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SML 319

EURELIA

PROGRESS AND ANNUAL REPORTS TO LICENCE EXPIRY/RENEWAL FOR THE PERIOD 23/6/1969 TO 22/6/1970

Submitted by
Jedda Explorations Pty Ltd
1970

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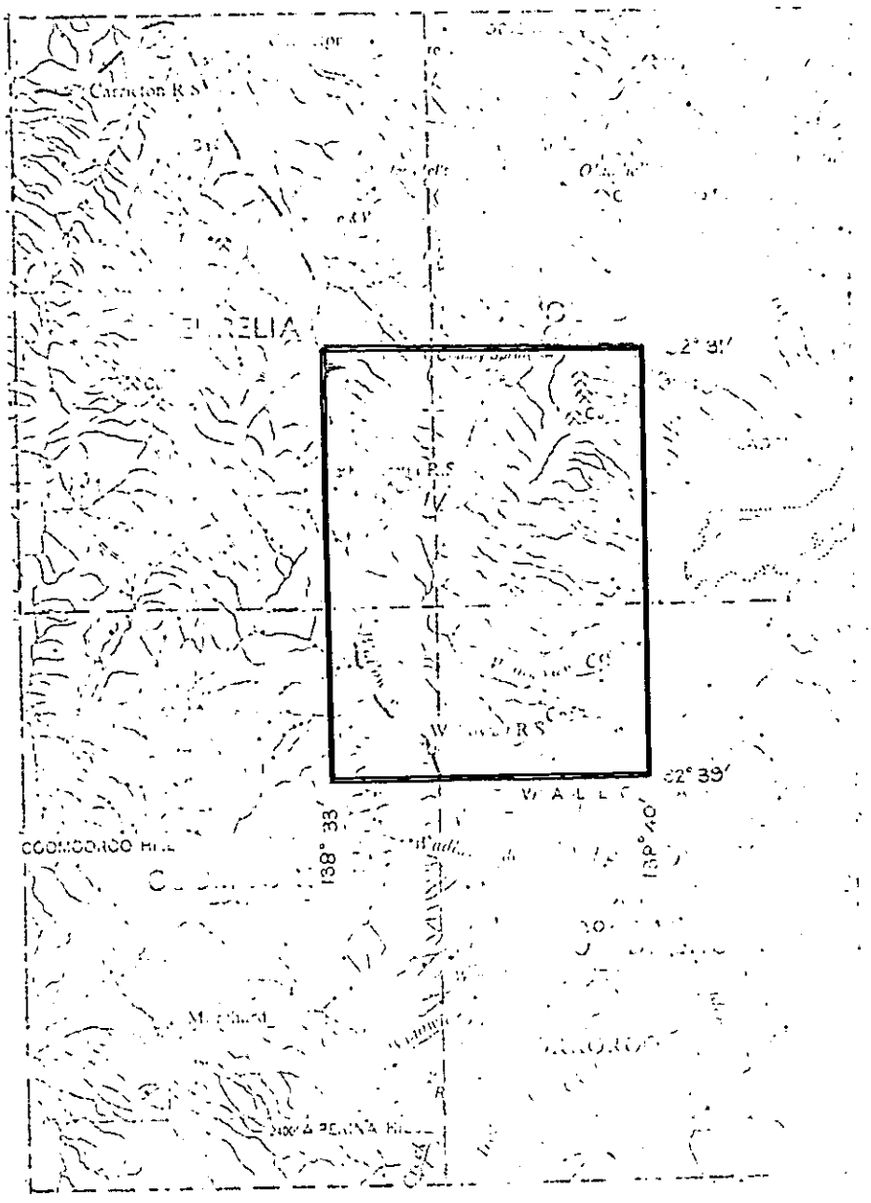
Government of South Australia
Primary Industries and Resources SA



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JEDDA EXPLORATIONS PTY. LTD.

DM 676/69 65

PLANS . ORRORCO

LOCALITY WALLOWAY

P.L. No. 319 22.6.70

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TENEMENT: S.M.L. 319

TENEMENET HOLDER: Jedda Explorations Pty. Ltd

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ENV 1123

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192 MAGILL ROAD
NORWOOD. S.A. 5067

BOX
NORWOOD P.O., S.A. 5067

TELEPHONE 32 1708 OR 31 3019

CENTRAL MINERALOGICAL SERVICES

29th September, 1969.

The Manager,
Jedda Explorations Pty. Ltd.,
Suite 14, 474 St. Kilda Road,
MELBOURNE. Vic. 3000.

REPORT CMS 69/160.

YOUR REFERENCE: Verbal Request

DATE RECEIVED: 15/9/69

SAMPLE NO: ----

SUBMITTED BY: Mr. C.Davidson

WORK REQUESTED: Field Assessment.

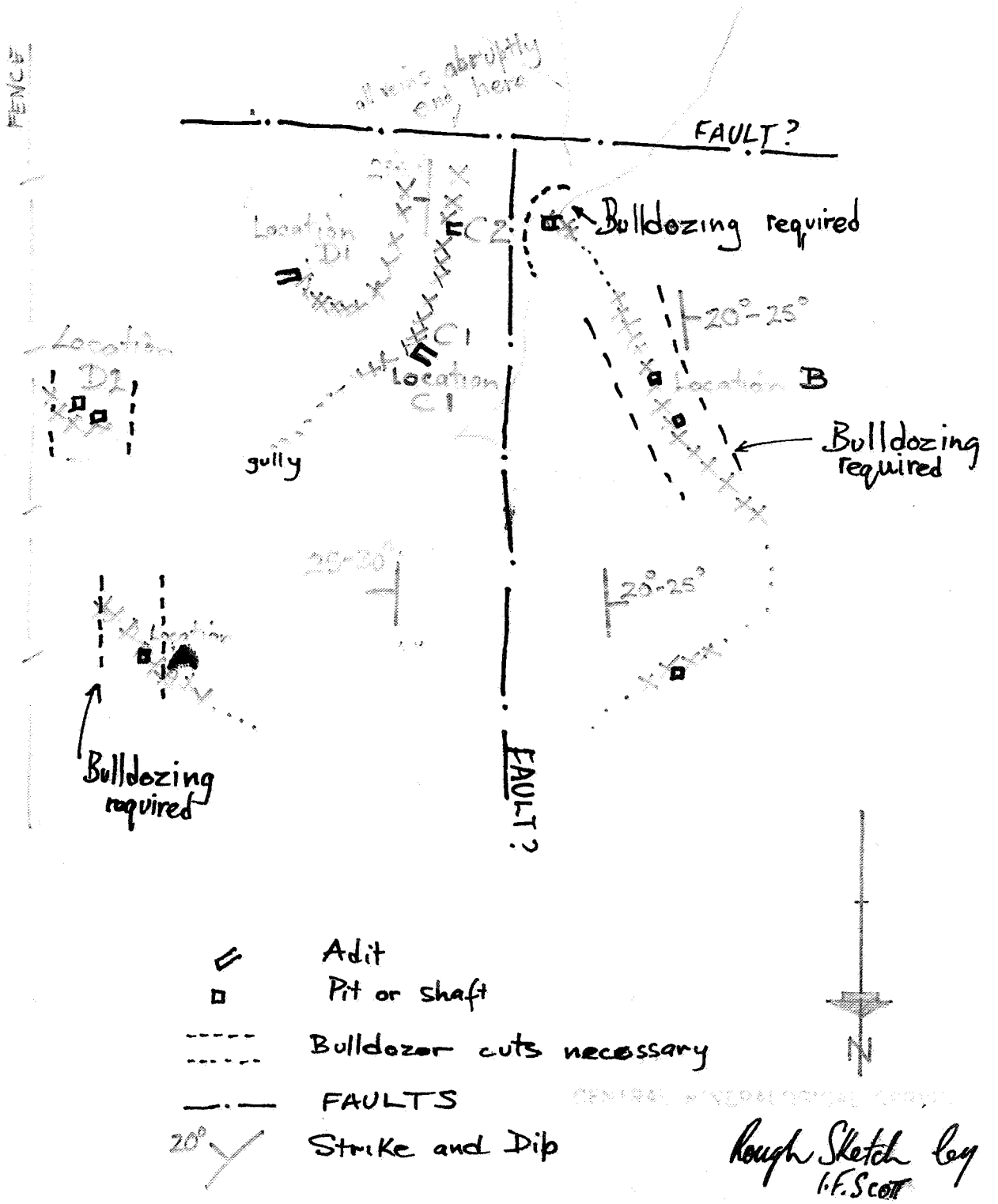
for H.W.Fander, M.Sc.

cd.

HORSESHOE PROSPECT

Scale 1 inch = 250 yards (approx.)

FIGURE 1.



29th September, 1969.

FIELD ASSESSMENT IN THE ORROROO AREA.

Introduction.

A number of barite and copper prospects were examined to the north and east of Orroroo.

Horseshoe Prospect (in 65 Sq. M. S.M.L.)

This area contains significant barite mineralization but only traces of copper. The prospect is located 12 miles directly north of Orroroo in the foothills of a prominent chain of hills trending approximately north-south. The S.A. Mines Department 4-mile Orroroo sheet indicates rocks of Torrensian age overlain, to the west, by younger Sturtian rocks.

In the area surrounding the barite veins the rocks range from fine-grained, well bedded dark grey shales to brown, grey and green dolomitic rocks.

