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SML 219

ARKABA

FIRST AND FINAL PROGRESS REPORT TO LICENCE SURRENDER FOR THE PERIOD 1/8/1968 TO 16/4/1969

Submitted by
Electrolytic Zinc Co. of Australasia Ltd
1969

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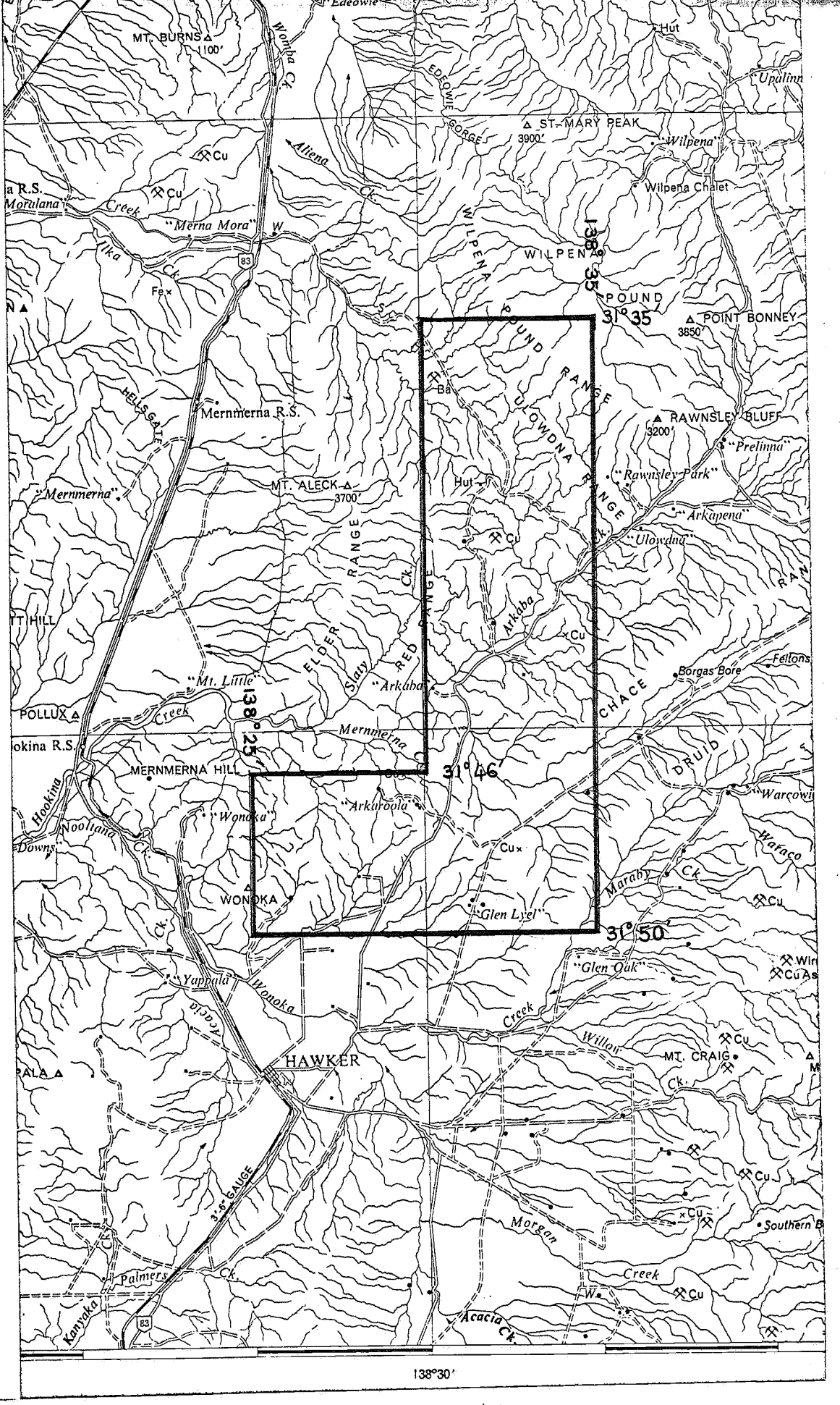
Primary Industries and Resources SA



ELECTROLYTIC ZINC CO. OF A/SIA LTD. &

NEWMONT PTY. LTD.

D.M. 1071/68

S.M.L. 219

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TENEMENT: S.M.L. 219

TENEMENT HOLDER: Electrolytic Zinc Co. Australiasia Ltd and Newmont Pty. Ltd.

