DEPARTMENT OF MINES
SOUTH AUSTRALIA

Report on

HEMATITE DEPOSIT

SECTION 5, HUNDRED OF CAMPOONA

by

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Geologist
IRON SECTION

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APPENDICES

MAP REFERENCE

No.	Title	Scale
58-244	Hematite Deposits Section 5, Hd. of Campoona Geological Plan	200' = 1" 40 chns = 1" 1 mile = 1"

Rept. Bk. No. 47/80
G.S. No. 1149
D.M. No. 688/58

15th September, 1958.

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HEMATITE DEPOSIT

SECTION 5, HUNDRED OF CAMPOONA

ABSTRACT

Two high grade hematite orebodies reported by R.L. Jack (Bulls. 3 and 9, Geological Survey of S.A.) were located and mapped on Section 5, Hundred of Campoona. Samples were taken for petrological examination and assay. No further action is recommended at this stage.

INTRODUCTION

The area was mapped by plane table using a scale of 200' = 1" to determine the relationship between the hematite and the surrounding sandstones. This mapping was carried out during the period 26/5/58 - 7/7/58.

LOCATION

The orebody is situated on Section 5, Hundred of Campoona approximately 14 miles by road N.W. of Cleve. It lies along the crest of a series of low rolling hills which are typical of the area, and which support only low mallee and scrub much of which has been logged and burnt in preparation for cultivation.

TITLE

Section 5, Hundred of Campoona is held by Mr. Kruger, farmer of Gum Flat, leasehold with mineral rights reserved to the crown. Several mining leases and claims have been held on parts of the section, but none are current.

Previous claims & leases

Claim No.	Lease No.	Holder	Period	Docket No.
10862	2333	Gerald Gillen	3/7/18-30/6/23	840/23
10863	2334	Daniel Lorenzo	3/7/18-30/6/23	"
10864	2335	T.A. McEwin	3/7/18-30/6/23	"
10865	2336	Floyd Barratt	3/7/18-30/6/23	"
10866	2337	Alfred Scurry	3/7/18-30/6/23	"
15524		Phillip J.A. Plummer	20/2/37-4/2/38	354/37
15912		" "	25/2/38-18/2/44	113/38

Section 5, Hundred of Campoona is excluded from the operation of the Mining Act.

PREVIOUS REPORT

The prospect is referred to briefly by R.L. Jack (Bulletins 3 and 9, Geological Survey of S.A.)

PREVIOUS EXPLORATION

During 1937 exploration work was carried out on behalf of P.J.A. Plummer, but some work apparently preceded this date as R.L. Jack mentions some shallow cuttings in Bulletin 9 (1922). Two shafts, an adit and numerous costeans large and small have been constructed, the shafts in the ore body are now 7' and 20' in depth but may have been deeper. The adit is in the ore and is approximately 20' long but is now largely collapsed; the costeans, the largest of which is greater than 50' in length, have been placed rather haphazardly, some being up to 50' distant from the steeply dipping orebody, and others along the strike.

GEOLOGY

Regional Geology

In the regional geology of the area 3 major rock types have been distinguished by R.K. Johns (Rudall 4 mile - 1" sheet 1957).

Of these, two, the gneiss group and the schist group make up the Archaean basement complex in the area. The gneiss group consists of undifferentiated quartz felspar gneisses and metasediments with minor quartzites, schists, amphibolites, migmatites, pegmatites and dolomites. The schist group consists of undifferentiated mica schists with minor quartzites, amphibolites, graphite schists, micaceous quartzites, quartz felspar gneisses and pegmatites with associated hematite quartzites, quartzites, cherts and dolomites. The third major group is made up of conglomerate, grits and sandstones of early Palaeozoic, possibly Cambrian age? The Archaean complex lies approximately 1 mile to the east of Section 5 and forms folded synclines and anticlines striking approximately N.E. - S.W. with dips from 50° - 80° (Rudall Sheet). The sandstones and conglomerates overly the Archaean complex striking N.W. and dip approximately 15° - 40° S.W. In the area mapped the contact between the two was not seen.