As indicated in Figure 1 the survey has defined a contrasting relationship between various dip readings taken across the stratigraphic section (east-west). The most easterly beds outcropping in the sequence are green and grey slates as well as buff and grey-buff dolomites. These rocks dip to the EAST at angles between 25° and 30°. Approximately 250 yds. west of the foothill outcrops (which overlook the Oladdie Plain) the bedding abruptly changes to dips of 20° to 25° to the WEST. All the beds in the area strike approximately north-south parallel to the range of hills.

Although a more thorough survey would be required to clarify the geology of this area the immediate inference is a fault contact between the differently dipping beds (which change within a matter of tens of feet). A fault is suggested in preference to

an anticlinal fold because of the abruptness of the change in dips and instead of an unconformity because rock types throughout the sequence are identical. The green slates are well bedded and cleavages are steeply dipping to the west, or nearly vertical. The dolomitic rocks are fine grained and massive in fresh hand specimens but weathered examples do show obvious bedding.

Mineralization.

Barite is the major mineral of importance at the Horseshoe Prospect. Only traces of malachite were observed in association with the barites and samples of dolomite containing arsenopyrite segregations were collected. The latter should be tested for gold content.

The barite is invariably associated with quartz in reef-like veins, commonly parallel to bedding in both the easterly and westerly dipping sequences. However, probably the most important barite vein occurs on the eastern side of the foothills overlooking the Oladdie Plains (and north 150ft. from the small gully cutting through the sequence). This vein does not appear to follow bedding and outcrops along a line trending up over the hill to the north-west (345° approximately). Its exact orientation is difficult to determine but it appears to dip vertically. The vein is at least 10ft. wide over an uphill outcrop length of 30 to 35ft. Both quartz and specular hematite are associated with the vein but segregation within the leader has caused the lower (and wider) portion of the vein to be mainly barite, with a little hematite, while further up the hill (for 50 to 100ft.) quartz is the dominant constituent. For reference on Figure 1 this area is called LocationA. Smaller quartz barite leads, parallel to this larger vein, outcrop some 25yds. further west on the north side of the small gully through the section.

Location B (Figure 1) is quite an extensive outcrop of quartz and barites in the westerly dipping sequence of sediments. In

this zone of mineralization, and at locations C and D, the barites is invariably enveloped in a quartz layer both below and above the barite veins. The barite is usually less than two feet wide but at location C1 where it is intermixed with hematite as well as quartz it may be up to 4ft. wide. The quartz associated with these barite leads commonly reaches one to two feet in thickness on either side of the barite. At Location C1 a 20ft. adit has been driven into the hill in a south-easterly direction and a winze has been sunk within 10ft. of the portal. A short (6ft.) adit some 100-150ft. south of this adit, Location C2, contains traces of malachite and directly above this area on the hillside (to the east) and before the overlying quartz-barite vein the arsenopyrite in dolomite was found. Both leads in this area are in easterly dipping beds. An adit dipping into the hillside in a westerly direction has been driven across the upper quartz barite lead (Location D1) and Location D2 may well be on the same lead cutting back through the hillside overlooking the Oladdie Plain but on the southern side of the gully which transects the sequence. The two shafts sunk at Location D2 have also intersected minor amounts of secondary copper minerals (malachite).

Recommendations.

Location A is probably the most significant of the barite-bearing areas and is obviously a first choice for open cut work.

Location B would be the next most accessible and useful area to open up by bull-dozer, especially its more southern extremities. However the quartz content of this lead would make the economic content a little doubtful unless selective extraction of the barite could be achieved, e.g. by hand sorting. Locations C and D are more inaccessible and of even more doubtful value because of associated quartz but preliminary open cutting of their lower extremities in the gully cutting through the section would be advisable. Further systematic geological mapping would help clarify trends of barite veins in the area.

29th September, 1969.

008

UNNAMED COPPER PROSPECT (on 65 Sq. Ml. S.M.L.)

(Approx. 2 miles north of the Horseshoe).

Host rocks in this area are grey slates exhibiting fine bedding features. The bedding trends east-west (Strike 280°, dip 40°S), but cleavage runs almost at right angles to this direction (strike 210°, dip 65°E). A deep shaft (>150ft.) has been sunk at the intersection of these two major structural features at what is best described as the south-east "corner".

Gossanous zones follow both of these directions to the north and west of the shaft. The zone to the west, parallel to bedding is four to six feet wide but the northerly trending zone (parallel or nearly 80° to cleavage) varies from 15 to 20ft. in width.

Mineralization.

Only secondary copper carbonates were observed in the gossanous material and in the dump material around the shaft. Quartz is the major mineral apart from limonitic iron oxides in the gossans and it is this mineralized quartz reef which apparently held the ore values. The shaft has a reported depth of 270ft. and further cross-drives at depth but these under-ground workings were unobservable.

Recommendations.

1. Geochemical sampling of the shallow soil profile may give indications of the extent of the mineralization other than that associated with gossan zones. A grid should be laid out parallel and at right angles to the bedding direction before systematic soil sampling is undertaken.

2. Open cut work would be of no benefit on this prospect.

3. A self potential survey could be the most appropriate method for determining the extent of sulphides at depth.

009 29th September, 1969.

RHONDDA MINE.

This deep shaft and associated workings are to be found approximately 500yds. east of the road from Carrieton to Carrieton East and 4 miles from Carrieton (see Orroroo 4-mile geological sheet).

The host rocks for the copper mineralization are pyritic black shales striking 305° and dipping 42°N.E.

A very deep shaft (>150ft.) has been sunk on the line of mineralization and a smaller "air" shaft occurs 200ft. across strike to the north-east.

Large quantities of pyrite are present in the gossanous material from the dump around the main shaft and only minor copper carbonates were observed.

Recommendations.

1. Soil sampling on a grid pattern parallel to the pegged claim i.e. parallel to bedding, should indicate any anomalies which could occur down dip (to the N.E.).

2. A Self Potential survey over any geochemical anomaly may indicate whether mineralization is present in more than one zone (or lens-like body). Care should be taken with interpretation in case other pyritic shales are present. These may give anomalies although their base metal content need not be great.

010 29th September, 1969.

EAST OF ORROROO.

Some 15 miles to the east of Orroroo a number of copper prospects, including the "Burnt Pussy" and the "Wade Copper Mine" are located in a northerly trend range of hills containing rocks of similar age to those near the Horseshoe Prospect.

The host rocks at the Burnt Pussy prospect are Sturtian Tillites overlain by fine-grained tillite (?) forming the top of that sequence and these are conformably overlain by sandstones.

A fifteen foot shaft off which a 30ft. northerly trending drive has been excavated follows the line of mineralized quartz. The quartz at the surface is approximately one foot wide but on either side the tillite has been strongly altered and iron enriched (not exactly the same as gossan). The quartz contains primary chalcopyrite, partly altered to iron oxides and copper carbonates. The quartz vein follows parallel to the bedding which strikes at 80° and dips 20°N. A strongly developed cleavage strikes north-south and dips 55°W.

In the overlying quartz sandstone to the west of the shaft, near the top of the ridge numerous ½ inch to 18 inch quartz veins containing pyrite are present cutting across the sequence.

Recommendations.

1. Open cutting by bull-dozer in the area of the shaft would probably give a clearer indication of the extent of the mineralized quartz lode.

2. As an alternative, drilling short holes over the area north and west of the shaft should clarify the extent of the mineralization. These holes should be vertical or nearly so, to intersect the relatively flat lying quartz leader.

011 29th September, 1969.

WADE COPPER MINE.

The copper showing occurs some one to two miles south from the Burnt Pussy Prospect and here the mineralization is confined to quartz leaders in schistose rocks underlying the thick tillite sequence.

Two short adits have been driven onto quartz leaders which follow the bedding (strike approx. 50°, dip 60°-80°W). The bedding has been severely contorted in places and no consistent dips could be obtained. The southern most of the two adits is 25ft. long cutting into the hill along a direction 140° (to the east). Two short cross drives both north and south have been cut (10ft. in length) along the line of the lode.

Costeens above the northern adit (150ft. N of the southern adit) trend 150° and follow chalcopyrite-bearing quartz leaders not unlike those at the Burnt Pussy. Minor barite is present with the quartz and traces of malachite are also present in the dump material.

Recommendations.

1. Map the outcrop of quartz leaders.
2. Open cut these chalcopyrite-bearing lodes by bulldozer to determine their extent and accessibility.

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29th September, 1969.

UNNAMED PROSPECT -- 1 - 2 miles south of "Wade Copper Mine".

Host rocks in this area are spotted micaceous schists which strike 110° and dip 30°N.

The mineralization occurs in a quartz lode striking 225° - 230° and dipping steeply north 65° - 80°. The quartz lode follows the cleavages in the host rocks.

Two very deep shafts have been sunk onto the line of mineralization but only carbonates of copper are present in the dump material at the surface. The shafts have now been filled with mullock 25 - 50ft. from the surface.

A second, and apparently barren, quartz reef occurs approximately 100yds. to the south and outcrops parallel to the mineralized leader.

Recommendation.

1. As the mineralization appears to be confined to the quartz zone its extent would be best determined by a Self Potential survey of the area. Any type of survey of this kind should cover the outcrop of the second parallel reef, even though it does appear barren.

2. Drilling would be necessary to confirm any anomalies obtained by geophysical or geochemical surveys.

I.F.Scott.

FIGURE 1

HORSESHOE PROSPECT

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Scale 1 inch = 250 yards (approx.)

