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CRA EXPLORATION PTY. LIMITED
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Final and First Annual Report
For The Period Ending 14 June 1996
EL 58/94 Mole Creek East, Tasmania

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Licence Holder: CRA Exploration Pty. Limited

Submitted to: Chief Geologist, Vic/Tas

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CRAE - Vic/Tas District
CRAE - ETIG

Submitted by:



Accepted by:



96-3872

FINAL AND FIRST ANNUAL REPORT
TO JUNE 1996 EL 58/94 MOLE CREEK
EAST - CRA - MENPES SA

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CRAE Report No. 21995

Abstract

CRAE acquired EL 58/94 to explore mapped Gordon Group carbonates in the Mole Creek area for Irish-style zinc mineralisation.

A data review was carried out and the knowledge of a recognised carbonate expert for the Mole Creek area was utilised. This work has not identified areas for focussed exploration as:

- The Chudleigh Subgroup carbonates in the Mole Creek East licence area are generally obscured by an unknown thickness of Jurassic dolerite, Tertiary basalt and Quaternary alluvials, and reconnaissance RAB or aircore traverses would be necessary to systematically sample the concealed carbonates and identify geochemically anomalous zones.
- A geochemical database for the concealed Ordovician carbonates does not exist (previous companies have not explored the Mole Creek East licence for carbonate hosted Pb-Zn deposits as relatively low cost reconnaissance exploration methods are not effective).
- Ordovician growth faults that may have acted as conduits for mineralising fluids and hence control the distribution of Pb-Zn mineralisation (ic. "Irish style") are not known in the Mole Creek East licence area.

The Mole Creek East licence is therefore considered lower priority than other licences held by CRAE hence the licence has been recommended for relinquishment.

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Plan No.	Title	Scale
Tv 874	EL 58/94 Mole Creek East Location Plan	1:100,000

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1. Conclusion and Recommendation

The following conclusions are drawn from work carried out during permit year one of the Mole Creek East licence area:

- Ordovician growth faults that may have acted as conduits for mineralising fluids and hence control the distribution of Pb-Zn mineralisation (ie. "Irish style") have not been recognised in the Mole Creek East licence area.
- The Chudleigh Subgroup carbonates in the Mole Creek East licence area are generally obscured by an unknown thickness of Jurassic dolerite, Tertiary basalt and Quaternary alluvials. This will impede geochemical sampling to identify targets.
- Previous companies have not explored the Mole Creek East licence for carbonate hosted Pb-Zn deposits as relatively low cost reconnaissance exploration methods (stream sediment, rockchip and hand auger soil sampling) are not effective.

Work carried out during the first permit year has not identified target areas within the concealed Ordovician carbonates. Hence a systematic regional geochemical sampling programme is required to identify geochemically anomalous areas and generate drilling targets. Reconnaissance RAB or aircore traverses would be necessary to systematically test bedrock through the variable cover sequences. The Mole Creek East licence is considered lower priority than other licences held by CRAE. Consequently the licence has been recommended for relinquishment.

2. Introduction

The Mole Creek East EL 58/94 was granted to CRA Exploration Pty. Limited (CRAE) on 14th July 1995. The licence covers 236 sq km (Plan Tv 874) and lies 40 km west-south west of Launceston.

CRAE acquired the licence area to explore for economic, Irish-style Pb-Zn mineralisation in the Ordovician Gordon Group carbonates. CRAE's preceding exploration of the Gordon Group carbonates in the Zeehan area has resulted in several very encouraging Pb-Zn intersections. Hence CRAE has expanded exploration efforts to other areas of poorly explored Gordon Group carbonates with potential to host economic Irish-style Pb-Zn mineralisation. The Mole Creek East licence area satisfies these criteria.

This report details all exploration activities conducted within EL 58/94 Mole Creek East by CRAE during the first permit year ending 14th June, 1996.

3. Review of Previous Work

Exploration carried out prior to the current licence is summarised below:

Kentish Hill 1921-1923

At Kentish Hill near Quamby Brook, low grade copper carbonates were discovered at surface in 1921. A report by Reid (1923) on the results of minor prospecting operations indicates that the mineralisation occurred in mafic rocks ("gabbro") with grades of 0.3% Cu with minor Au, Ag and Ni. A syndicate was formed to prospect the deposit but little progress was made.

