**	**		*
CF1	**				*		**	**	**		*
Un-named								*			
W1	*				**	**		**		**	**
W2	-				**	-		**		**	*
W3					**	-		**		**	**
W6											*

Blank = not sampled

On raw basis (not calcined):
- \- = SiO_2 > 6% fails specifications.
- * = SiO_2 < 6% marginal.
- ** = SiO_2 < 4% meets specifications.

TABLE 12
SUITABILITY OF MAGNESITE FOR DEAD BURNED REFRACTORIES (Maintenance Grade)
SiO_2 and MgO CONTENT ON CALCINED BASIS

BED NO.	SAMPLING TRAVERSES ACROSS STRIKE							
	COSTEAN	PROPOSED MINE SITE						
		Stn F	Stn G	Stn H	Between Stn H and I	Stn I	Stn J	Camel Flat Creek
CF11	–	–		–	–	**		
CF10E		**		*	–			
CF10	–	–		–	–			
CF10W		*		*	*			
CF9	–	**			**	*		
CF8 (Costean & open cut)	–	*		*	–	–		
CF7		*		–				
CF7W		**		*	**	*		
CF6	**	**		**	**	**		
Un-named				–				
CF5	*			*	*	–	–	
CF4B		–		*	**			
CF4A	*	**		*	*			
CF4	–	–		–	–	**		–
CF3	–	*		**	*	*		**
CF2	**	**		*	*	**		–
CF1	**	–		*	**	*		–
Un-named					–			
W1	–	–	*		**		**	**
W2	–	*	–		*		–	–
W3		*	–		–		*	*
W6								–

Blank = not sampled

On calcined basis: – = SiO_2 > 8% or MgO < 83% fails specifications
* = SiO_2 < 8% and MgO > 83% marginal.
** = SiO_2 < 8% and MgO > 88.5% meets specifications.

TABLE 13
SUITABILITY OF MAGNESITE FOR CHEMICAL USES AND DEAD BURNED BRICK GRADE
MgO and CaO CONTENT ON CALCINED BASIS

BED NO.	SAMPLING TRAVERSES ACROSS STRIKE							
		PROPOSED MINE SITE						
	COSTEAN, & OPEN CUT	Stn F	Stn G	Stn H	Between Stn H & I	Stn I	Stn J	Camel Flat Creek
CF11	** (S)	–		–	–	**		
CF10E		*		*	–			
CF10	–	–		–	–			
CF10W		–	–	–	–			
CF9	–	**			**	–		
CF8 (Costean & open cut)	** (S)	–		–	–	–		
CF7		–		–				
CF7W		*		–	**	–		
CF6	**	**		**	*	*		
Un-named				–				
CF5	–			–	–	–	–	
CF4B		–		–	**			
CF4A	*	–		–	–			
CF4	–	–		–	–	**		–
CF3	–	–		–	–	–		*
CF2	*	**		–	–	–		–
CF1	–	–		–	–	–		–
Un-named					–			
W1	–	–	–		–		–	*
W2	–	–	–		–		–	** (S)
W3		–	–		–		*	–
W6								** (S)

Blank = not sampled

On calcined basis:
- – = MgO < 83% or CaO > 5.5% fails specifications.
- * = MgO > 83% and CaO < 5.5% Dead burned refractories, maintenance grade.
- ** = MgO > 83% and CaO < 3.5% Dead burned refractories, brick grade; and chemical uses.
- (S) = SiO_2 > 8% ; all others SiO_2 < 8%.

SUMMARY

Camel Flat magnesite deposit is 530 km north of Adelaide, and 3 km northwest of Leigh Creek South, near the western margin of the northern Flinders Ranges.

Sedimentary magnesite is confined to Yadlamalka Formation, the upper part of Skillogallee Dolomite, a Late Proterozoic Burra Group metasediment.

Magnesite originally formed as a chemical precipitate in low energy environments on marginal shelves and restricted lagoons, and was then eroded and redeposited as widespread intraformational pelletal conglomerate. Silt and dolomite deposited within the conglomerate matrix form the major impurities. Magnesite interbeds within Skillogalee Dolomite extend from near Leigh Creek South, striking north-northwest for 42 km to Mount Playfair Well.

At Camel Flat, a sequence of approximately 60 magnesite interbeds, ranging in thickness from a few centimetres up to 3 m, extend for 1.5 km along strike within the upper part of Skillogalee Dolomite. Within a central 'main zone' approximately 115 m thick, 25 magnesite interbeds in excess of 0.3 m thick crop out.

Costeans and small open cuts, were dug in the southern part of Camel Flat deposit in the early 1940's by F.H. Faulding and Co Ltd, but magnesite was low grade, with 10 and 20% insolubles based on analyses in 1946-48.

Specifications for magnesite for water treatment in aluminium refineries, a new and important use, require SiO_2 to be less than 6% and preferably less than 4%.

Based on detailed chip sampling in 1984-85, much of the magnesite at Camel Flat will meet these specifications with 60 of the 92 samples containing less than 4% SiO_2, and 79 containing less than 6% SiO_2. The area near the costean on MC1836 contained higher SiO_2 on average than the remainder of the claims.

A proposed mine site between Scammell Creek and Camel Flat Creek, 450 m along strike and 115 m wide, covered by MC1836 and MC1883, contains <u>inferred geological reserves</u> of 207 000 tonnes. Silica content averages 4.7%, and overburden: ore is

7:1. Silica content can be reduced below 4% by selective mining. Inferred reserves below 275 m are 18 000 tonnes per vertical metre.

Comparison of magnesite in outcrop with magnesite exposed in the old costean indicates that more than half the in-situ magnesite does not crop out. Overburden to ore ratio adjacent to the costean was 5.5:1, and 2.2:1 in the costean.

Non outcropping beds of magnesite of unknown grade are expected to persist through the proposed mine site, thereby increasing reserves of magnesite and reducing overburden:ore.

RECOMENDATIONS

Two or three costeans are recommended across strike in the proposed mine site to:

- confirm thickness of individual beds.
- check for variation in composition with depth related to weathering.
- confirm thickness and grade of non-outcropping beds.
- provide bulk samples for industry evaluation.

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SENIOR GEOLOGIST

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APPENDIX A

RESULTS OF ANALYSES, 1984-85

Samples A2813/84 to A2839/84 from AMDEL report AC2688/85 by D. Patterson.

Samples A198/85 to A267/85 from AMDEL report AC4544/85 by D. Patterson.

All results are in percentages
All Fe reported as Fe_2O_3

	A2813 /84	A2814 /84	A2815 /84	A2816 /84	A2817 /84
SiO2	5.65	3.82	3.64	31.4	4.92
TiO2	<0.010	<0.010	<0.010	0.01	0.05
Al2O3	<0.010	0.03	0.05	0.22	0.71
Fe2O3	0.24	0.17	0.13	0.27	0.06
MnO	0.02	0.01	<0.010	0.01	<0.010
MgO	44.5	43.2	44.0	33.0	43.6
CaO	1.37	3.42	2.60	0.44	1.49
Na2O	<0.010	<0.010	0.01	<0.010	<0.010
K2O	<0.050	<0.050	<0.050	<0.050	<0.050
P2O5	0.01	<0.010	<0.010	0.03	<0.010
LOI	47.0	48.1	48.1	34.1	48.0
Totals	98.7	98.7	98.4	99.4	98.8
CO_2	45.0	45.0	45.1	30.3	44.6

	A2818 /84	A2819 /84	A2820 /84	A2821 /84	A2822 /84
SiO2	3.28	29.1	3.56	1.57	1.79
TiO2	<0.010	<0.010	<0.010	<0.010	<0.010
Al2O3	<0.010	0.07	<0.010	<0.010	<0.010
Fe2O3	0.04	1.02	<0.010	0.23	0.48
MnO	<0.010	0.01	<0.010	<0.010	<0.010
MgO	40.3	33.7	44.7	43.8	42.3
CaO	6.75	0.48	2.24	3.40	4.50
Na2O	0.04	<0.010	<0.010	<0.010	<0.010
K2O	<0.050	<0.050	<0.050	<0.050	<0.050
P2O5	0.02	0.02	<0.010	<0.010	<0.010
LOI	48.5	35.6	48.5	49.9	49.6
Totals	98.9	99.9	98.9	98.8	98.6
CO_2	45.2	32.6	46.2	54.1	56.6