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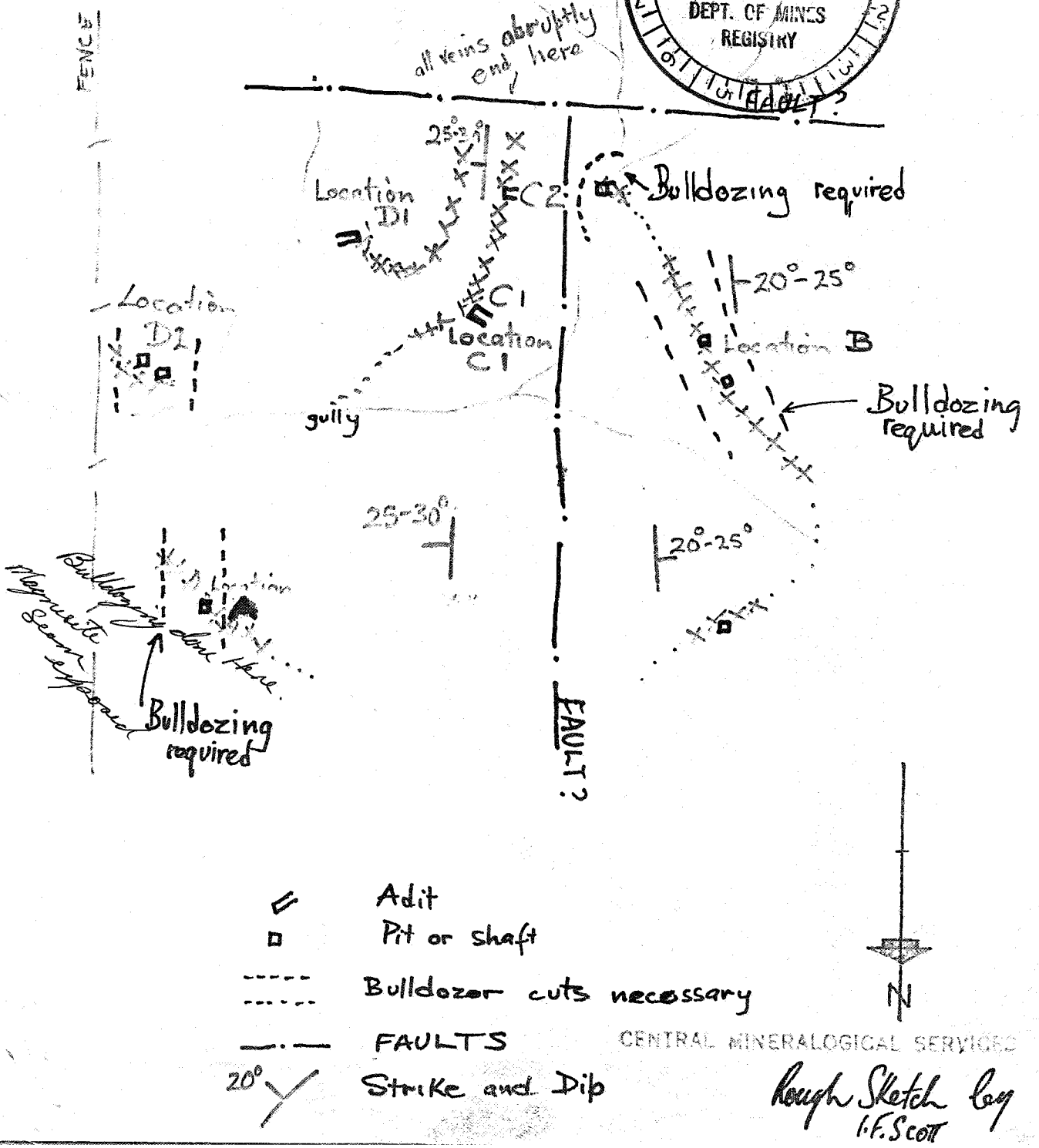

CENTRAL MINERALOGICAL SERVICES

Rough Sketch by
I.F. Scott

192 MAGILL ROAD
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CENTRAL MINERALOGICAL SERVICES

18th November, 1969.

ENV 1123

The Manager,
Jedda Explorations Ltd.,
Suite 14, 474 St. Kilda Road,
MELBOURNE. Vic. 3000.

REPORT CMS 69/206.

YOUR REFERENCE: Verbal Request 6/11/69

DATE RECEIVED: 6/11/69

SAMPLE NO: ----

SUBMITTED BY: Mr. Sullivan

WORK REQUESTED: Field Assessment.

H.W.Fander, M.Sc.

cd.

18th November, 1969.

Field Assessment in the Orroroo Area
13/11/69 -- 14/11/69.

Two areas were visited during this two-day trip to the Orroroo area.

A. Oladdie Claims -- north and west of the Oladdie Barite Mine.

A brief survey of the area was carried out on foot. The main interest in the area is the crush zone immediately north of the Oladdie barite outcrop and a shaft sunk for ?copper on the eastern and northern part of the area under consideration.

Although no further barite outcrops were discovered in the area a number of stream sediment samples were taken in gullies draining the central portion of the area, including the crush zone. The results of these heavy mineral determinations will be forwarded at an early date but may take one week to complete.

A shaft has been sunk in a gossanous manganese-magnesite enriched brecciated quartzo-feldspathic rock in the north-east portion of the area but no minerals of economic interest are present. Copper was not observed and the other minerals are not present in amounts of any significance.

An interesting find of chalcopyrite in steeply dipping, north-south trending dolomite in the central portion of the area (in the gully draining towards the Oladdie Mine) was made in virgin rock. Although not much of this mineral was found it does indicate an anomalous area with some potential. Any future investigation in the area should include work to delineate this metalliferous zone and give a more accurate indication of its worth.

18th November, 1969.

B. The second area investigated lies between Colliny Creek and the Horseshoe prospect, some 2 miles further south. The reported occurrence of a "hill of dolomite" was checked out and in fact found to be true. The presence of barite in this area was unfounded.

Two small prospecting pits and an "open cut" occur just to the south of this hill of dolomite (within ½ mile) and approximately 1 mile north of the Horseshoe. No copper mineralization was found.

Another shaft and adit further to the north (½ mile) contained copper stains (malachite) in a narrow, one foot, gossanous quartz vein which dips steeply south and strikes E-W approximately. The host rocks are fine grained shaley sediments not unlike those around a further copper shaft some ½ mile further north. This copper show was reported on in CMS 69/160 (an unnamed copper prospect 1 mile north of the Horseshoe).

All of these shafts and adits appear to have been prospecting attempts rather than actually producing mines but their persistence from the Horseshoe Prospect through to the Oladdie area (8-10 miles) does indicate a potential prospecting area using modern sophisticated methods. Soil sampling followed up by geophysical techniques and confirmation, or otherwise, of anomalous target areas by drilling, would be the normal method of approaching this type of field problem.

I.F.Scott.

for H.W. Fander.

cd.

017

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CENTRAL MINERALOGICAL SERVICES

CMS 69/198

The Manager,
Jedda Explorations Pty., Ltd.,
14/474 St. Kilda Rd.,
Melbourne.

The following geological report sets out details of field work carried out between 20.10.69 and 22.10.69 in the Arroroo Area of South Australia.

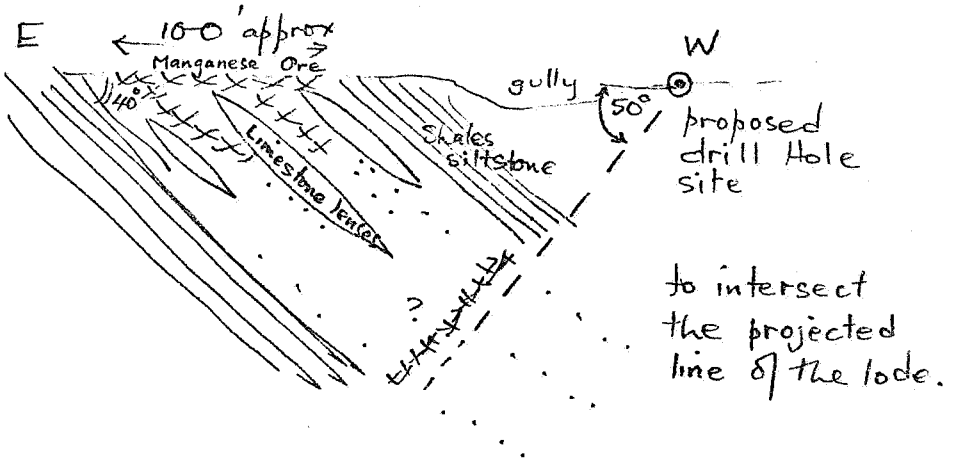
The aim of the two day project was to carry out assessments on the Eurelia copper locality (within Jedda's 65 sq. ml. S.M.L.), the free mining claims north and west of the Oladdie Mine and to visit the Muttaleee manganese mine. Due to unforseen delays the area around the Oladdie Mine has not been assessed although Bob Chadwick from Arroroo

has visited the area. A two-day coverage of the area would enable stream sediment sampling to be carried out but a more comprehensive geological survey would take more than one week. Bob Chadwick's reports of the area did show up some minor copper shows but no barites was found.

The Eurelia copper locality occurs within 3/4 mile north of the Eurelia cemetery. Malachite and quartz are present in a two foot deep pit on a quartz bearing ridge. The host rocks in the area are slates. This prospect appears to be of no significance.

The Muttaleen Manganese Mine (9 miles south-west of Carnarvon) covers a strike length of 500 feet and has a surface width of approximately 100 feet. The manganese is associated with a limestone lens within silty rocks. The sediments trend north-south and dip westerly at 40°. Numerous workings follow the manganese lodes down dip. The manganese occurs as brecciated fragments, cement for brecciated siltstones and in massive

colloform banded aggregates still 019
outcropping in situ on the line of the lode. Assays of this material would be necessary to determine their manganese content. A survey of the underground workings would be useful but could be dangerous. As the lode dips westward at 40° an inclined drill-hole pattern (dipping 50° to East) beginning some 100-200 feet west of the outcrop would give the best idea of the Mn content of the mineralized sediments at depth.