Detailed Geology

The hematite orebody mapped on Section 5, Hundred of Campoona occurs completely within the conglomerate sandstone group and strikes E - W with dips steeply (80°) to the north and minor local variations to 50°N. The hematite is found to occur in a shear zone over a strike length of 3,600'. In a costean 30' E of BA2.0 (Map Reference No. 58-244) a very fine crushed zone 1' wide (now largely replaced by hematite) is found to occur at the contacts of the ore with the hanging and footwalls. (Appendix Petrological Report Sample 3, P666/58). On the western edge of the area mapped, the shear zone is found to continue with only

minor limonite mineralisation (Petrological report Sample II P665/58) The hematite ore zone consists mainly of nearly pure hematite enclosing lenses of quartz sandstone with hematitic cement. The hematite is of two types (1) dull earthy botryoidal and (2) bright grey metallic botryoidal. Samples V & VI of the petrological report represent these type which have a similar structural environment. The lenses of sandstone are represented by sample I of the petrological report and are found to consist essentially of quartz and minor felspar grains cemented by colliform hematite.

In the shaft nearest B.A. 4.2 the colliform bands of hematite are parallel to the dip of the orebody giving a type of pseudo-bedding. Also in this shaft minor drag folding occurs which indicates a downthrow on the northern side suggesting a normal type fault. No lateral movement could be determined.

From the petrological report two possible origins for the hematite can be inferred:

(1) That it has been formed by ascending or descending meteoric waters carrying iron which has found the crushed zone of the shear favourable for the deposition of the iron, or,

(2) That ascending hydrothermal solutions carrying iron may have moved up from the underlying basement rocks along the line of weakness of the shear zone possibly during a pegmatite phase and deposited the iron in available open spaces.

Economic Geology

The mapping has disclosed two separate and parallel bodies of high grade iron ore, the larger averaging ten feet in width over a strike length of approximately 3600 feet of which 1700 feet is outcrop. The second similar but smaller body is approximately 600 feet in length, up to two feet in width and three-quarters of a mile to the north of the former. The larger orebody would contain possibly 1,700,000 cub. feet of ore per 100 feet in depth.

The two costean samples which were taken two feet into the hanging wall and foot wall of the larger orebody have an assay average of 37.5% Fe. This would have been considerably higher had the wall rock not been included in the assay. A sample taken over a 6 foot wide outcrop assayed 55% Fe (A929/58 Appendix). The pure botryoidal hematite assays 66% Fe while the impregnated sandstone of the hanging wall on the eastern end of the orebody assays 18.6% over a width of 8 ft. Assuming 8 cub. feet of ore/ton the above figure of volume for the larger orebody is equivalent to 212,000 tons/100 feet in depth.

A spectrographic analysis was also carried out on a costean sample to determine the elements present with particular reference to gold. No gold was detected in this analysis but it was detected in minor quantities in three assays and also seen in one petrological sample.

CONCLUSION

From detailed mapping of the iron deposits, Section 5, Hundred of Campoona, two high grade hematite orebodies have been defined and their relationship to the surrounding rocks established. The deposits are relatively small and no further work is recommended at this stage. Some sections of the orebody could possibly be utilised for the recovery of red ochre.

W.R. Appleby
Geologist
IRON SECTION

WRA:AGK
15/9/58

PETROLOGICAL REPORT

Both polished sections and thin sections were employed in this study. Polished sections were made of samples III, IV, and V and thin sections were made of samples I and II.

The polished sections show three types of hematite mineralization. The first type is typified by sample IV in which macroscopic colloform banding is well developed. The bands are approximately ¼ inch wide. Microscopically the bands consist of rather large plates of hematite aligned essentially perpendicular to the surface of the bands and tending to form rosettes in places.

The second type is typified by sample V and has the same overall structure as the first type. Under the microscope, however, it is seen that the plates, in this instance, consist of many tiny grains in parallel optical orientation.

The third type is typified by sample III and macroscopically appears to be earthy red hematite. Microscopically it consists of numerous tiny grains of hematite intermixed with clay and some limonite. A few ?residuals of large-grained hematite were present and these were shattered in some instances. In this sample tiny (less than 3 microns in diameter) grains of gold were encountered. Not many are present and they occur essentially in the more clay-abundant portions of the rock.

Sample II is a light brown-yellow altered rock. Thin sections show grains of quartz (and a few of felspar) in a groundmass of limonite and clay. The quartz is strained and a number of the grains are fractured. A few small areas of unaltered rock were also present and these consisted of an irregular sized aggregate of quartz and feldspar. A few odd grains of tourmaline were also present in the rock.