REPORT:

Plans:

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ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED

and

NEWMONT PROPRIETARY LIMITED

FINAL REPORT ON

SPECIAL MINING LEASE 219,

ARKABA AREA, SOUTH AUSTRALIA.

by

R. B. Wilson
Project Geologist

12th February, 1969

C O N T E N T S

ACCOMPANYING MAPS.

Plate 1.	Locality Map , SML 219, South Aust. Scale 1:250,000	A 116-1 EZN 124
Plate 2.	Arkaba Area - Reconnaissance Radiometric Traverses with Regional Geology (after S.A. Geol. Survey) Scale 1" = 60 chain	CA 116-2 EZN 125

I INTRODUCTION

Special Mining Lease No. 219, South Australia, in the southern Flinders Ranges, is bounded by the following co-ordinates:-

N.W. Corner	31°35'S;	138°30'E
N.E. Corner	31°35'S;	138°35'E
S.E. Corner	31°50'S;	138°35'E
SW. Corner	31°50'S;	138°25'E
Thence northerly to a point	31°46'S;	138°25'E
thence easterly to a point	31°46'S;	138°30'E
thence northerly to the Datum Point	(31°35'S;	138°30'E).

The area was acquired principally for uranium exploration, in lieu of a larger area originally applied for in the Hawker-Willochra region, in which some anomalous radioactivity was known in association with old copper-workings.

Special Mining Lease No. 219 is situated between the township of Hawker in the south and Wilpena Pound to the north. It was considered that several copper showings near the margin of the Arkaba Diapir may be worthy of investigation for possible uranium associations.

II GEOLOGY.

Special Mining Lease No. 219 contains outcrops of Upper Proterozoic to Lower Cambrian sediments belonging to the Umberatana, Wilpena and Hawker Groups respectively.

A major domal-axis between the Elder Range and Wilpena Pound in the north and between the Elder and Chace Ranges toward the south, has been intruded by the Arkaba Diapir, which consists of brecciated rocks belonging to the Callana Beds of Willouran age.

A. STRATIGRAPHY.

The various units of the Umberatana Group are exposed in the core of the major domal fold, the axis of which runs northerly and thence northwesterly through the central portions of Special Mining Lease 219.

According to Dalgarno and Johnson ("Diapiric Structures and Late Precambrian to Early Cambrian Sedimentation in Flinders Ranges, South Australia" - from "Diapirism and Diapirs" - a symposium, American Association of Petroleum Geologists, 1968), carbonate units of the Umberatana Group are lenticular marginal to the structure, while equivalents of the Marinoan glacial unit at the top of this Group, show marked facies changes from sandstone to boulder conglomerate.

The various units of the Wilpena Group overlie the central domal core of Umberatana Group rocks, as portion of the western and eastern limbs of the dome. The uppermost unit of the Wilpena Group is the prominent ridge-forming Pound Quartzite which forms the Elder Range, Wilpena Pound, Chace and Druid Ranges, in the vicinity of Special Mining Lease 219.

The basal Parachilna Formation of the Hawker Group, overlies the Pound Quartzite of the Chace and Druid Ranges, but is only poorly exposed in this area. The overlying Wilkawillina Limestone is also poorly outcropping within the Lease-area.

The material of the Arkaba Diapir itself is essentially a diapiric breccia with fragments and rafts of dolomite, siltstone and sandstone. These rocks probably belong to the Callana Beds of Willouran age.

B. STRUCTURE.

The principal structure is the north to northwest-trending domal axis, which has been pierced by the Arkaba Diapir, consisting of Callana Beds of Willouran age.

A flanking syncline, the axis of which lies between

the Chace and Druid Ranges, as developed in the Pound Quartzite and overlying Hawker Group, is exposed in the southeastern corner of the area. The diapiric material has intruded members of the Hawker Group in this area.

Faults are fairly common in the more competent lithologic units and generally trend approximately normal to the axis of the major domal fold, with one or two exceptions. Barytes mineralisation is associated with a highly faulted zone in the Moralana area. , Dalgarno and Johnson (reference above) state;- "Faulting synchronous with deposition of the Wilpena Group is evident from facies changes in the southwestern corner of the area."

III RADIOMETRIC PROSPECTING.

Radiometric prospecting was accomplished initially by vehicle-traverses along all roads and tracks as a preliminary to reconnaissance ground-traversing, which was controlled by the use of airphoto enlargements (scale 1" = 2000 feet).