Not less than 3 drill holes would be required initially to determine the cross-sectional width of the lode at depth and also to give some idea of its lateral extent.

A survey of work in progress at the Horseshoe Barite Prospect was also carried out by request. Open cutting of areas A and B (see figure 1. of report CMS 69/160) Both appear to be progressing satisfactorily.

The barite - quartz - hematite - siderite vein at location A has been cleaned and opened on its northern and uphill limit. Further work should progress down strike in a south-easterly direction because the vein cuts out of economic material further northwards.

A number of stream sediment samples have been taken in the Horseshoe and Gladdie areas to determine the usefulness of this type of geochemical prospecting. Ten samples were taken in the field and heavy mineral separations in tetrabromoethane (S.G. = 2.96) were carried out on the -420# fraction (B.S.S.) in the laboratory.

The Horseshoe Prospect was used as a reference and the streams sampled above and below the barite outcrop

Barite grains were identified in the heavy fractions of both H_3 and H_4, the samples coming from immediately downstream from the barite in the hillside overlooking the plain (H_3) and approximately half of a mile further downstream where the access road along the fence cuts the easterly flowing Horseshoe gully (H_4). This exercise is proof, therefore, that barite will be able to be picked up in samples at least within $\frac{1}{2}$ - 1 mile downstream from any one outcrop. However negative results were obtained from samples taken in the Oladdie Creek on the Johnburgh road. This location (01 and 01A samples) is some 3 - 4 miles downstream from the Oladdie barite deposit and therefore secondary streams and longer transport distance (i.e. more abrasion & weathering) have diluted the heavy fraction considerably and therefore barites has not been confirmed.

The method should therefore give positive results within one mile downstream from any significant barite deposit and can be used with some confidence in

a sampling programme along the entire 02
range of hills, especially in the 65 sq.
mi. S.M.L. and in the area directly north
of the Oladdie mine.

Two samples were taken along the
access road to the Horseshoe Prospect in
the streams directly south of the Horseshoe
gully (samples HS1 and HS2). Both
proved negative and therefore a
considerable portion of the central
area of this north-south range of hills
appears to be barren, with respect to the
presence of barite. Confirmation of these
results can best be made by sampling
all of the streams at the point where
the foothills meet the elevated plain.
The same systematic sampling should be
done in the Oladdie area to complete the
survey. This method should be as
successful ~~as~~, if not more so, as scouting
the area by foot and of course a lot less
time consuming.

As well as barites, other heavy
minerals of any importance will be identified
by this type of survey e.g. malachite.

Scott

CMS

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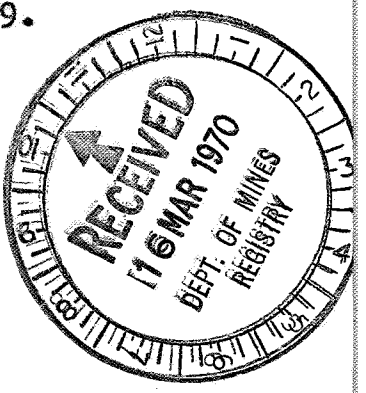
CENTRAL MINERALOGICAL SERVICES

23rd December, 1969.



C. Davison, Esq.,
Jedda Explorations Ltd.,
Suite 14, 474 St. Kilda Road,
MELBOURNE. Vic. 3000.

Dear Sir,

TRURO TALC PROSPECT.

At the request of yourself and Mr. Sullivan, I visited the talc prospect on Mr. Cook's property north of Truro.

The talc occurs as a massive or lenslike body striking N to NNE and Dipping W at 50°-60°. In the pit, a width of about 20ft. is exposed, consisting of coarse white talc and siliceous lenses. Iron-staining, due to surface waters, occurs but would probably not persist in depth. To the west, quite massive talc occurs in a small pit and more talc in a shallow trench, making a westerly extension of 60ft. On the eastern side, another small pit 15ft. east of the pit (i.e. main pit) shows good talc. If water is available it should be fairly easy to produce a clean talc concentrate free of silica and quartz. The talc extends N-S over a visible distance of at least 60ft.

To the south and west of the main pit, there are indications of sillimanite -- and asbestos -- bearing metasomatic rocks which certainly warrant close examination and trenching. The asbestos on the western side near the creek occurs as good-quality fibres up to one inch in length.

Urgent attention should be paid to pegging on the west,

23rd December, 1969.

beyond the N-S road, and also along possible N and S extensions. A more detailed report will follow.

Yours faithfully,

for H.W.Fander, M.Sc.

cd.

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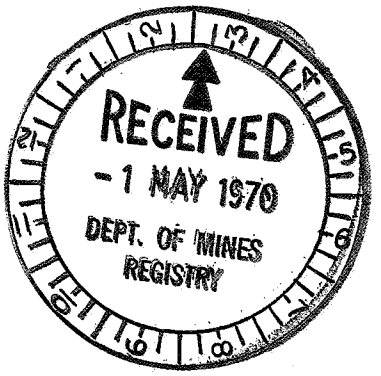
CENTRAL MINERALOGICAL SERVICES

20th April, 1970.



The Manager,
Jedda Explorations Ltd.,
Suite 14, 474 St. Kilda Road,
MELBOURNE. Vic. 3000.

REPORT CMS 70/4/21.

YOUR REFERENCE: Verbal Request

DATE RECEIVED: 15/4/70

SAMPLE NO: SML Report

SUBMITTED BY: Mr. C.Davison

WORK REQUESTED: Field Investigation.

H.W.Fander, M.Sc.

cd.

20th April, 1970.

Quarterly Report on SML319, South Australia.

Exploration work in the form of examination of field projects followed by open cut bull-dozing and/or percussion drilling has been carried out on SML319 north of Orroroo, South Australia.

At the Horseshoe prospect (12 miles north of Orroroo) the two main barite veins have been opened up by bull-dozing. Extensions to the original outcrops have not been disclosed by further exploratory work and ore reserves estimated from the surface exposures do not exceed 5,000 tons of barite. However, no drilling has as yet been carried out on the down-dip extensions of either of the veins and considerably more barite is expected below the surface. Blasting operations will be necessary to obtain a clean face from which quarrying can proceed. Although the veins have a maximum thickness of 10ft., underground mining is not being considered at this stage. As yet no barite has been removed from the prospect for processing at the Orroroo plant.

Two lens-shaped outcrops of manganese ore occur 2.2 miles east-south-east of Eurelia and these appear to be related to a shear zone adjacent to the western margin of a north-south trending dolomite horizon. According to the Orroroo 4 mile geological sheet this shear zone extends southward into a diapiric crush zone similar to that near the Oladdie Mine to the north. However the association of manganese oxides, weakly cobaltiferous, with dolomite within a silty regional host rock is similar to the occurrence of manganese in the Muttabee Mine to the west (near Hammond) and in a number of other localities in the same stratigraphic horizon and these occurrences are unrelated to any diapiric structures.

The manganese lenses at Eurelia are almost vertical bodies up to 10ft. wide, 100ft. in length and percussion drilling has indicated a minimum depth of 60ft. The ore is relatively low grade

20th April, 1970.

(too low for battery grade material), and unless improved quality is found at depth, its main use would be as a colouring additive for concrete and the like,

Further examination of the Eurelia copper prospect to the east of the township and north of the cemetery has indicated an extensive outcrop pattern which is synclinal in nature and plunges at a shallow angle to the south. A number of pits and small cuts have been made on promising outcrops around the margin of this structure over a strike length of at least 1.5 miles. Air photo interpretation suggests that the eastern margin of this synclinal structure is, in fact, fault controlled. Further clarification of the geology in this area is necessary in case of further repetitions of the mineralization result from fault movements. The mineralization is cuprite-malachite-azurite, the cuprite occurring within the bedding planes of a shaley sediment which has developed a near vertical cleavage. Secondary malachite and azurite occur within these cleavage planes.

Because of the southerly plunge of the syncline the northern portion should contain a more shallow zone of mineralization and a percussion drilling programme in this area is to start in the immediate future.

I.F.Scott, M.Sc.

cd.

192 MAGILL ROAD
NORWOOD, S.A. 5067

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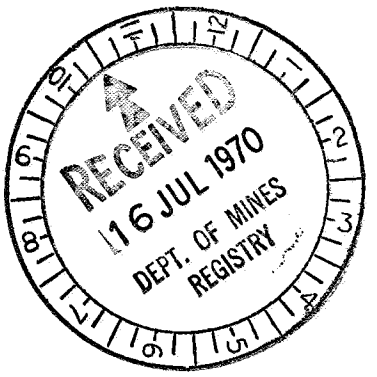
CENTRAL MINERALOGICAL SERVICES

10th July, 1970.



The Manager,
Jedda Explorations Ltd.,
Suite 14, 474 St. Kilda Road,
MELBOURNE. Vic. 3000.

SML 319 -- Annual Report June 1970.

for H.W.Fander, M.Sc.

cd.