Sample I is an aggregate of quartz grains (and a few feldspar grains) cemented together by colloform hematite. The quartz grains are strained and fractured and very irregular in outline. The feldspar is almost completely altered to sericite and incipient limonite alteration is evident.

CONCLUSIONS

The samples described are surface samples and their exact locations were not reported so that their relation to the mass as a whole is not known. However, a few tentative conclusions may be stated.

The colloform nature of the hematite suggests deposition in open spaces. The inclusions of strained and fractured quartz grains indicates a breccia cemented by introduced hematite. The clay observed in the fine-grained hematite is doubtless a product of brecciation and it appears as if it has acted as locus for the deposition of tiny grains of gold. The ? residual laths of hematite in the fine-grained hematite are harder to explain. They might represent hematite in the rock before the main mass of hematite was introduced.

Upon exposures to the elements, the hematite weathers to limonite. The limonite in the limonite-infiltrated gangue was probably derived from the weathering of the hematite.

Examined by R. F. LaGanza

ASSAY RESULTS

	Mark	Fe%	Insol.%	Au per long ton
A926/58.	Costean I. 30'E, BA2.0 (19' exposure)	42.9	36.5	S. trace
A927/58	Costean II. North, BA4.3 (27' exposure)	35.3.	47.0	Trace
A928/58	Impregnated Sandstones Host rock to ore 8' wide 20'W BA 1.1	18.6	71.2	Nil
A929/58	Iron ore, 6' wide, 20'W	54.7	18.6	S. trace
A930/58	Iron ore from ore vein N. (4200' from main ore zone)	65.9	3.2	Nil

"S. trace" signifies less than ½ dwt. per long ton

"Trace" signifies less than 1 dwt. per long ton

Locality: Surface chip samples. Section: 5

Hundred: Campoona

Source: R.C. Mirams, Mines Department.

Thomas R. Frost
CHIEF ANALYST

SPECTROGRAPHIC ANALYSIS

Mark	Approx. Concentration	A926/58
Major	10 - 100%	Fe, Si, Ca
Minor	1 - 10	Mg, Al
Heavy Trace	0.1 - 1	Mn, Ti.
Trace	0.01 - 0.1	Sr, Ba, Cr.
Faint Trace	10 - 100 p.p.m.	B, V
Very faint trace	1 - 10 p.p.m.	Ni.

Not Detected:

Ag, As, Au, Be, Bi, Cd, Co, Cs, Ga, Ge, In, Ir, Mo, Nb, Os, Pb, Re, Rh, Ru, Sb, Sc, Sn, Ta, Te, Th, Tl, U, W, Zn, Zr, Rare Earths

Locality: Surface chip samples from costean I. 30'E, BA 2.0 (19' exposure) Section 5. Hundred of Campoona.

Source: R.C. Mirams, Mines Department

Spectrographic analysis by A.B. Timms

Thomas R. Frost
CHIEF ANALYST

TO THE DEPUTY DIRECTOR OF MINES:

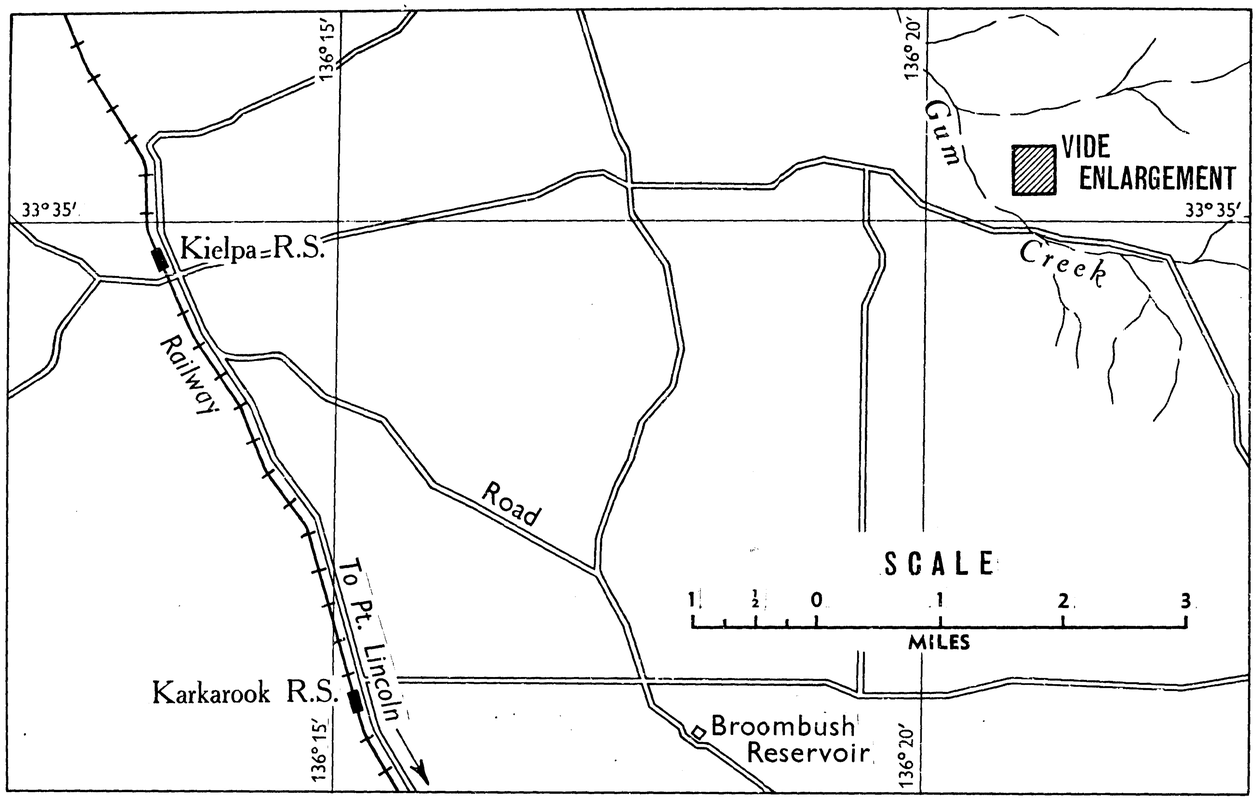
Hematite deposit, Section 5, Hd. Camposno, Co. Jervois.

Herewith report by W.R. Appleby Geologist on the above hematite deposit.

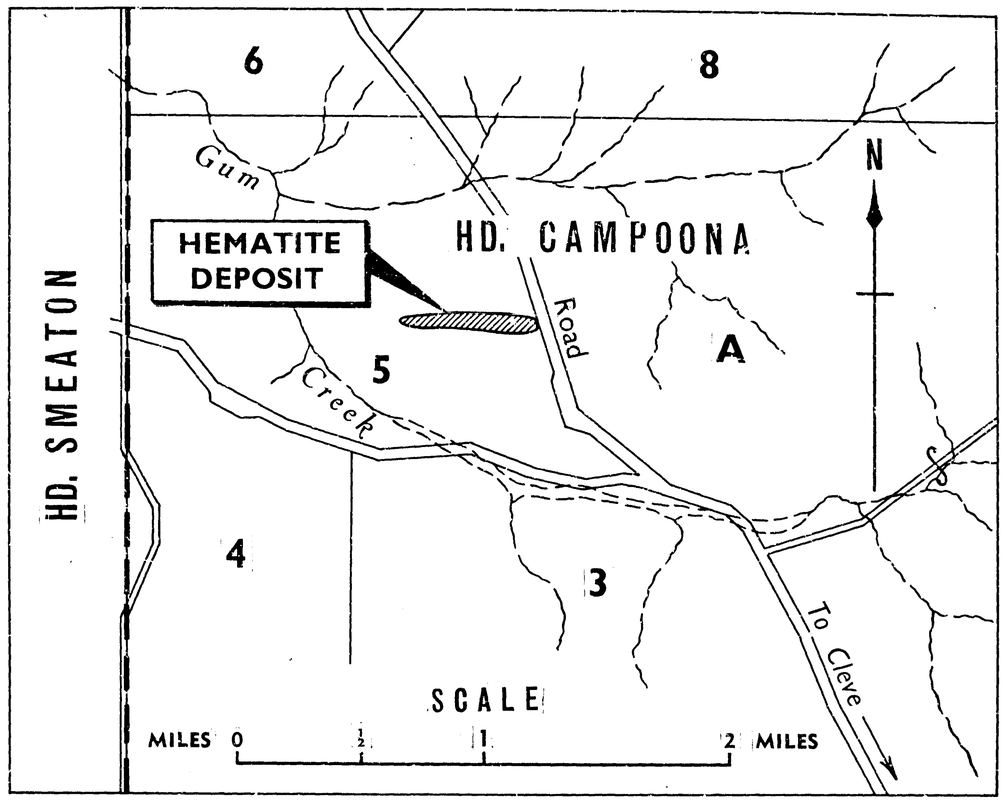
Unless the scout gravity traverses to be put in by Mr. McMutrie show the presence of a large mass below the outcrop, the deposit is too small to warrant further testing by the department.