	A2823 /84	A2824 /84	A2825 /84	A2826 /84	A2827 /84
SiO2	5.15	1.61	5.10	4.38	1.41
TiO2	<0.010	<0.010	0.02	<0.010	<0.010
Al2O3	<0.010	<0.010	0.28	<0.010	<0.010
Fe2O3	0.34	0.35	0.41	0.24	0.22
MnO	0.02	0.02	0.02	0.01	0.02
MgO	42.6	43.5	39.6	45.1	43.5
CaO	3.84	3.74	7.35	0.60	3.54
Na2O	<0.010	<0.010	0.04	<0.010	<0.010
K2O	<0.050	<0.050	0.08	<0.050	<0.050
P2O5	<0.010	<0.010	0.02	<0.010	<0.010
LOI	47.3	49.8	46.5	48.1	49.9
Totals	99.2	98.9	99.4	98.3	98.5
CO_2	48.8	52.2	48.2	53.2	52.8

	A2828 /84	A2829 /84	A2830 /84	A2831 /84	A2832 /84
SiO2	2.90	2.02	2.32	1.31	11.4
TiO2	<0.010	<0.010	<0.010	<0.010	<0.010
Al2O3	0.07	<0.010	<0.010	<0.010	0.44
Fe2O3	0.19	0.09	0.15	0.21	0.08
MnO	0.02	0.02	0.01	0.02	<0.010
MgO	43.4	44.7	43.4	41.6	33.3
CaO	3.24	2.36	4.04	5.90	11.1
Na2O	<0.010	<0.010	<0.010	<0.010	0.14
K2O	<0.050	<0.050	<0.050	<0.050	0.06
P2O5	<0.010	<0.010	<0.010	<0.010	<0.010
LOI	49.9	49.4	49.1	49.5	41.6
Totals	99.6	98.5	98.9	98.5	98.1
CO_2	53.5	46.7	47.1	47.2	40.9

	A2833 /84	A2834 /84	A2835 /84	A2836 /84	A2837 /84
SiO2	2.72	1.49	4.86	2.06	2.20
TiO2	<0.010	<0.010	<0.010	<0.010	<0.010
Al2O3	<0.010	<0.010	<0.010	<0.010	<0.010
Fe2O3	0.17	0.07	<0.010	<0.010	0.21
MnO	0.01	0.01	<0.010	<0.010	0.01
MgO	45.0	45.2	40.2	44.2	45.8
CaO	1.70	2.32	8.00	4.88	1.40
Na2O	<0.010	<0.010	<0.010	<0.010	<0.010
K2O	<0.050	<0.050	<0.050	<0.050	<0.050
P2O5	0.01	0.01	<0.010	<0.010	<0.010
LOI	48.7	49.1	45.6	47.2	48.7
Totals	98.2	98.1	98.6	98.2	98.2
CO_2	50.8	50.2	48.1	47.3	44.5

	A2838 /84	A2839 /84
SiO2	7.55	16.7
TiO2	<0.010	<0.010
Al2O3	0.20	<0.010
Fe2O3	0.18	0.08
MnO	<0.010	<0.010
MgO	43.8	40.7
CaO	1.01	0.37
Na2O	0.03	0.07
K2O	0.08	<0.050
P2O5	<0.010	<0.010
LOI	45.5	40.7
Totals	98.3	98.5
CO_2	42.1	38.4

A-3

	A198	A199	A200	A201	A202
SiO2	5.65	12.1	4.56	3.40	3.88
TiO2	<0.010	<0.010	<0.010	<0.010	<0.010
Al2O3	<0.010	<0.010	<0.010	<0.010	<0.010
Fe2O3	0.09	<0.010	<0.010	0.08	<0.010
MnO	0.01	<0.010	<0.010	0.01	<0.010
MgO	44.8	39.3	45.9	46.3	43.3
CaO	1.56	3.86	0.35	0.43	3.76
Na2O	0.03	0.46	0.09	0.03	0.04
K2O	<0.050	<0.050	<0.050	<0.050	<0.050
P2O5	<0.010	<0.010	<0.010	<0.010	<0.010
LOI	47.0	43.8	48.2	48.8	47.8
Totals	99.1	99.4	99.0	99.0	98.7
CO_2	45.5	40.3	46.8	47.8	46.8

	A203	A204	A205	A206	A207
SiO2	4.12	7.05	1.92	1.35	1.14
TiO2	<0.010	0.01	<0.010	<0.010	<0.010
Al2O3	<0.010	0.15	0.02	<0.010	<0.010
Fe2O3	0.03	0.03	0.08	0.15	0.23
MnO	0.01	<0.010	0.02	0.01	0.01
MgO	44.8	39.4	40.8	45.3	43.1
CaO	2.12	7.25	7.00	2.20	4.28
Na2O	<0.010	0.04	<0.010	<0.010	<0.010
K2O	<0.050	<0.050	<0.050	<0.050	<0.050
P2O5	<0.010	<0.010	<0.010	<0.010	<0.010
LOI	47.8	44.9	48.7	49.9	49.7
Totals	98.8	98.8	98.5	98.8	98.4
CO_2	46.2	43.7	48.0	47.8	49.0

	A208	A209	A210	A211	A212
SiO2	5.05	14.0	4.46	2.60	2.56
TiO2	<0.010	<0.010	<0.010	<0.010	<0.010
Al2O3	<0.010	<0.010	0.05	<0.010	0.01
Fe2O3	<0.010	0.15	0.26	0.25	0.12
MnO	0.03	<0.010	0.02	0.02	0.01
MgO	40.2	37.7	43.1	44.4	37.7
CaO	6.95	3.92	3.30	2.74	10.6
Na2O	<0.010	<0.010	<0.010	<0.010	0.01
K2O	<0.050	<0.050	<0.050	<0.050	<0.050
P2O5	<0.010	<0.010	<0.010	<0.010	<0.010
LOI	46.4	42.7	47.4	48.9	48.0
Totals	98.5	98.4	98.5	98.8	98.9
CO_2	45.4	41.0	45.6	47.6	45.6

	A213	A214	A215	A216	A217
SiO2	2.00	3.84	2.46	2.90	3.16
TiO2	<0.010	<0.010	<0.010	<0.010	<0.010
Al2O3	<0.010	<0.010	<0.010	<0.010	<0.010
Fe2O3	0.09	0.11	0.04	0.15	0.06
MnO	<0.010	<0.010	<0.010	<0.010	<0.010
MgO	43.5	46.0	41.9	43.0	45.1
CaO	4.22	1.02	5.95	4.54	2.46
Na2O	<0.010	<0.010	0.04	<0.010	<0.010
K2O	<0.050	<0.050	<0.050	<0.050	<0.050
P2O5	<0.010	<0.010	<0.010	<0.010	0.02
LOI	49.1	48.2	48.8	48.6	48.7
Totals	98.8	99.1	99.1	99.1	99.4
CO_2	47.1	48.1	47.5	47.6	47.7

	A218	A219	A220	A221	A222
SiO2	3.64	4.36	1.77	5.55	1.98
TiO2	<0.010	<0.010	<0.010	<0.010	<0.010
Al2O3	<0.010	<0.010	<0.010	0.03	<0.010
Fe2O3	0.26	0.05	0.11	0.14	0.23
MnO	0.01	<0.010	0.01	<0.010	0.02
MgO	45.5	42.1	43.8	35.9	42.5
CaO	1.82	5.20	3.86	11.5	5.25
Na2O	<0.010	<0.010	0.05	0.02	<0.010
K2O	<0.050	<0.050	<0.050	<0.050	<0.050
P2O5	0.03	<0.010	<0.010	0.03	0.03
LOI	48.3	47.3	49.4	45.7	49.1
Totals	99.5	98.9	98.9	98.8	99.0
CO_2	47.7	46.1	48.7	44.7	48.3