Resume of exploration to date:-

1. Barytes -- Horseshoe Prospect; Section 25 Hd. of Oladdie, Co. Dalhousie (see Map 1).

General Geology: The Geological Survey of South Australia, Orroroo 4 mile sheet indicates fine-grained sediments of Torrensian age overlain by younger Sturtian (including tillites) rocks to the west, in the immediate area of the Horseshoe Prospect. Well bedded grey to brown shales and grey to green dolomitic beds are the most prominent sediments in the area. As indicated in Map 2 a geological survey of the area has defined a major break across the stratigraphic section. The most easterly beds outcropping in the sequence are green and grey shales and dolomites dipping 25°- 35°E. An abrupt change occurs some 250 yards west of the foothill outcrops overlooking Oladdie Plain. Bedding in this area strikes approximately north-south (regional trend), but dips WESTERLY 20-25°. The break is thought to be faulted rather than due to anticlinal folding.

Mineralization: A number of veins of barytes are present in this Horseshoe prospect, but only traces of copper were found. Location A (Map 2) contains a vein up to 10ft. wide running NNW from the Horseshoe gully. It has an almost vertical dip and outcrops over 150ft. until it pinches out in a northerly direction. Access roads have been made into this outcrop and extensive dozing has cleaned up the lode in preparation for blasting and removal to the Orroroo crushing plant.

The second outcrop of importance at the Horseshoe occurs at Location B. Quartz enveloping a 2-3ft. barytes vein dips westerly into the hill parallel to the bedding. Access tracks have been cut up the creek and up to a point above the lode (200ft. uphill), so that drilling equipment could be brought into to west

investigate reserves. Drilling is currently being carried out to test the vein 200ft. down dip. Some difficulty was being encountered with a green shaley bed immediately above the vein which had been metasomatized and completely converted to "bull-dust". Casing of the hole has been necessary to get through this layer.

A number of other quartz veins with minor associated barytes have been driven on by old prospectors (Location C). This area was known as Davill's No. 1 (1908 Record of the Mines of South Australia, H.Y.L. Brown, P106) and it was from Adits 1 and 2 that copper ore has been removed according to these old reports. Dolomitic beds above these parallel quartz veins were found to contain arsenopyrite in some areas. Copper mineralization appears to be mainly malachite and of apparently little significance.

In order to prospect the surrounding countryside for barytes a very successful stream sediment sampling technique was used. This entailed separation of the heavy fraction from fines in each sample and examination of these heavy minerals using oil immersion techniques and a petrological microscope. Numerous samples were taken from streams cutting into the range of hills in which the Horseshoe Prospect occurs, but other than confirming the usefullness of the technique (in samples directly downstream from the Horseshoe), no new barytes was discovered.

2. Copper

a. Two areas near Colliny Spring Sect. 44, Hd. Oladdie, Co. Dalhousie (See Map 1).
b. Davill's No. 2, Sect. 24, Hd. Oladdie (Map 1).
c. Eurelia Copper Prospect, Sect. 29, Hd. Eurelia, Co. Dalhousie, Sect. 40, 162, 22 Hd. Oladdie, portion of S.E. of Eurelia Township area (See Map 1). (near cemetery).

a. Colliny Springs Area (Map 1).

This area is situated north along strike from the Horseshoe prospect, but south of Colliny Creek (Sect. 44, Hd. Oladdie).

General Geology: Two minor copper localities were investigated. Host rocks in the area are fine-grained grey to buff shales, probably dolomitic in part. The outcrops follow the region NNE trends in the area (see Dept. Mines, Orroroo 4 mile sheet) and dip moderately to the west.

Mineralization: At the southern-most locality, a shaft and an adit have been driven on a narrow (one pot) gossanous quartz vein which strikes east-west and dips steeply to the south. Only minor malachite mineralization was observed.

Similar mineralization was present in gossanous quartz leaders at the more northern locality and a deep shaft (?150ft.) has been sunk into this zone where north-south and east-west gossans meet. This northern outcrop coincides with a change to E-W in regional trends due to the closure of a large anticlinal structure encompassing the whole range adjacent to the Horseshoe prospect (see Orroroo 4 mile sheet).

b. Davill's No. 2, Sect. 24 Hd. Oladdie.

This deposit is located on the eastern side, but near the top of the range approximately 1¼ miles SW of the Horseshoe prospect.

General Geology: The area consists of green and dolomitic slates for the most part with occasional quartzite beds acting as marker horizons. The country is very steep and access at this stage is by way of the easterly flowing creek. The country rocks strike N15° and dip 50°W.

Davill's No. 2: A shaft and a small underlay adit have been sunk on the narrow quartz-rich lode which contains chalcopyrite, chalcocite, malachite and minor azurite. The shaft is recorded to have reached 28ft. in depth, but now has fallen in at the 20ft.

level. The quartz vein is associated with dolomite gangue and varies from 6 inches to 12 inches wide in the shaft, but 50ft. further to the north was seen to be at least 3ft. wide. Chalcopyrite and traces of malachite were found in very minor amounts along strike, both north and south of the shaft for a total of 600ft. An access track is to be cut from the western side of the range to allow a more intensive investigation of the area.

c. Eurelia Copper Prospect (See Maps 1 and 3).

Location: This extensive copper prospect occurs 1½ miles east of Eurelia.

General Geology: Field investigations have proven that the copper mineralization occurs in a southerly plunging synclinal structure of Marinoan age. The important mineralization is related to the boundary of the Enorama Shale and the overlying Elatina Formation consisting of coarser sandy beds and dolomite horizons. The shale is generally purple in colour, but has been bleached to a grey colour in the zone of mineralization. The basal sandy unit of the Elatina Formation has acted as a competent bed during regional folding in the area although the beds immediately above it are isoclinally folded. The underlying shale is only gently folded in parallel with this more competent overlying unit and therefore can be relatively accurate predicted at depth. Dip reading on either flank of the syncline are approximately 45° (probably slightly steeper on the eastern flank cf. western flank). Near vertical cleavages have developed throughout the sequence and in the mineralized horizon these cleavages control the secondary alteration copper minerals.

Mineralization: In the copper bearing micaceous shale horizon the rock is a bleached purple shale with probably less than 10% silty fraction. A marked cleavage has developed at a high angle

to the bedding (approximately vertically across the area, parallel to the regional trends NNW) and while the secondary malachite tends to follow these cleavages, there is a constant relation between bedding and cuprite mineralization. Traces of sulphides (covellite) were also observed in these cuprite areas.

Apart from the malachite and cuprite (plus traces of covellite) a deep blue-green mineral is also common in some parts of the ore. This mineral has a clay-like grain-size and texture and although optical properties appear to fit kroehnkite this would have to be checked by X-Ray diffraction. This mineral has a composition of Na_2 Cu $(SO_4)_2$ H_2O and in view of the presence of albite in the rock, an explanation for the presence of sodium is therefore obvious.

Another green colloform banded copper mineral has optical properties similar to chrysocolla (Cu SiO_3. $2H_2O$), but similarly this would have to be checked by X-Ray diffraction. This mineral occurs within albite pockets and in veins offsetting malachite veins.

The presence of albite crystals in cavities and pockets closely related to bedding and therefore to cuprite mineralization indicates a probable LOW TEMPERATURE HYDROTHERMAL origin for the mineralization, rather than the earlier suggestions of syngenesis because of the relation between bedding and ore.

Access roads have been cut into the northern "nose" portion of the syncline where the copper mineralization appears to be richer as well as more accessible. Blasting has been carried out on the eastern flank of this "nose" area (see Map 3 -- blow locality) to expose more of the lode.

A large E-W cut is being excavated through the higher portion of this synclinal "nose" some 200ft. south of the most northerly extension. This will produce a complete cross-section of the synclinal mineralized horizon and, should proposed diamond drilling prove adequate tonnage for a viable operation,

this area will then provide a working face for mining operations.

Initially two diamond drill-sites have been planned (see Map 3) and projected geological information suggests that the shale horizon associated with mineralization should be intersected from 400ft. through to 1100ft. This will give information on the nature of the ore at depth as compared with the near-surface secondary copper minerals already observed. A further drilling programme will then be planned on information gained from this exercise.

3. Manganese:

a. Whaleback Prospect. Sect. 43, Hd. Oladdie, Co. Dalhousie.
b. Eurelia Manganese Prospect, Sect. 10, Hd. Eurelia, Co. Dalhousie.

a. Whaleback Prospect:

Location: This prospect is situated approximately one mile north-east of the northern limit of the Eurelia Copper prospect (see Map 1).

General Geology: Both this prospect and the Eurelia prospect occur in identical geological environments common to nearly all manganese deposits in this general area. They are restricted to the Lower Marinoan Tarcowie Siltstone and always occur adjacent to large dolomite limestone beds in this sequence.

Mineralization: The Whaleback deposit consists of two or three, three foot thick seams of manganese oxides occurring in a northerly running stream bed and another 8-10ft. seam in parallel approximately 100 yds. to the east and adjacent to a dolomite horizon. Three small shafts have been sunk into the lode which dips 52°W and strikes N20°E.

b. Eurelia Manganese Prospect:

Location: Approximately 2 miles ESE of Eurelia township (See Map 1).

General Geology: As for Whaleback Prospect.