A. VEHICLE TRAVERSING.

Radiometric traversing was accomplished by vehicle traverses along all navigable roads and tracks, using a SCINTREX B.G.S.1 Scintillometer, which was also used for subsequent ground-traversing. The scintillometer was rested on a foam-plastic cushion in the window of a 4-wheel-drive vehicle, whose speed was kept to between 5 and 10 m.p.h.

This method has been used successfully in other areas, the Scintrex normally giving a particularly steady reading over "background" areas and easily detectable fluctuations over anomalous areas.

However, in the Arkaba area, this method was used to traverse approximately 75 miles of roads and tracks, with "background" varying between 20 and 40 c.p.s. Due probably to similarity of rock-types in the areas covered by navigable roads, no significant changes in "background" radiation were apparent for the various lithologic units.

No anomalous areas were detected.

B. GROUND TRAVERSING.

Ground traverses were controlled by identifying points of easy recognition on airphoto enlargements at a scale of 1" = 2000 feet, spaced some 1/4 to 1/3 mile along the traverse lines. Control between these points was obtained by pacing methods in the event of any anomalous radioactivity being detected.

Recording of average radiometric readings between control points was done on squared paper using a scale of 20 or 50 paces per inch.

1. Moralana Barytes Area.

The old Moralana barytes workings are situated in the northwestern corner of Special Mining Lease 219, where the barytes is associated with several northeast-trending faults, which in turn appear to have controlled the emplacement of a small diapir along the same regional anticlinal axis as the main Arkaba Diapir.

All old workings and the faults themselves were closely traversed, but no significant anomalies were detected. Average radiometric readings varied from 20 to 40 c.p.s.

2. Arkaba Diapir.

The major structural feature of the area, the Arkaba Diapir, is some 9 miles north-south with varying widths up to 3 miles east-west. It consists of diapiric breccia with fragments and rafts of dolomite, siltstone and sandstone.

The area occupied by the Arkaba Diapir is mainly gently undulating country with generally poor outcrop, while the lower parts are extensively alluviated.

Ten east-west ground traverses, spaced approximately 1 mile apart and totalling some 20 miles in length, were walked across the diapir and extended into the surrounding host-sediments. Average radiometric readings were very low, ranging from 20 c.p.s. to a maximum of 60 c.p.s.

Evidence of only very weak secondary copper mineralization was seen in shallow workings on the northernmost traverse and no anomalous radioactivity was recorded. Two minor copper occurrences near the southern margins of the diapir were not located during this programme.

3. Tindelpina Shale.

Short east-west traverses at approximate ¼ mile spacing were conducted across the Tindelpina Shale Member of the Tapley Hill Formation. This member is lithologically carbonaceous shale, sometimes dolomitic and pyritic. Radiometric "background" over this unit varied from 20 to 45 c.p.s. and no significant anomalies were located.

4. Parachilna Formation.

The Parachilna Formation, by analogy with other areas, was also a target for radiometric prospecting.

However, outcrop of this formation, situated between the resistant Pound Quartzite and the Wilkawillina Limestone, while generally poor throughout the Flinders Ranges, is almost non-existent in the southeastern corner of Special Mining Lease 219. The Parachilna Formation is generally largely obscured by heavy screes from neighbouring ranges composed of Pound Sandstone and in some areas, particularly immediately east of Glen Lyell Homestead, it is completely blanketed by heavy alluvium-cover.

Traverses spaced at ¼-mile intervals were walked across the Parachilna Formation. Minor exposures were found in steeply-incised gullies, and occasional readings of up to 80 c.p.s. were obtained, but only over very limited areas. On some traverses a general rise in "background" was noted on crossing from the Pound Sandstone to the Parachilna Formation.

However, no significant anomalous zones were discovered within this formation.

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IV CONCLUSIONS AND RECOMMENDATIONS.

The above-described programmes of both reconnaissance and more detailed radiometric traversing by vehicle and ground-methods, have failed to reveal any significant anomalous radio-activity warranting further investigation.

While the total area of Special Mining Lease 219 has not been prospected in detail for surface radiometric anomalies, the more prospective formations and structures have been reasonably thoroughly covered. The resultant lack of encouragement from this reconnaissance programme and lack of targets for more intensive investigation, suggest that Special Mining Lease 219 be relinquished.