	A223	A224	A225	A226	A227
SiO2	1.72	4.86	3.04	3.74	3.90
TiO2	<0.010	<0.010	<0.010	<0.010	<0.010
Al2O3	<0.010	<0.010	<0.010	<0.010	<0.010
Fe2O3	0.31	0.35	0.37	0.41	0.34
MnO	0.01	0.01	<0.010	<0.010	0.04
MgO	45.5	37.6	40.9	44.0	42.7
CaO	1.74	9.65	6.85	3.44	4.36
Na2O	<0.010	0.05	0.04	0.03	0.04
K2O	<0.050	<0.050	<0.050	<0.050	<0.050
P2O5	<0.010	0.02	0.03	0.02	0.03
LOI	49.7	46.3	48.2	48.1	47.6
Totals	98.9	98.8	99.4	99.7	98.9
CO_2	49.7	44.9	47.6	46.9	46.9

	A228	A229	A230	A231	A232
SiO2	7.05	3.36	2.86	2.76	3.06
TiO2	0.02	<0.010	<0.010	<0.010	<0.010
Al2O3	0.31	<0.010	<0.010	<0.010	<0.010
Fe2O3	0.38	0.32	0.18	0.15	0.07
MnO	0.01	0.02	0.01	<0.010	<0.010
MgO	42.2	44.4	41.0	43.6	42.1
CaO	3.84	2.72	6.70	4.12	5.50
Na2O	0.09	<0.010	0.03	<0.010	<0.010
K2O	0.09	<0.050	<0.050	<0.050	<0.050
P2O5	0.04	<0.010	<0.010	0.03	0.02
LOI	45.6	48.9	48.3	48.4	47.8
Totals	99.6	99.6	99.0	99.0	98.5
CO_2	45.3	47.4	46.8	46.9	47.0

	A233	A234	A235	A236	A237
SiO2	3.36	3.68	2.68	8.75	3.22
TiO2	<0.010	<0.010	<0.010	0.03	<0.010
Al2O3	<0.010	<0.010	<0.010	0.55	<0.010
Fe2O3	0.12	0.05	0.28	0.20	0.07
MnO	<0.010	<0.010	0.01	<0.010	0.01
MgO	41.7	43.0	46.0	39.6	41.7
CaO	6.55	5.00	1.63	5.70	6.40
Na2O	<0.010	<0.010	<0.010	0.19	<0.010
K2O	<0.050	<0.050	<0.050	0.15	0.05
P2O5	<0.010	0.02	0.01	0.04	0.02
LOI	47.8	47.7	49.3	44.5	47.7
Totals	99.4	99.4	99.8	99.7	99.1
CO_2	47.4	47.2	48.3	42.9	45.7

	A238	A239	A240	A241	A242
SiO2	2.80	2.66	7.50	2.18	1.98
TiO2	<0.010	<0.010	<0.010	<0.010	<0.010
Al2O3	<0.010	<0.010	0.08	<0.010	<0.010
Fe2O3	0.07	0.13	0.05	0.20	0.20
MnO	<0.010	<0.010	<0.010	0.01	0.01
MgO	44.5	43.2	36.1	44.9	45.3
CaO	3.40	4.70	10.8	3.20	2.72
Na2O	<0.010	0.02	0.02	<0.010	<0.010
K2O	<0.050	<0.050	<0.050	<0.050	<0.050
P2O5	0.02	<0.010	0.03	0.03	<0.010
LOI	48.2	48.4	43.9	49.2	49.7
Totals	98.9	99.0	98.4	99.6	99.8
CO_2	47.2	47.3	42.3	47.3	47.4

	A243	A244	A245	A246	A247
SiO2	2.22	6.60	4.52	5.05	1.91
TiO2	0.01	0.02	<0.010	<0.010	<0.010
Al2O3	<0.010	0.22	<0.010	<0.010	<0.010
Fe2O3	0.36	0.40	0.34	0.14	0.11
MnO	0.01	0.01	0.02	<0.010	<0.010
MgO	42.5	41.0	42.9	38.3	42.4
CaO	5.50	5.35	4.64	9.30	5.90
Na2O	0.03	0.06	<0.010	0.02	<0.010
K2O	0.06	0.10	0.06	0.05	0.06
P2O5	0.03	0.04	0.02	0.02	0.03
LOI	49.2	46.0	47.0	46.2	48.6
Totals	99.9	99.8	99.5	99.1	99.0
CO_2	47.6	44.0	46.3	45.1	48.2

	A248	A249	A250	A251	A252
SiO2	2.44	6.60	1.53	2.04	1.93
TiO2	<0.010	0.03	<0.010	<0.010	<0.010
Al2O3	<0.010	0.19	<0.010	<0.010	<0.010
Fe2O3	0.08	0.08	0.03	0.22	0.08
MnO	<0.010	<0.010	<0.010	0.01	<0.010
MgO	46.4	37.7	46.6	45.7	43.9
CaO	1.68	9.65	1.54	2.06	4.80
Na2O	<0.010	0.03	<0.010	<0.010	<0.010
K2O	0.05	0.14	<0.050	<0.050	<0.050
P2O5	0.05	0.02	0.02	0.02	0.01
LOI	49.0	44.6	49.8	49.3	49.1
Totals	99.7	99.0	99.4	99.3	99.7
CO_2	49.0	44.4	49.8	49.0	48.9

	A253	A254	A255	A256	A257
SiO2	1.95	2.22	5.50	2.72	1.99
TiO2	<0.010	<0.010	<0.010	<0.010	<0.010
Al2O3	<0.010	<0.010	<0.010	<0.010	<0.010
Fe2O3	0.09	0.08	0.02	0.18	0.27
MnO	<0.010	<0.010	<0.010	0.01	0.01
MgO	46.4	44.2	39.8	41.8	43.9
CaO	1.72	3.58	8.10	5.95	4.06
Na2O	<0.010	<0.010	<0.010	0.02	<0.010
K2O	<0.050	<0.050	<0.050	<0.050	<0.050
P2O5	<0.010	<0.010	0.02	0.02	0.01
LOI	49.5	49.0	46.0	48.4	49.1
Totals	99.6	99.0	99.4	99.0	99.3
CO_2	47.4	45.7	45.4	44.5	47.4

	A258	A259	A260	A261	A262
SiO2	1.65	6.10	1.43	3.78	3.68
TiO2	<0.010	0.03	<0.010	<0.010	<0.010
Al2O3	<0.010	0.21	<0.010	<0.010	<0.010
Fe2O3	0.30	0.68	0.16	0.03	0.11
MnO	0.01	0.02	<0.010	<0.010	<0.010
MgO	43.8	42.8	44.6	44.2	41.6
CaO	3.82	3.22	2.94	3.10	5.45
Na2O	0.02	0.10	<0.010	<0.010	0.03
K2O	<0.050	<0.050	<0.050	<0.050	0.06
P2O5	<0.010	0.01	0.02	0.03	0.02
LOI	50.2	46.8	50.2	48.3	48.2
Totals	99.7	99.9	99.3	99.3	99.1
CO_2	**48.5**	**44.6**	**48.4**	**47.2**	**47.0**

	A263	A264	A265	A266	A267
SiO2	2.02	2.78	4.78	2.50	4.82
TiO2	<0.010	<0.010	0.01	<0.010	<0.010
Al2O3	<0.010	<0.010	0.01	<0.010	<0.010
Fe2O3	0.26	0.07	0.09	0.04	0.06
MnO	0.01	<0.010	<0.010	<0.010	<0.010
MgO	44.1	44.1	38.2	42.9	40.8
CaO	1.72	3.70	8.10	3.52	6.45
Na2O	<0.010	<0.010	<0.010	<0.010	<0.010
K2O	<0.050	<0.050	<0.050	<0.050	<0.050
P2O5	<0.010	<0.010	0.02	<0.010	<0.010
LOI	50.0	49.1	47.1	49.2	47.3
Totals	98.0	99.7	98.2	98.1	99.3
CO_2	**48.9**	**47.6**	**45.6**	**48.5**	**46.1**

APPENDIX B

PETROLOGICAL DESCRIPTION, SAMPLE RS318

FROM AMDEL REPORT G6226/85

Sample 6536 RS 318; TSC44127

Rock Name:
Dolomite

Hand Specimen:
A very fine grained, dull white rock with well developed stylolites producing a fibrous texture on the weathered surface.