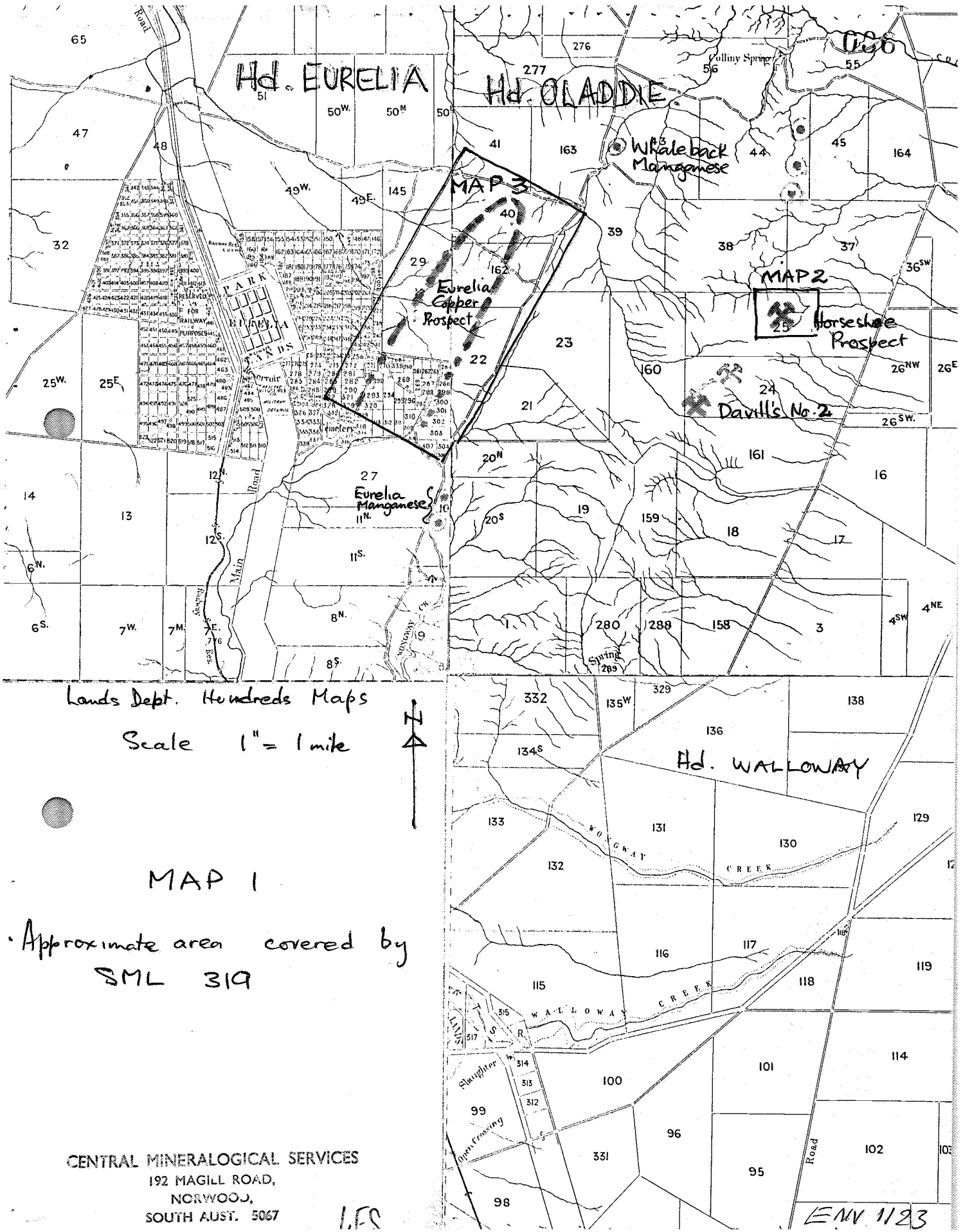
Mineralization: A small shaft has been sunk onto the southernmost of two manganese lodes in this area. This particular outcrop appears to have greater potential than the northern one and has been the object of a percussion drilling programme to outline the lode. The manganese ore occurs in lens-shaped bodies up to 100ft. in length and 15ft. wide. The second body is approximately half of this size.

Proposed Programme for 1970-71:

1. Geochemical sampling and mapping of the copper-bearing areas along strike south of the Horseshoe Barytes Prospect should be continued. This line of mineralization may be an extension of weaker copper showings to the north of the Horseshoe Prospect nearer to Colliny Creek. The latter are marked on the Orroroo 4 mile Geological Sheet.

2. With copper in mind once again, the area adjacent to the northern extensions of the Eurelia Copper Prospect should be examined in more detail. Major cross-faulting indicated by the geological map is not confirmed by photo interpretation and the possibility of extensions to the mineralized horizon should be clarified.

3. Of geological interest with respect to economic mineralization is the crush zone extending directly south of the Eurelia Manganese Prospect, towards Walloway. This same type of rock association is known to be mineralized at Oladdie (8 miles NNE) and in many other similar diapiric structures throughout the Adelaide Geosyncline. An exploration programme including geochemical sampling of this area is recommended.



Lands Dept. Hundreds Maps

Scale 1" = 1 mile

MAP 1

· Approximate area covered by SML 319

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NORWOOD,
SOUTH AUST. 5067

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HORSESHOE PROSPECT

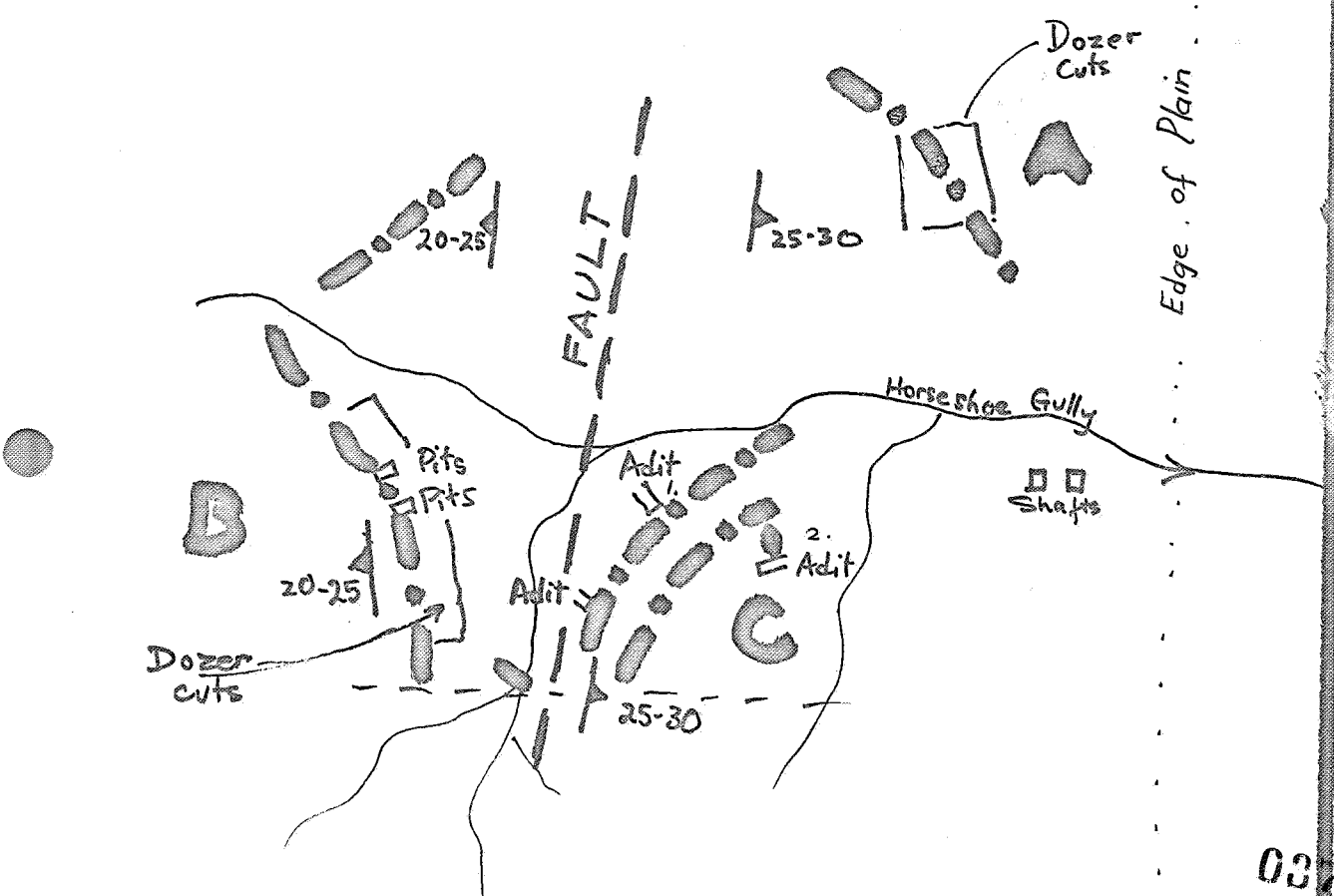
Scale approx 1" = 200yds

MAP 2.