R.B. Wilson
Project Geologist.

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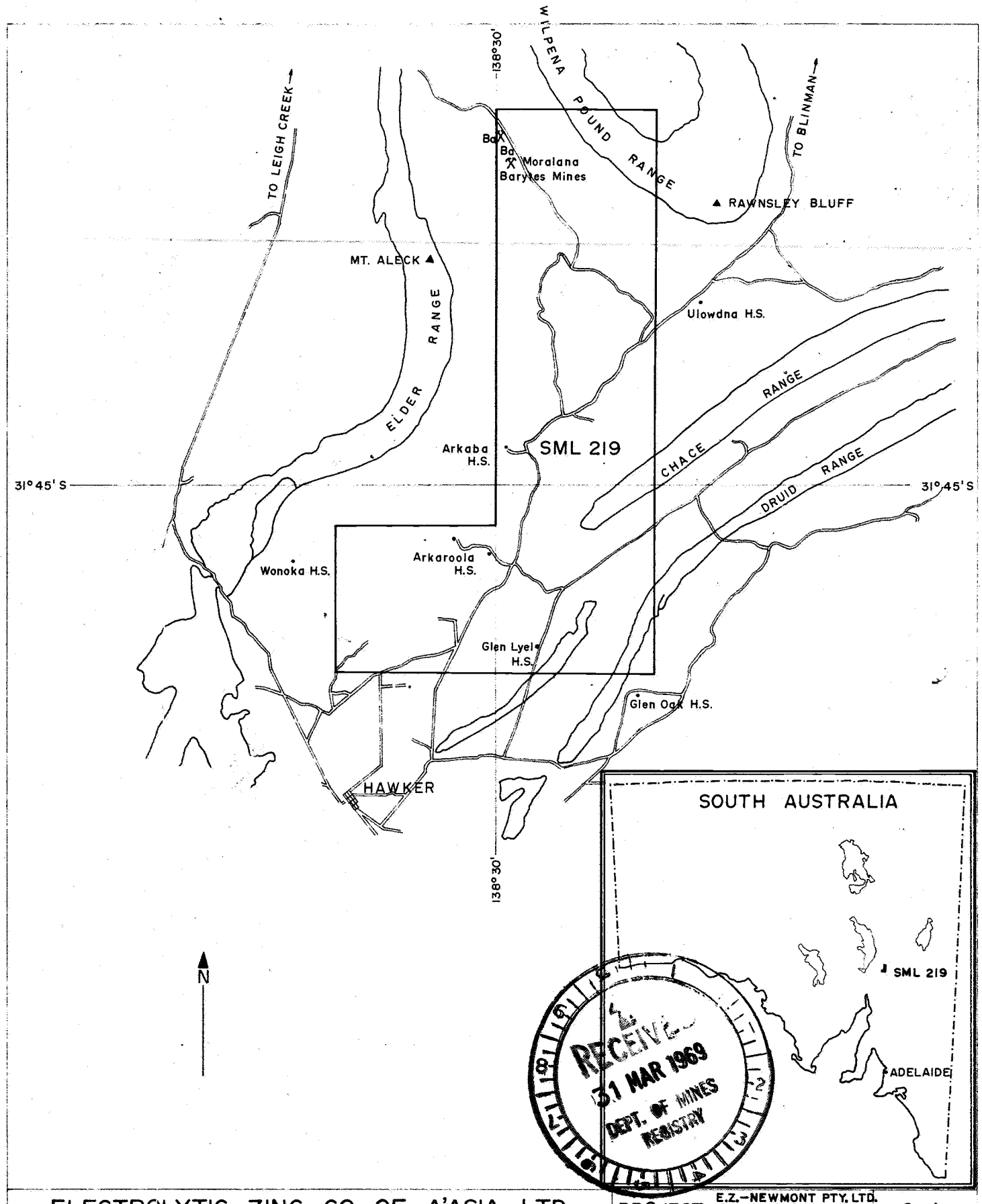
12th February, 1969



ELECTROLYTIC ZINC CO. OF A'ASIA LTD.

PROJECT: E.Z.–NEWMONT PTY. LTD. SML 219 (ARKABA) S. A.