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

	%
Dolomite	90
Muscovite	9
Opaques and semi-opaques	1

This sample is comprised mainly of very fine grained dolomite which has a fragmental texture. Most of the dolomite forms subangular to angular clasts up to 3 mm wide which are separated by very finely granular, turbid micritic dolomite and muscovite/sericite. The dolomite clasts have a very fine grain size and locally have a turbid character. Some of the dolomite clasts contain concentrations of elongate, acicular muscovite flakes which generally exhibit a random orientation. The interstitial muscovite tends to form fibrous aggregates with a well developed foliation. Some of the interstitial muscovite forms very well developed stylolites which produce the fibrous texture noted in hand specimen.

Minor amounts of opaque to translucent iron oxides form small disseminated grains and aggregates as well as very narrow fracture linings.

This is a fragmental rock containing angular dolomite clasts cemented by muscovite and minor micritic dolomite.

APPENDIX C

LOG OF NO 1 BORE, AND ANALYSES FROM PARKIN, 1948

LOG OF NO 1 BORE, AND CORRELATION WITH MAIN COSTEAN

No. 1 BORE			SURFACE	
Dolomite	Magnesite	Width in Bore	Width in Costean	Seam No.
0-0.56				
	0.56-0.99	0.43	0.46	2
0.99-1.83				
	1.83-2.59	0.76	0.38	3
2.59-2.74				
	2.74-3.30	0.56	0.53	4
3.30-3.66				
	3.66-4.57	0.91	0.48	5
4.57-6.55				
	6.55-6.83	0.28	0.38	6
6.83-11.89				
	11.89-12.42	0.53	0.53	7
12.42-12.95				
	12.95-14.43	1.48	1.48	8
14.43-18.82				
	18.82-19.51	0.69	0.71	9
19.51-21.18				
	21.18-22.25	1.07	1.02	10
22.25-23.01				
	23.01-23.72	0.71	0.91	11
23.72-24.84				
	24.84-26.21	1.37	1.34	12
26.21-26.67				
	26.67-27.33	0.66	0.51	13
27.33-30.38				
	30.38-31.39	1.01	1.52	14
31.39-31.55				
	31.55-32.31	0.76	0.89	14A
32.31-34.14				
	34.14-34.75	0.61	0.64	14
34.75-35.51				
	35.51-36.12	0.61	1.34	15A
36.12-37.03				
	37.03-37.34	0.31	0.31	16
37.34-38.71				
	38.71-39.22	0.51	0.51	17
39.22-41.71				
	41.71-42.27	0.56	0.64	18
42.27-43.94				
	43.94-45.01	1.07	1.22	19
45.01-46.56				
	46.56-47.17	0.61	0.46	20
47.17-50.14				
	50.14-51.05	0.91	0.99	21
51.05-52.88				
	52.88-53.34	0.46	0.48	22
53.34-56.85				
	56.85-57.61	0.76	0.69	23
57.61-59.61				
	59.61-59.97	0.36	0.41	24
59.97-60.53				
	60.53-61.0	0.48	0.43	25
61.0	End of Hole.			

ANALYSES FROM MAIN COSTEAN, MC1836, FROM PARKIN, 1948

Location	Bed No (Parkin)	ANALYSES, % Insolubles	CaO	MgO	Width of Bed (m)	Equivalent Bed No 1984-5
Costean	C. 03	25.1			0.46	
Costean	C. 02	13.6			0.76	
Costean	C. 01	12.0			0.36	
Costean	C. 0	9.9			0.61	
Costean	C. 1	17.7			0.97	
Costean	C. 2	13.7			0.46	
No 1 Bore	C. 2	11.2	5.9	36.3	0.43	
Costean	C. 3	14.5			0.38	
No 1 Bore	C. 3	10.7	1.1	41.7	0.76	
Costean	C. 4	20.0			0.53	
No 1 Bore	C. 4	22.1	6.2	30.9	0.56	
Costean	C. 5	19.1			0.48	
No 1 Bore	C. 5	16.9	1.5	37.8	0.91	
Costean	C. 6	16.0			0.38	
No 1 Bore	C. 6	15.2	2.7	36.9	0.28	
Costean	C. 7	12.6			0.53	
No 1 Bore	C. 7	12.4	4.5	36.3	0.53	
Costean	C. 8	14.9			1.48	CF11
No 1 Bore	C. 8	12.5	2.3	38.7	1.48	CF11
A198/85 (costean)	C. 8	8.4	1.6	45.2	–	CF11
Costean	C. 9	11.5			0.71	CF10E
No 1 Bore	C. 9	10.8	0.3	41.7	0.69	CF10E
Costean	C. 10	19.2			1.02	CF10
No 1 Bore	C. 10	19.1	4.2	33.8	1.07	CF10
A199/85 (costean)	C. 10	15.8	3.9	39.5	–	CF10
Costean	C. 11	19.4			0.91	CF10W
No 1 Bore	C. 11	23.9	3.5	33.2	0.71	CF10W
Costean	C. 12	13.9			1.34	
No 1 Bore	C. 12	13.8	2.6	38.1	1.37	
No 2 Bore	Q. 12	11.6	5.8	38.5	–	
Costean	C. 13	5.8	0.1	45.7	0.51	CF9
No 1 Bore	C. 13	6.3	7.5	36.9	0.66	CF9

Location	Bed No (Parkin)	ANALYSES, % Insolubles	CaO	MgO	Width of Bed (m)	Equivalent Bed No 1984-5
A2839/84	C. 13	21.7	0.4	41.3	-	CF9
Quarry	Q. 13	4.7	0.8	45.7		CF9
Costean	C. 14	11.5	3.7	39.1	1.52	CF8
No 1 Bore	C. 14	12.1	3.3	38.2	1.01	CF8
A200/85 *(costean)*	C. 14	6.2	0.4	46.3	-	CF8
Quarry	Q. 14	15.2	2.0	39.0	-	CF8
A2838/84 *(costean)*	Q. 14	16.3	1.0	44.5	-	CF8
Costean	C. 14A	9.4	1.1	42.8	0.89	
No 1 Bore	C. 14A	9.6	0.8	42.1	0.76	
Quarry	Q. 14A	6.2	0.1	45.6		
Costean	C. 15	19.0	1.3	37.0	0.64	
No 1 Bore	C. 15	12.0	7.8	35.5	0.61	
Costean	C. 15A	9.6	1.9	41.9	1.34	CF7
No 1 Bore	C. 15A	27.1	4.0	30.7	0.61	CF7
Costean	C. 16	16.9			0.31	CF7W
No 1 Bore	C. 16	70.0	2.0	8.6	0.31	CF7W
Costean	C. 17	14.1			0.51	
No 1 Bore	C. 17	12.1	4.2	38.7	0.51	
Costean	C. 18	19.9			0.64	
No 1 Bore	C. 18	18.5	2.0	34.9	0.56	
Costean	C. 19	4.9	0.7	45.1	1.22	CF6
No 1 Bore	C. 19	14.4	3.3	37.4	1.07	CF6
A201/85	C. 19	4.7	0.4	46.8	-	CF6
Costean	C. 20	15.3			0.46	
No 1 Bore	C. 20	17.7	5.7	33.3	0.61	
Costean	C. 21	14.4			0.99	
No 1 Bore	C. 21	14.3	2.0	38.3	0.91	
Costean	C. 22	19.2			0.48	
No 1 Bore	C. 22	16.3	6.1	38.0	0.46	
Costean	C. 23	8.0	3.4	41.8	0.69	CF5
No 1 Bore	C. 23	7.0	4.8	39.8	0.76	CF5
A202/85	C. 23	5.7	3.8	43.9	-	CF5

Location	Bed No (Parkin)	ANALYSES, % Insolubles	CaO	MgO	Width of Bed (m)	Equivalent Bed No 1984-5
Costean No 1 Bore	C. 24 C. 24	9.9 16.0	3.7 4.6	39.3 35.0	0.41 0.36	
Costean No 1 Bore	C. 25 C. 25	9.8 20.2	0.8 2.0	43.7 36.0	0.43 0.48	
Costean	C. 26	8.5	1.4	44.2	0.91	CF4B