(R.C. Mirams)
GEOLOGIST IN CHARGE
IRON SECTION.

RCM: MT
17/9/58.



LOCALITY MAP



ENLARGEMENT

LEGEND

Alluvium

Sandstone

Sand

Hematite

Strike & dip of bedding 25

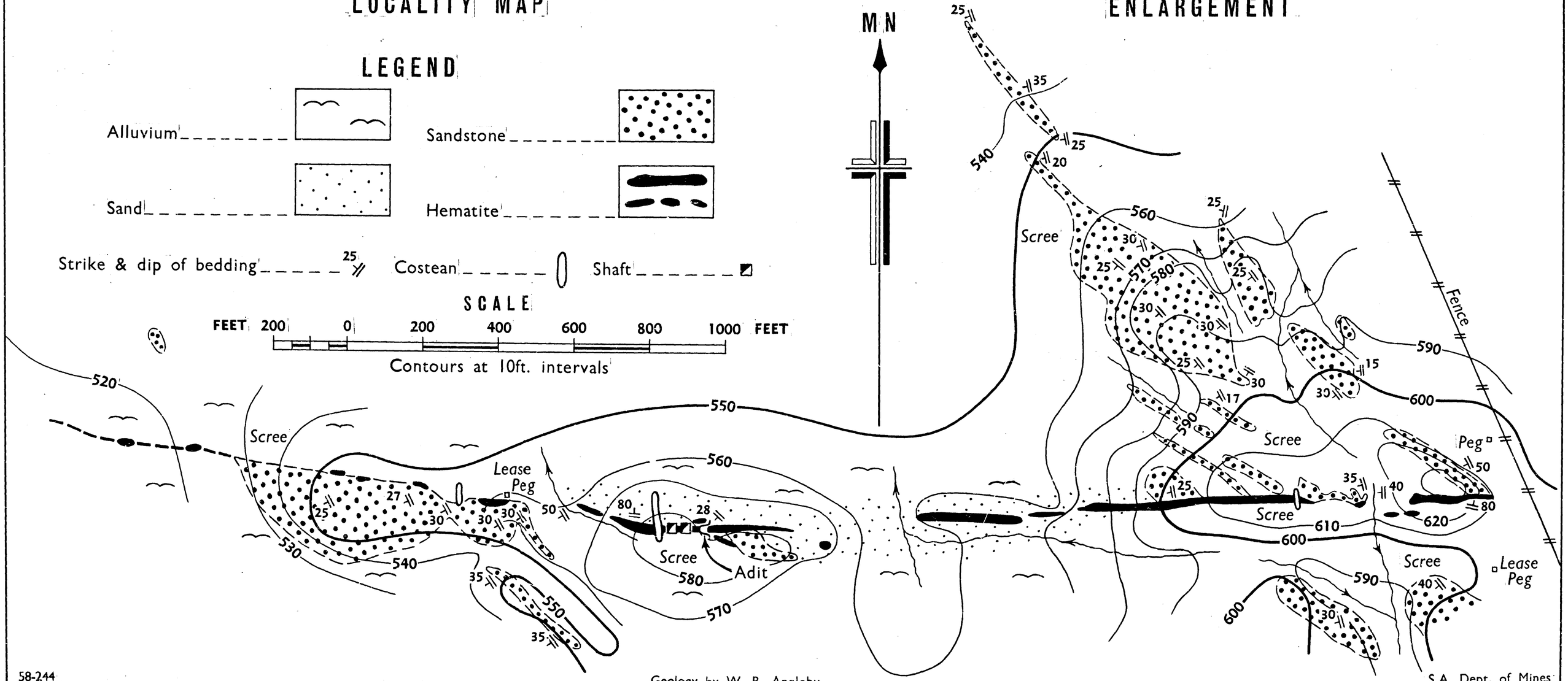
Costean

Shaft

SCALE

FEET 200 0 200 400 600 800 1000 FEET

Contours at 10ft. intervals



58-244

Geology by W. R. Appleby

S.A. Dept. of Mines