T.W Davies Syndicate EL ? 1970-1971

T. W Davies Syndicate drilled six vertical diamond holes to test down-dip extensions of the Kentish Hill mineralisation. The best intersection was 46.5m at 0.18% Cu.

Union Oil EL 15/75 1975-1976

Union Oil carried out some B and C horizon soil sampling over the Kentish Hill prospect. This work indicated weakly anomalous Cu, Zn, and Ni.

Comalco EL 17/76 1976-1979

Comalco's EL 17/76, situated in the vicinity of the small township of Deloraine, included the north-eastern portion of the current Mole Creek East Licence area.

Comalco acquired EL 17/76 to explore for tin-fluorite skarn, ^{Cyprus} type Cu deposits and polymetallic VMS deposits in mapped Cambrian volcanics and volcanoclastics. The exploration programme included regional geological mapping and comprehensive -80# stream sediment geochemical sampling with analyses for Cu, Pb, Zn and some Sn, W.

A number of low order Cu anomalies were associated with the basic volcanics of the Kentish Hill area. Comalco carried out gridding, geological mapping, magnetics, gradient array IP and limited C horizon geochemical surveys. The magnetics showed that the basalts were strongly magnetic and occurred as discontinuous lenses. IP indicated weak resistivity lows along a basalt-shale contact but the lack of associated chargeability features suggested conductive shales rather than a sulphide deposit. The soil geochemical data indicated a peak of 800 ppm Cu with lower associated Zn, erratic Ni to 900 ppm and low Pb over the basic volcanics. Comalco concluded that the prospect had only a very remote possibility for economic ^u Cyprus type mineralisation.

Anomalous W and Sn were returned from stream sediment samples in the Lobster Rivulet-Punches Terror area but no indications of significant W or Sn mineralisation were found. After further investigations the minor W and Sn mineralisation was interpreted to be the result of low temperature solutions originating from a deeply buried granitoid precipitating W and Sn in basic volcanic units.

Two rockchip samples collected from Cambrian clastics-volcanoclastics in the Beefeater Hill area returned anomalous Cu, Ag and Co. Follow up sampling indicated the Co-Ag-Cu mineralisation in quartz veins was the result of Mn scavenging.

Otokumpu Exploration Pty. Limited EL 16/90 1990-1991

Otokumpu acquired EL 16/90 to explore for massive sulphide deposits in the mapped Cambrian volcanics and volcanoclastics.

Initial reconnaissance and very limited petrographic and geochemical studies of the mafic volcanics near Kentish Hill suggested that they may be correlates of the Footwall Andesites of the Que-Hellyer Volcanics. A brief follow up programme involving petrographic work and wholerock major/trace element analysis was carried out to assess the extent and the VMS prospectivity of the mafic igneous rocks in the Kentish Hill area. The mafic igneous rocks were found to include:

- tholeiitic basalts similar to those of EoCambrian trough sequences elsewhere in Tasmania,
- unusual ultramafic cumulates of unknown affinity
- a group of basaltic andesitic to andesitic lavas, shallow intrusives and volcanoclastic sediments

The andesitic group appears to have petrographic similarities to the Cambrian Mt Read Volcanics but the interpretation that they are chemical correlates of the Que-Hellyer Volcanics was not substantiated by the additional whole rock analyses.

The area was concluded to have low prospectivity for polymetallic volcanogenic massive sulphide deposits on the basis of small areal extent, generally low base metal values, and the low sulphur, epidote dominated, vein associated alteration assemblage.

4. Work Completed in the 12 Month Period Ending 14 June 1996

4.1 Literature Review

A review of open file records shows no significant carbonate-focussed exploration in the current Mole Creek East licence area.

The Cambrian volcanic-volcanoclastic sequence outcropping along the north-eastern margin of the licence has been explored for VMS style deposits. A secondary Cu occurrence at Kentish Hill has been repeatedly investigated by explorers.