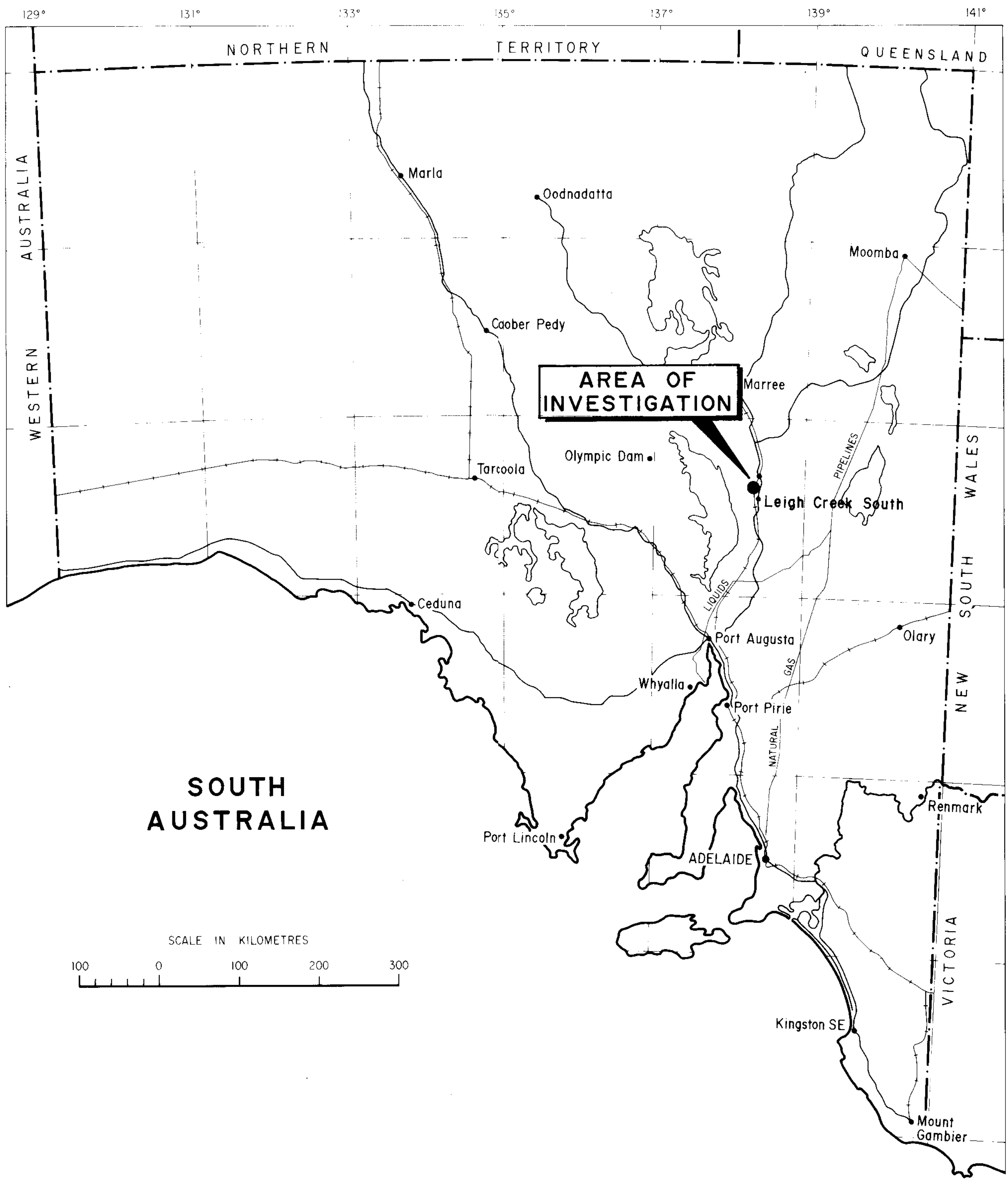
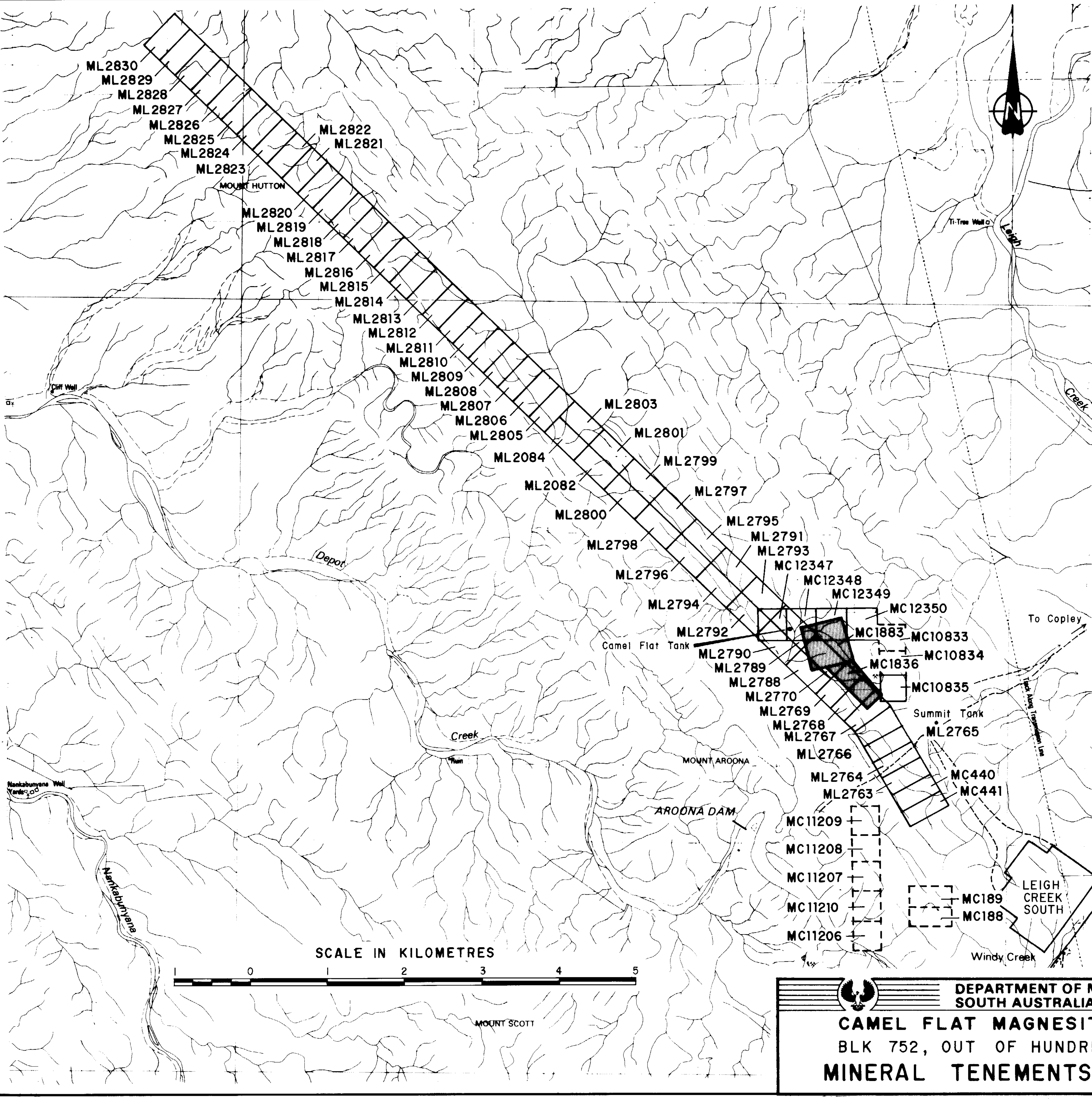


FIG. I

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED W. McC.	30·4·86 C.D.O. DATE
CAMEL FLAT MAGNESITE DEPOSIT BLK 752, OUT OF HUNDREDS (COPLEY) **LOCALITY PLAN**	DRAWN R. Bird DATE Dec '85 CHECKED	SCALE As shown PLAN NUMBER S18526



LEGEND

MC1883	Mineral Tenement without production
ML2801	Mineral Tenement with production

Note: Locations of MC188 to MC189 and MC11206 to MC11210 are uncertain.