Barytes with quartz

A,B,C Areas referred to in report

Strike & Dip of Beds



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SOUTH AUST. 5067

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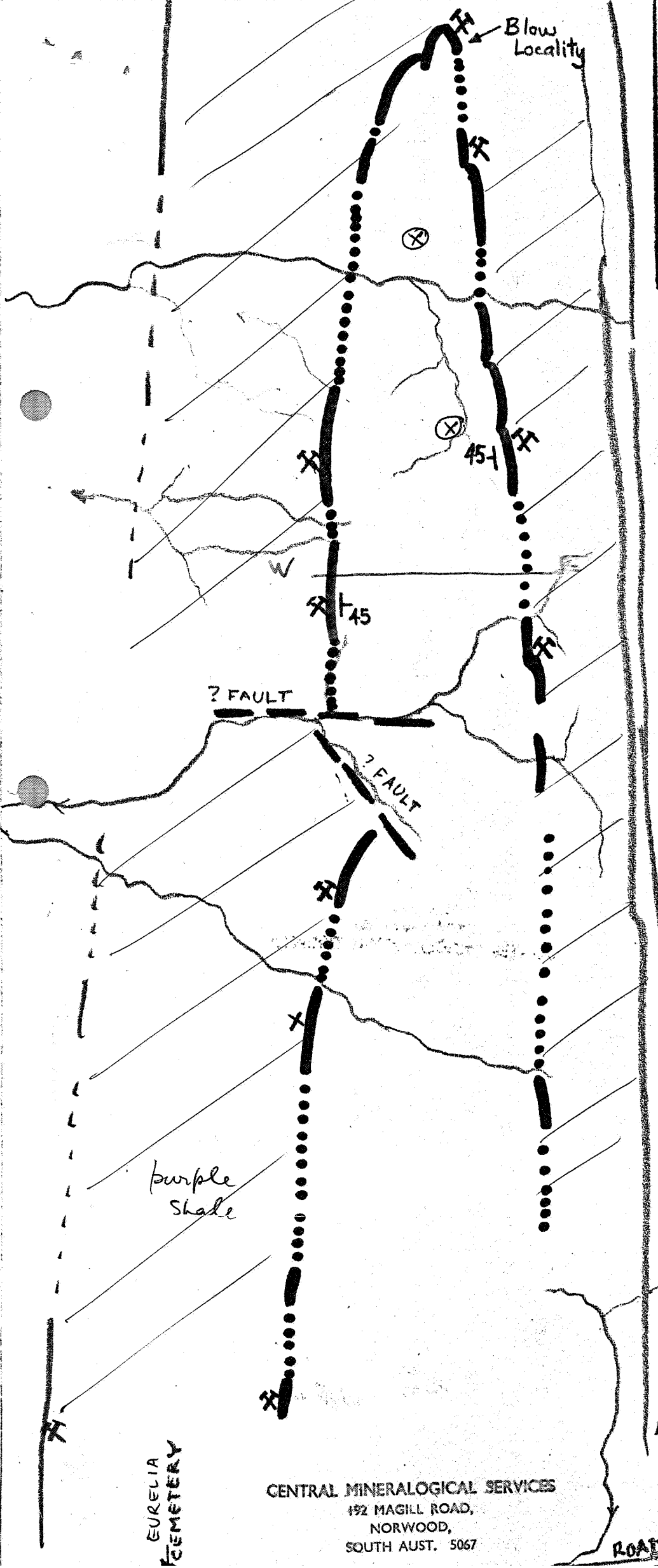

EURELIA COPPER M

JEDDA EXPLORATIO

Proposed DDH sit

Copper Localit

overlying quartzi

Structure

Creeks

40 Dip measuremen

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MAP 3

038

CENTRAL MINERALOGICAL SERVICES
192 MAGILL ROAD,
NORWOOD,
SOUTH AUST. 5067

Env. 1123

MEMO TO: R.C.Davison.
FROM: Jedda Orroroo.
DATE: 18th March '70
SUBJECT: Copper Showings on SML 319

Samples have been taken by Chappellè,Chadwick and Scott from various locations on SML 319.
These have been forwarded to CMS Adelaide for assay.
It is apparent that the formation (See sketch) runs in a general NNE direction spiltting into two at Carriton. The left heading Nth.West through Rhonnda Mine etc. The right leading to Oladdie where we have found good samples and on to Wilchata where the owner of the land has found Native Copper and Cuperite.
Samples have been taken from close to Eurlia Cemetery to points 2 to 3 miles north and we know that good samples await at Colliny Springs 1 to 2 miles to the north again.
Work has been fairly extensive but no real attempt to seek the source of the surface traces has been made. Shallow crossstiens have been cut but there has been no tunnelling or shafting.
Chappelle and Chadwick have traversed this area on foot a number of times finding further workings confirming the fact that there are two distinct seams following the rigges.
E.R.Chadwick a local prospector in our employ has many years of experience in locating and naming minerals, together with an inestimable knowledge of local and adjoining geological and mineralogical structures.
He has at least 45 years knowledge of conditions,workings,history and facts.
He is of the opinion that we should continue to peg along the lines shown to Wilchata and it is my intention to do this as his services and time allows.
We have not to date,been able to prospect south of Eurelia but here again Chadwick assures that traces similar to those already found exist throughout the length of the SML.
Drillings on the Manggnese strike (See Fault line) are proving to be much more extensive than supposed from the surface indications.
There are a number of similar tracings of Manganese paralleling and mingling with the Copper throughout the areas mentioned above.

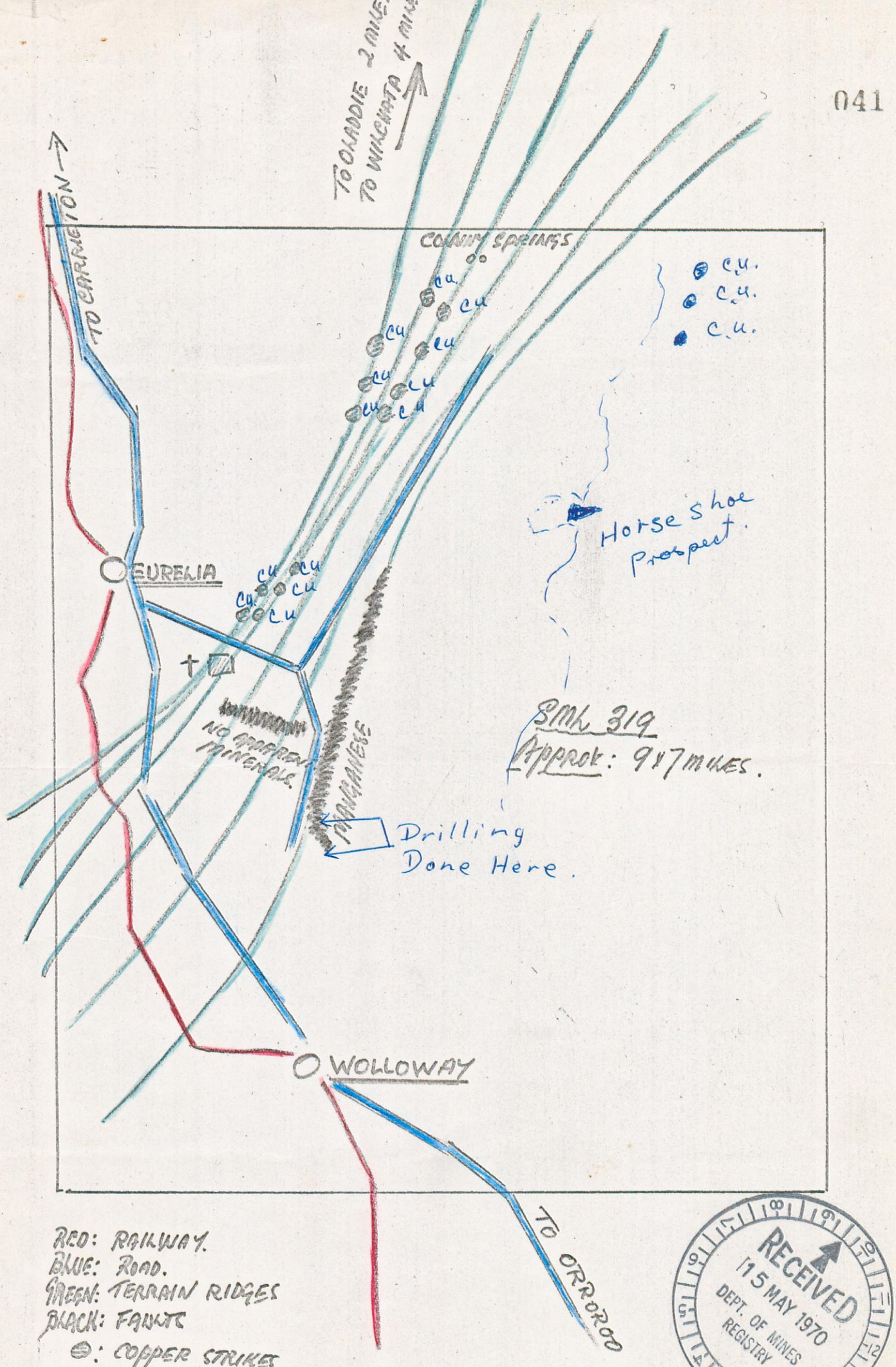
* A look at the geological map will show that this terrain continues North through the Prince Alfred and Helen mines and on to Eucaby Hill a known area of at least 60 miles.

J.E.C.

16

March 1st 1970.
General Survey, Prospecting, & Sampling, on Jeddas S.M.L. 4m ORRORoo.
This work was carried out on the W. or Eurelia side of the ranges in Mannings Paddock.
A lode of low grade Cu. ore occurs in a greyish and pinkish shale slate. Strike N-S Dip 85° W Appr. Exposed at S end by previous dozing & also at several places along line of lode for approx. 3 mile width approx 5-6 feet.
Possibly assays on average 3% to 6% with small pockets of very rich Chalcopyrite, Tetrahedrite, Cuprite Malachite & Azurite.
Well worth working

E.B.
18/3/70.



ENV. 1123

ENV 1123

CMS

192 MAGILL ROAD
NORWOOD, S.A. 5067

BOX
NORWOOD P.O., S.A. 5067

TELEPHONE 32 1708 OR 31 3019

CENTRAL MINERALOGICAL SERVICES

29.9.69

The Manager,
Jedda Explorations Pty., Ltd.,
Melbourne,

FIELD ASSESSMENT IN THE ORROROO AREA
(Typewritten report to Follow)

Introduction:

A number of barite and copper prospects were examined to the north and east of Orroroo.

HORSESHOE PROSPECT (in 65 sq.m. S.M.L.)