SCALE: 1:250,000	Survey	LOCALITY MAP SML 219, SOUTH AUSTRALIA	REF. NO. A116-1 EZN 124 PLATE 1
Reference			
Date Feb. 1969	Drawn R.G.	Checked	

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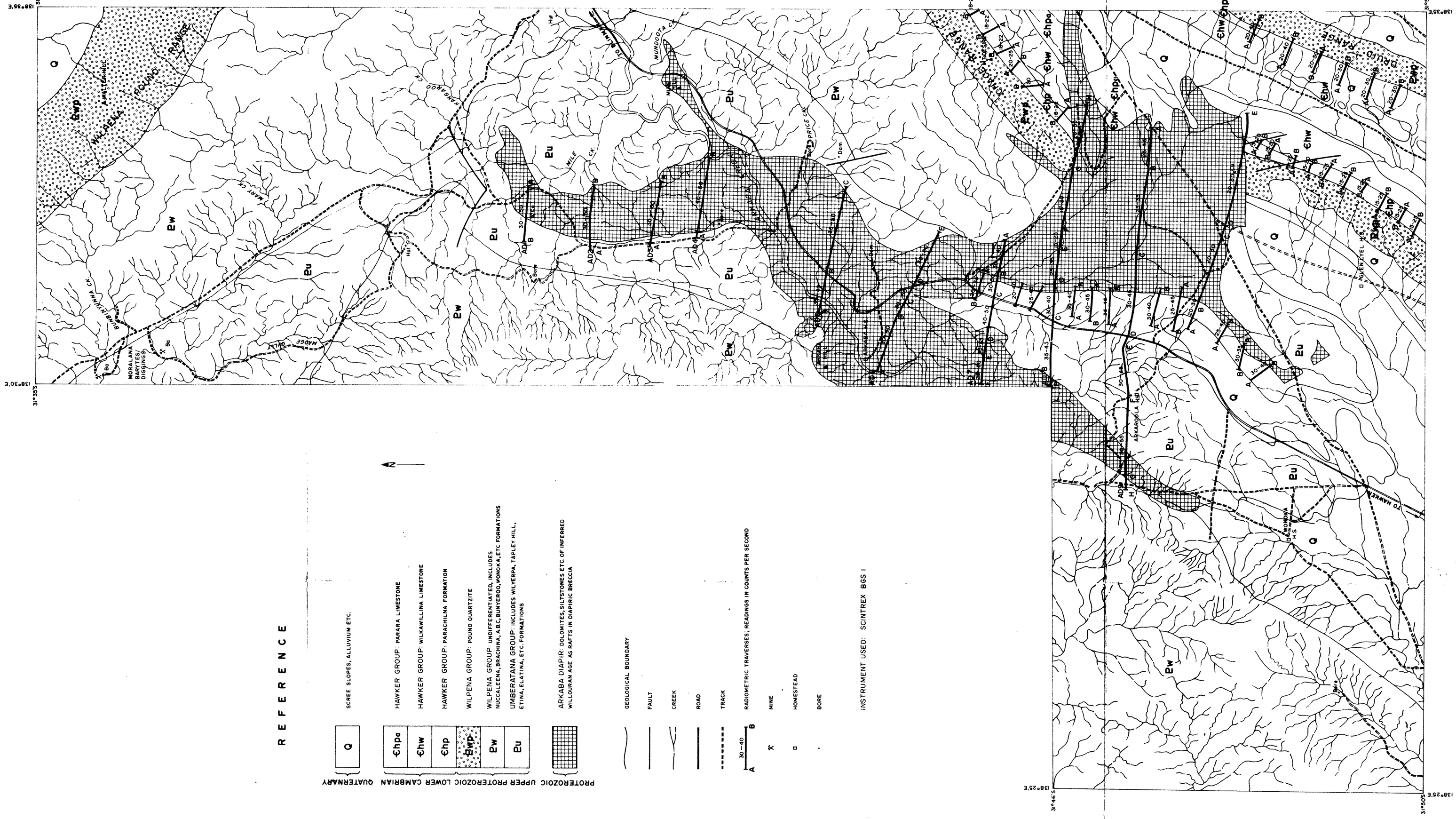
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31°50'S
Ewp
WILPENA POUND RANGE
Q
Ew
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Ehw
Ehp
Ehpa
MARY CK
NADGE GULLY
BUNGAWALYNNA CK
MORALANA PROSPECTS DIGGINGS
ANGAPOO CK
WILLOURAN RANGE
MUNDOOTA CK
WILE CK
PRICE CK
ARKABA FAULT
ARKABA HS
HOMESTEAD
ROWLEY WELL HS
DEMONDA H.S.
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