FIG. 2

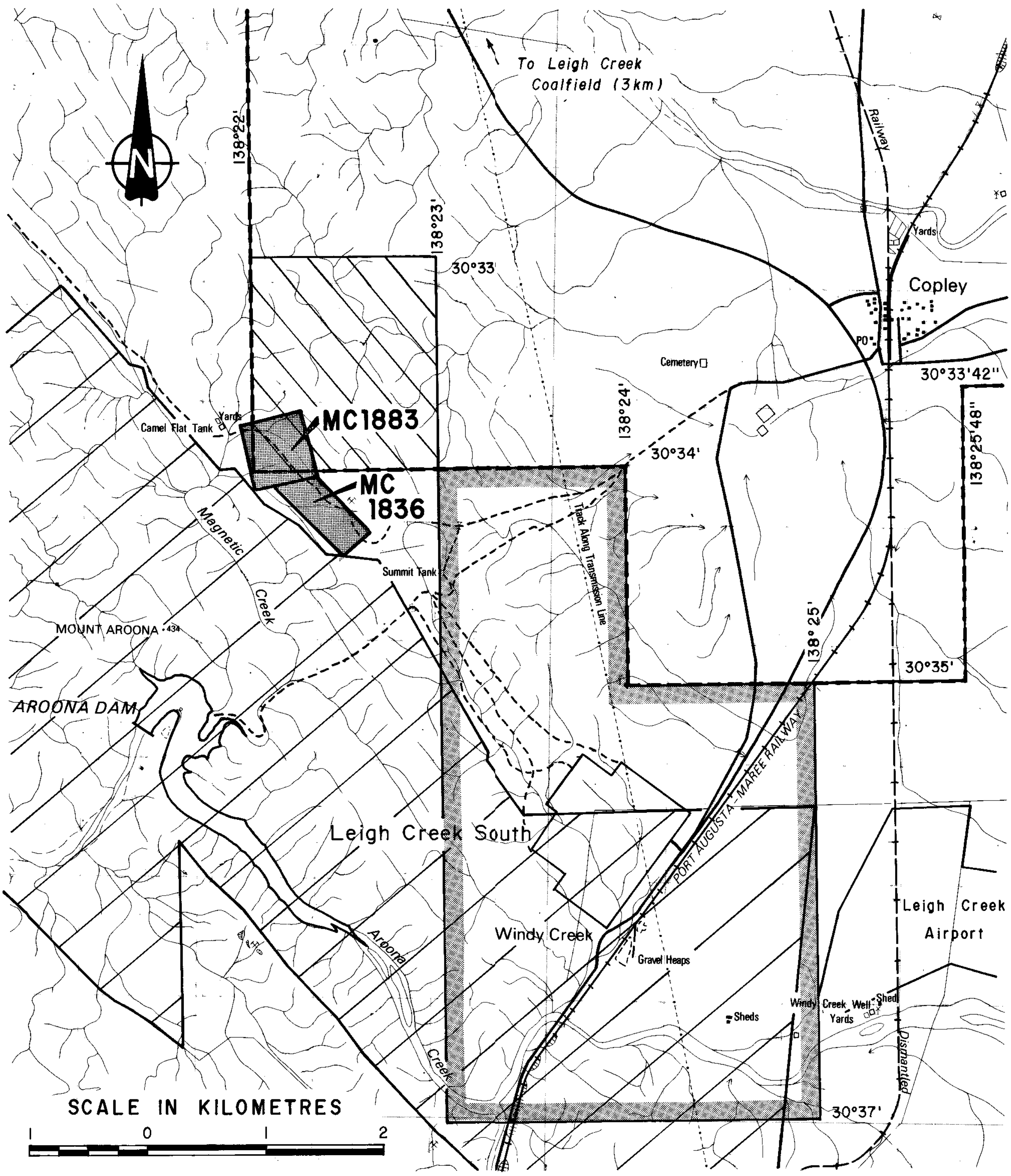
DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

CAMEL FLAT MAGNESITE DEPOSIT
BLK 752, OUT OF HUNDREDS (COPLEY)

MINERAL TENEMENTS 1918 - 1962

COMPILED P.P.C.	CDO	DATE 30-4-86
DRAWN R. Bird	SCALE 1:50000	
DATE Feb. 86	PLAN NUMBER	
CHECKED	86-64	

3938



LEGEND

Reserved from Mining Act, 14/2/74, Leigh Creek Coalfield	ETSA Reserve, Aroona Dam.
Reserved from Mining Act, 22/6/78, Leigh Creek South Township.	Area made available for mining, 29/10/84

FIG. 3

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

CAMEL FLAT MAGNESITE DEPOSIT
BLK 752, OUT OF HUNDREDS (COPLEY)
MINERAL TENURE, 1984 & 1985

COMPILED W. McC.	C.D.O.	30·4·86 DATE
DRAWN R. Bird	SCALE 1:50000	
DATE Feb. 86	PLAN NUMBER	S18527
CHECKED		

3938

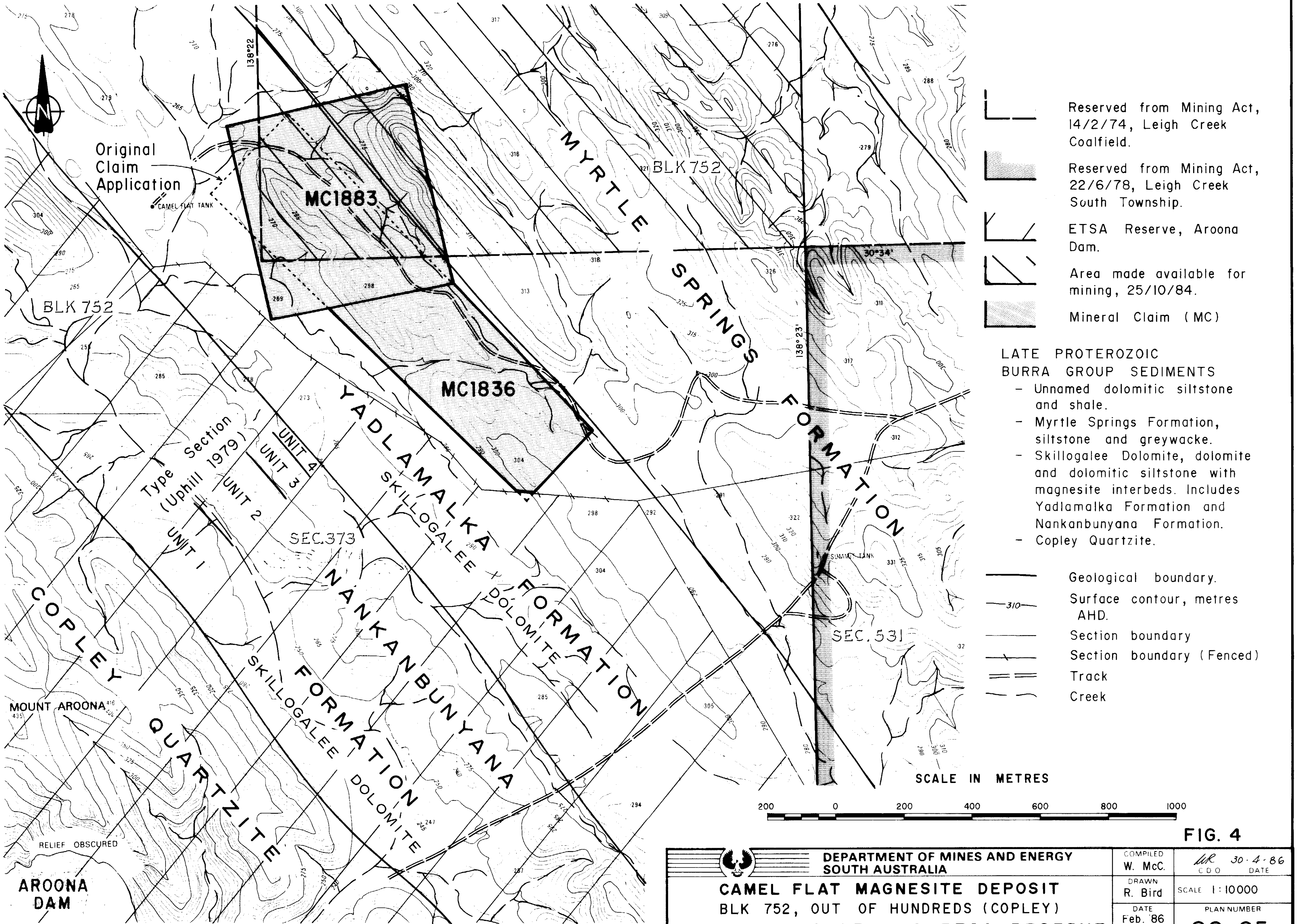


FIG. 4

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED W. McC.	CDO 30·4·86 DATE
CAMEL FLAT MAGNESITE DEPOSIT BLK 752, OUT OF HUNDREDS (COPLEY)	DRAWN R. Bird	SCALE 1:10000
GEOLOGICAL SETTING & ETSA RESERVE	DATE Feb. '86 CHECKED	PLAN NUMBER 86-65

3938

REFERENCE

LATE PROTEROZOIC
BURRA GROUP

MYRTLE SPRINGS FORMATION
Grey and green siltstone and greywacke, minor dolomite and quartzite.