This area contains significant barite mineralization but only traces of copper. The prospect is located 12 miles directly north of Orroroo in the foothills of a prominent chain of hills trending approximately north-south. The S.A. Mines Department 4-mile Orroroo sheet indicates rocks of Torrensian age overlain, to the west, by younger Sturtian rocks.

In the area surrounding the barite veins the rocks range from fine-grained, well-bedded dark grey shales to brown, grey and green dolomitic rocks.

As indicated in figure 1. the survey has defined a contrasting relationship between various dip readings taken across the stratigraphic section (east-west). The most easterly beds outcropping in the sequence are green and grey slates as well as buff and grey-buff dolomites. These rocks dip to the EAST at angles between 25° and 30°. Approximately 250 yds west of the foothill outcrops (which overlook the Oladdie Plain) the bedding abruptly changes to dips of 20° to 25° to the WEST. All the beds in the area strike approximately north-south parallel to the range of hills.

Although a more thorough survey would be required to clarify the geology of this area the immediate inference is a fault contact between the differently dipping beds (which change within a matter of tens of feet). A fault is suggested in preference to an anticlinal fold because of the abruptness of the change in dips and instead of an unconformity because rock types throughout the

sequence are identical. The green slates are well bedded and cleavages are steeply dipping to the west, or nearly vertical. The dolomitic rocks are fine grained and massive in fresh hand specimens but weathered examples do show obvious bedding.

MINERALIZATION:

Barite is the major mineral of importance at the Horseshoe Prospect. Only traces of malachite were observed in association with the barites and samples of dolomite containing arsenopyrite segregations were collected. The latter should be tested for gold content.

The barite is invariably associated with quartz in reef-like veins, commonly parallel to bedding in both the easterly and westerly dipping sequences. However probably the most important barite vein occurs on the eastern side of the foothills overlooking the Oladdie plains (and north 150' from the small gully cutting through the sequence). This vein does not

appear to follow bedding and outcrops along a line trending up over the hill to the North-west (345° approximately). It's exact orientation is difficult to determine but it appears to dip vertically. The vein is at least 10 feet wide over an uphill outcrop length of 30 to 35 feet. Both quartz and specular hematite are associated with the vein but segregation within the leader has caused the lower (and wider) portion of the vein to be mainly barite, with a little hematite. While further up the hill (for 50 to 100 feet) quartz is the dominant constituent. For reference on figure 1 this area is called <u>location A</u>. Smaller quartz barite leads parallel to this larger vein outcrop some 25 yds further west on the north side of the small gully through the section.

Location B (figure 1) is quite an extensive outcrop of quartz and barites in the westerly dipping sequence of sediments. In this

zone of mineralization, and at locations C, D, [illegible], The barites is invariably enveloped in a quartz layer both below and above the barite veins. The barite is usually less than two feet wide but at location C1 where it is intermixed with hematite as well as quartz it may be up to 4 feet wide. The quartz associated with these barite leads commonly reaches one to two feet in thickness on either side of the barite. At location C1 an 20' adit has been driven into the hill in a southeasterly direction and a winze has been sunk within ten feet of the portal. A short (6ft.) adit some 100-150 feet south of this adit, Location C2, contains traces of malachite and directly above this area on the hillside (to the east) and beyond the overlying quartz-barite vein the arsenopyrite in dolomite was found. Both leads in this area are in easterly dipping beds. An adit dipping into the hillside in a

westerly direction has been driven across the upper quartz barite lead (Location D1) and location D2 may well be on the same lead cutting back through the hillside overlooking the Paddie Plain but on the southern side of the gully which transects the sequence. The two shafts sunk at Location D2 have also intersection minor amounts of secondary copper minerals (malachite).

Recommendations:

Location A is probably the most significant of the barite-bearing areas and is obviously a first choice for open cut work.

Location B would be the next most accessible and useful area to open up by bull-dozer, especially its more southern extremities. However the quartz content of this lead would make the economic content a little doubtful ~~unless~~ unless selective extraction of the barite could be achieved e.g. by

hand sorting. Locations C and D are more inaccessible and of even more doubtful value because of associated quartz but preliminary open cutting of their lower extremities in the gully cutting through the section would be advisable.

Further systematic geological mapping would help clarify trends of barite veins in the area.

RCH

UNNAMED COPPER PROSPECT (on 65 sq. mi SML)
(Approx. 2 miles north of the Horseshoe)

Host rocks in this area are grey slates exhibiting fine bedding features. The bedding trends east-west (Strike 280°, dip 40° S), but cleavage runs almost at right angles to this direction (strike 210°, dip 75° E). A deep shaft (>150ft) has been sunk at the intersection of these two major structural features at what is best described as the south-east "corner".

Gossanous zones follow both of these directions to the north and west of the shaft. The zone to the west, parallel to bedding, is four to six feet wide but the northerly trending zone (parallel or nearly so to cleavage) varies from fifteen to twenty feet in width.

Mineralization:

Only secondary copper carbonates were observed in the gossanous material

and in the dump material around the shaft. Quartz is the major mineral apart from limonitic iron oxides in the gossans and it is this mineralized quartz reef which aparently held the ore values. The shaft has a reported depth of 270 feet and further cross-drives at depth but these underground workings were unobservable.

Recommendations:

1. Geochemical sampling of the shallow soil profile may give indications of the extent of the mineralisation other than that associated with gossan zones. A grid should be laid out parallel and at right angles to the bedding direction before systematic soil sampling is undertaken.

2. Open cut work would be of no benefit on this prospect.

3. A Self Potential survey could be the most appropriate method for determining the extent of sulphides at depth.

Rhondda Mine

This deep shaft and associated workings are to be found approximately 500 yards east of the road from Carrieton to Carrieton East and 4 miles from Carrieton (See Orroroo 4-mile geological sheet).

The host rocks for the copper mineralization are pyritic black shales striking 305° and dipping 42° NE.

A very deep shaft (>150 ft.) has been sunk on the line of mineralization and a smaller "air" shaft occurs 200 ft across strike to the north-east.

Large quantities of pyrite are present in the gossanous material from the dump around the main shaft and only minor copper carbonates were observed.

Recommendations:

1. Soil Sampling on a grid pattern parallel to the pegged claim i.e. parallel to bedding, should indicate any anomalies which

could occur down dip (to the NE).

2. A Selp Potential survey over any geochemical anomaly may indicate whether mineralization is present in more than one zone (or lens-like body). Care should be taken with interpretation in case other pyritic shales are present. These may give anomalies although their base metal content need not be great.

Scott

EAST OF ORRORDO

Some 15 miles to the east of Orroroo a number of copper prospects, including the "Burnt Pussy" and the "Wade Copper Mine" are located in a northerly trend range of hills containing rocks of similar age to those near the Horseshoe Prospect.

The host rocks at the Burnt Pussy prospect are Sturtian Tillites underlain by fine-grained tillite(?) forming the top of that sequence and these are conformably overlain by sandstones.

A fifteen foot shaft of which a 30 foot northerly trending drive has been excavated follows the line of mineralized quartz. The quartz at the surface is approximately one foot wide but on either side the tillite has been strongly altered and iron enriched (not exactly the same as gossan). The quartz contains primary chalcopyrite, partly altered to iron oxides and

copper carbonates. The quartz vein follows parallel to the bedding which strikes at 80° and dips 20° N. A strongly developed cleavage strikes north-south and dips 55° W.

In the overlying quartz sandstone to the west of the shaft, near the top of the ridge numerous ± inch to 18 inch quartz veins containing pyrite are present cutting across the sequence.

Recommendations:

1. Open cutting by bulldozer in the area of the shaft would probably give a clearer indication of the extent of the mineralized quartz lode.

2. As an alternative, drilling short holes over the area north and west of the shaft should clarify the extent of the mineralization. These holes should be vertical or nearly so to intersect the

relatively flat lying quartz leader.

WADE COPPER MINE

This copper showing occurs some one to two miles south from the Burnt Pussy Prospect and here the mineralization is confined to quartz leaders in schistose rocks underlying the thick tillite sequence.

Two short adits have been driven onto quartz leaders which follow the bedding (strike approx. 50°, dip 60-80°W) The bedding has been severely contorted in places and no consistent dips could be obtained. The southern most of the two adits is 25 feet long cutting into the hill along a direction 140° (to the east). Two short cross drives both north and south have been cut (10 feet in length) along the line of the lode.

Costeens above the northern adit (150' N of the southern adit)

trend 150° and follow chalcopyrite-bearing quartz leaders not unlike those at the Burnt Pussy. Minor barite is present with the quartz and traces of malachite are also present in the dump material.

Recommendations:

1. Map the outcrop of quartz leaders.
2. Open cut these chalcopyrite-bearing lodes by dozer to determine their extent and accessibility.

Scott.

UNNAMED PROSPECT 1 – 2 MILES SOUTH OF "WADE COPPER MINE

Host rocks in this area are spotted micaceous schists which strike 110° and dip 30°N

The mineralization occurs in a quartz lode striking 225°-230° and dipping steeply north 65°-80°. The quartz lode follows the cleavages in the host rocks.

Two very deep shafts have been sunk onto the line of mineralization but only carbonates of copper are present in the dump material at the surface. The shafts have now been filled with mullock to 25'-50' from the surface.

A second, and apparently barren, quartz reef occurs approximately 100 yards to the South and outcrops parallel to the mineralized leader.

Recommendation:

1. As the mineralization appears to be confined to the quartz zone its extent would be best

determined by a self Potential survey of the area. Any type of survey of this kind should cover the outcrop of the second parallel reef, even though it does appear barren.

2. Drilling would be necessary to confirm any anomalies obtained by geophysical or geochemical surveys.

Scott