SKILLOGALLEE DOLOMITE, YADLAMALKA FORMATION
Dark grey dolomite and silty dolomite

Pelletal magnesite interbeds with thickness in metres, with interbed numbers W1 to W6 and CF1 to CF11 and thickness in metres.

Prominent interbeds of dolomite, sandy dolomite, ferruginous dolomite, and stromatolitic dolomite, used as marker beds as follows:

Marker F, prominent massive dolomite, 2m to 4m thick.
Marker E, low subcrop of hard light grey fissile dolomite, 0·3m thick.
Marker D', light brown ferruginous sandy dolomite, 0·1m thick.
Marker D, hard dark grey dolomite, 0·3m thick, some irregular ferruginous stromatolitic dolomite.
Marker C, hard dark grey or brown ferruginous stromatolitic dolomite, 0·3m thick.
Marker B', hard dark grey or brown ferruginous dolomite, 0·5m thick.
Marker B, hard dark grey fissile dolomite, 1m thick, overlain by 0·3m brown ferruginous dolomite.
Marker A, hard dark grey fissile dolomite, < 1·5m thick.
Marker Z, prominent massive dolomite 0·5m thick, saw tooth outcrop.
Marker W, prominent massive dolomite, 3m to 4m thick.

F 0·6 Fault with displacement in metres and direction
Fault breccia
73 Dip and strike of bedding
Creek
295 Surface contour, metres AHD
Track
Open cut, Costean
Claim/Lease corner posts
Fenced Boundary
STN A Survey station
Sampling traverse
Area used in reserve calculations

SCALE IN METRES

20 0 20 40 60 80 100

FIG. 5

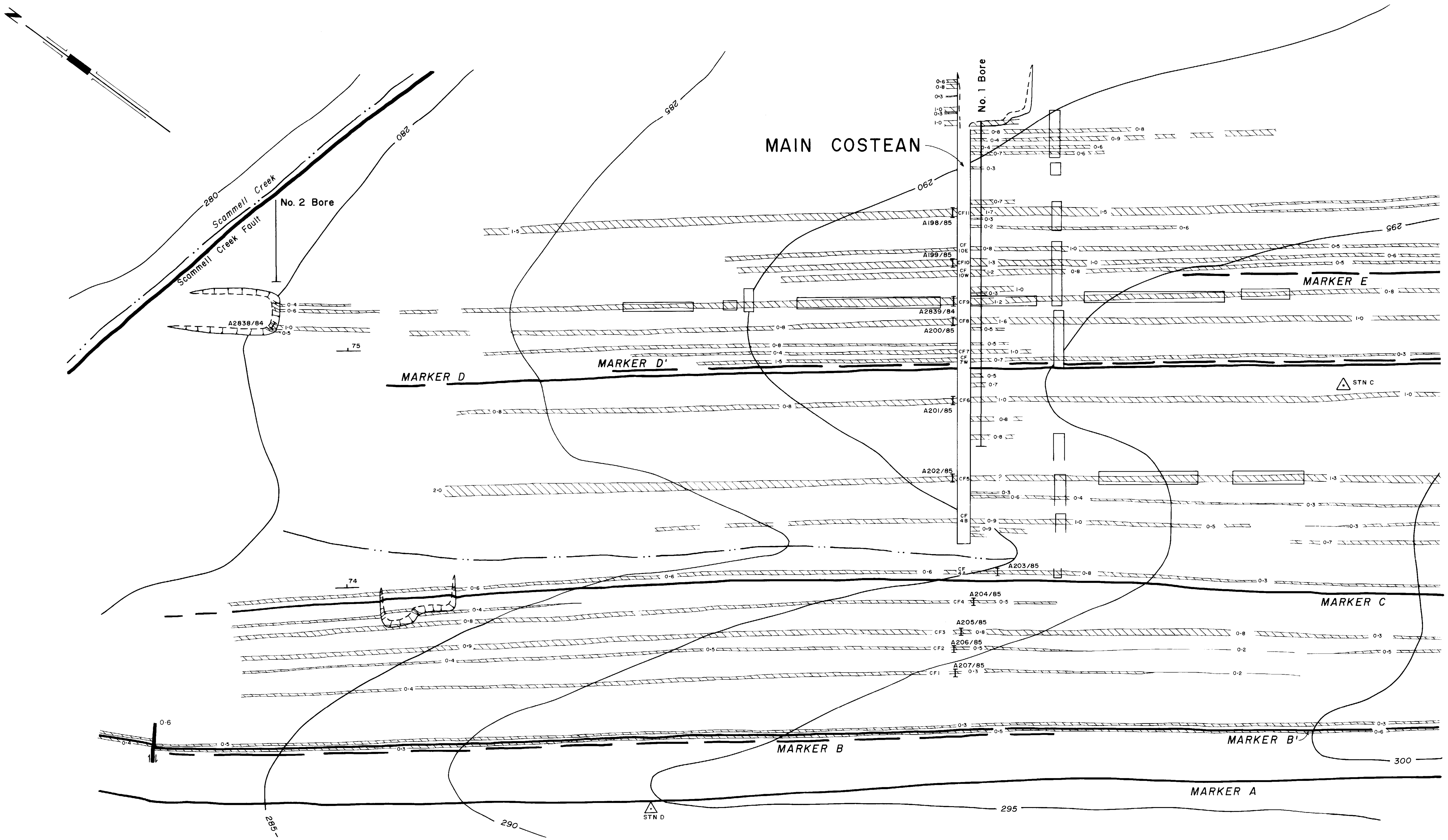
DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

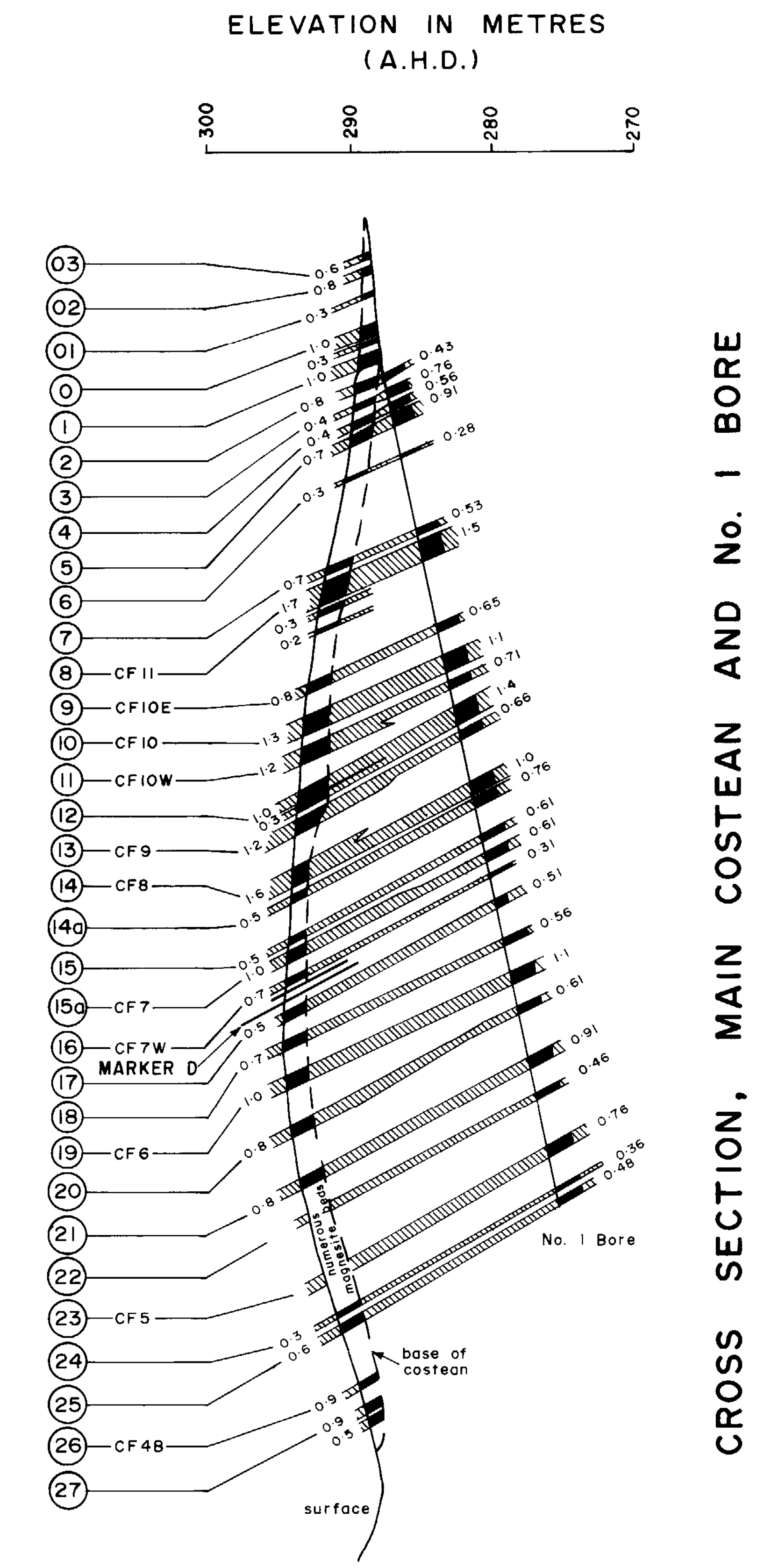
CAMEL FLAT MAGNESITE DEPOSIT

BLK 752, OUT OF HUNDREDS (COPLEY)

SITE GEOLOGY OF MC1836 & MC1883

COMPILED W. McCallum
DRAWN R. Bird
DATE December '85
CHECKED
C.D.O. DATE 30·4·86
SCALE 1:1000
PLAN NUMBER 86-66





REFERENCE

Magnesite in costean or bore-hole with thickness in metres

Inferred correlation

CF4B to CF11 — Numbered magnesite interbeds mapped in 1984-85

03 to 27 — Magnesite interbeds numbered by Parkin (1948)

SCALE IN METRES

10 0 10 20 30 40 50

REFERENCE

LATE PROTEROZOIC BURRA GROUP

SKILLOGALLEE DOLOMITE-YADLAMALKA FORMATION

Dark grey dolomite and silty dolomite

Pelletal magnesite interbeds with thickness in metres, magnesite beds CF1 to CF11

Prominent interbeds of dolomite, sandy dolomite, ferruginous dolomite, and stromatolitic dolomite, used as marker beds as shown.

Marker E, low subcrop of hard light grey fissile dolomite, 0·3m thick.

Marker D', light brown ferruginous sandy dolomite, 0·1m thick.

Marker D, hard dark grey dolomite, 0·3m thick; some irregular ferruginous stromatolitic dolomite.

Marker C, hard dark grey or brown ferruginous stromatolitic dolomite, 0·3m thick.

Marker B', hard dark grey or brown ferruginous dolomite, 0·5m thick.

Marker B, hard dark grey fissile dolomite, 1m thick, overlain by 0·3m brown ferruginous dolomite.

Marker A, hard dark grey fissile dolomite, < 1·5m thick.

Creek

295 — Surface contour, metres AHD

Open cut

STN D — Survey station

Costean

F 0·6 — Fault with displacement in metres and direction

74 — Dip and strike of bedding

Trace of borehole projected to surface.

FIG. 6

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA

CAMEL FLAT MAGNESITE DEPOSIT

BLK 752, OUT OF HUNDREDS (COPLEY)

MAIN COSTEAN, MC 1836

SITE GEOLOGY AND SECTION

COMPILED	W. McCallum
DRAWN	R. Bird
DATE	November 85
CHECKED	
C.D.O.	30·4·86 DATE
SCALE	1:500
PLAN NUMBER	86-67

3938

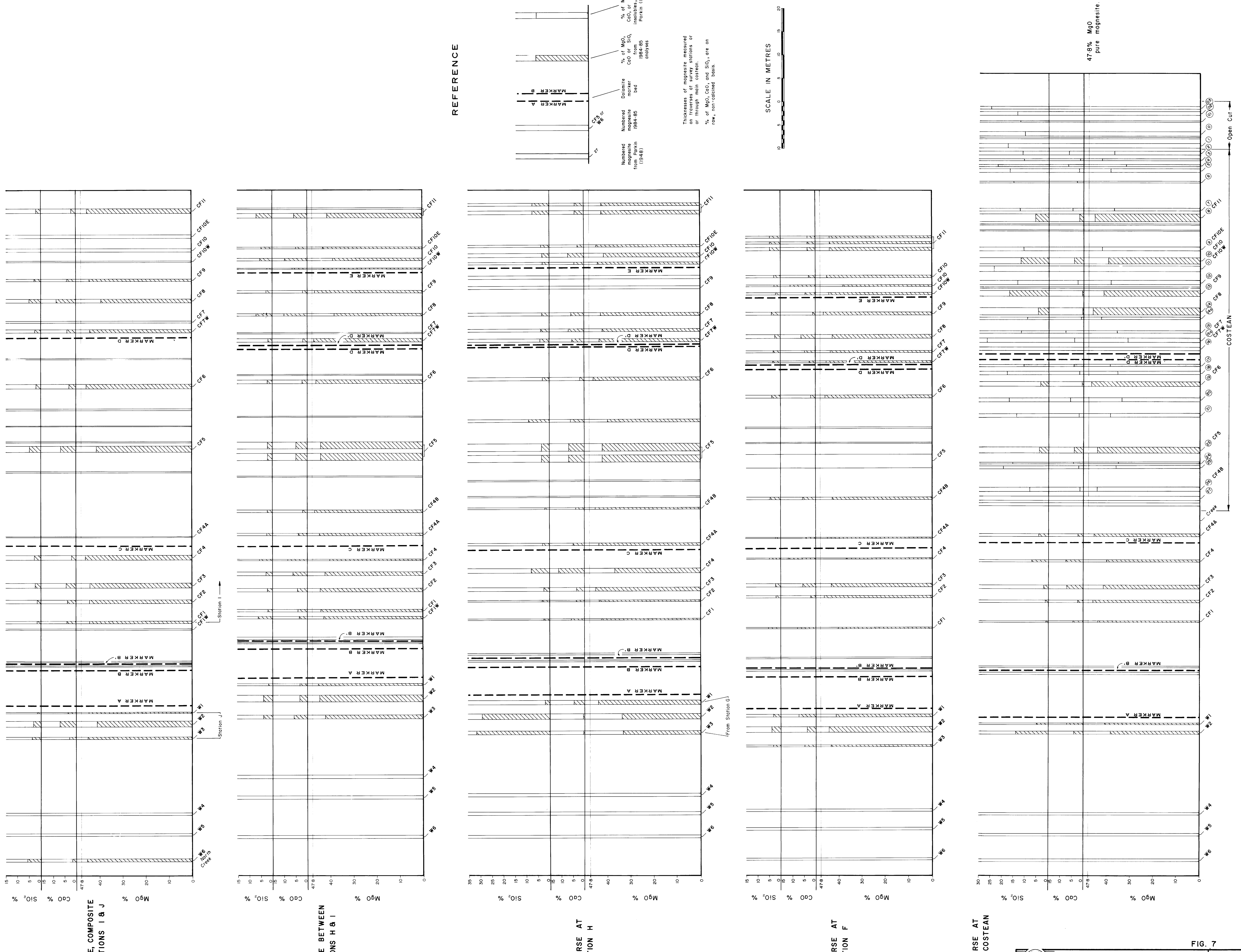


FIG. 7

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

CAMEL FLAT MAGNESITE DEPOSIT

BLK 752, OUT OF HUNDREDS (COPLEY)

HISTOGRAM OF MgO, CaO AND SiO_2 %
MC 1836, 1883

COMPILED	W. McCallum
DRAWN	R. Bird
DATE	November 85
CHECKED	C.D.O. 30.4.86
SCALE	
PLAN NUMBER	86-68