4.2 Consultant Recommendations

Dr Clive Burrett, a palaeontologist/carbonate sedimentologist from the University of Tasmania with considerable geological knowledge of the Mole Creek/Gunns Plains region, was asked to identify areas in the region with the greatest potential for the development of economic, Irish style Pb-Zn deposits ie:

- Ordovician growth faults that may have acted as conduits for mineralising fluids and hence control the distribution of Pb-Zn mineralisation (although the Chudleigh Subgroup is generally concealed in the licence area, growth faults would be recognised in the outcropping Moira Sandstone/Roland Conglomerate sequence).
- potential sealing units to trap mineralising fluids
- known Pb-Zn mineralisation

Dr Burrett was unable to identify prospective areas within the Mole Creek East tenement. See Appendix 1 (letter C Burrett to S Menpes) for a more detailed discussion.

4.3 Geology

Rocks from Precambrian to Recent age outcrop in the licence area.

Precambrian aged banded quartzite, quartz muscovite schist and phyllite outcrop in the NE of the licence area. These rocks are strongly deformed in contrast to the unconformably overlying Cambrian and Ordovician rocks.

Cambrian rocks (SE limit of exposure of the Fossey Mountain Trough) outcrop along the NE margin of the licence area. The Cambrian sequence includes clastic and pyroclastic rocks in association with both intrusive and extrusive igneous rocks. The presence of thick sequences of greywacke and conglomerate with associated volcanics suggests that rapid deposition occurred in a deepening trough in an unstable environment.

The discordant nature of the contact between Cambrian and Ordovician rocks is demonstrated north of the licence area at Pumicestone Ridge, where quartz sandstones of probable Ordovician age unconformably overlie Cambrian conglomerates.

In the Mole Creek area the dominantly siliciclastic Denison Group is represented by the Ordovician Magog Subgroup (Table 1). The basal Roland Conglomerate (Owen Conglomerate correlate) is overlain by the Moina Sandstone which is in turn conformably overlain by carbonates of the Chudleigh Subgroup (Gordon Group equivalent).

The Chudleigh Subgroup consists of seven mappable units which comprise 1300m of limestones and a minor siliciclastic unit. The Chudleigh Subgroup is conformably overlain by fossiliferous siltstones and unfossiliferous siliciclastic sandstones of the Eldon Group.

Outcrops of the Chudleigh Subgroup target sequence in the Mole Creek East licence are restricted to

- isolated outcrops south of Chudleigh at the foot of a hill formed by the Permian Kansas Creek Beds and Jurassic dolerite capped by Tertiary basalt
- small outcrops on the northern flanks of Gibsons Sugarloaf
- isolated outcrops on Stockers Plain near Golden Valley

Elsewhere the Chudleigh Subgroup is obscured by an unknown thickness of Jurassic dolerite, Tertiary basalt and extensive Quaternary alluvials.

In the southern licence area an undeformed Permian sequence including sandstones, shales, glaciols and coal measures outcrops beneath the protective Jurassic dolerite cap of the Great Western Tiers.

5. Discussion of Results

A review of previous exploration in the Mole Creek East licence area has not identified areas for follow up exploration. Companies have not explored for carbonate hosted Pb-Zn deposits as the Chudleigh Subgroup carbonates are generally obscured by Jurassic dolerite, Tertiary basalt and Quaternary alluvials. Utilisation of Dr Clive Burrett's knowledge of the carbonates in the region has also failed to generate targets. Hence a systematic regional geochemical sampling programme is necessary to identify geochemically anomalous areas.

The variable cover sequence concealing the Chudleigh Subgroup carbonates would impede relatively low cost reconnaissance exploration methods such as stream sediment, rockchip and hand auger soil sampling. Consequently reconnaissance RAB or aircore traverses would be necessary to systematically test bedrock. The Mole Creek East licence is considered lower priority than other licences held by CRAE, hence the licence has been recommended for relinquishment.

6. Rehabilitation

No field exploration has been undertaken to date.

7. Expenditure

Expenditure during current term: \$6,614

Total Expenditure: \$6,614

8. References

- | | | |
|-------------------------|------|---|
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| Weste, G | 1979 | EL 17/76 Quamby, Tasmania. Final report covering all exploration. TDR 79-1326 |

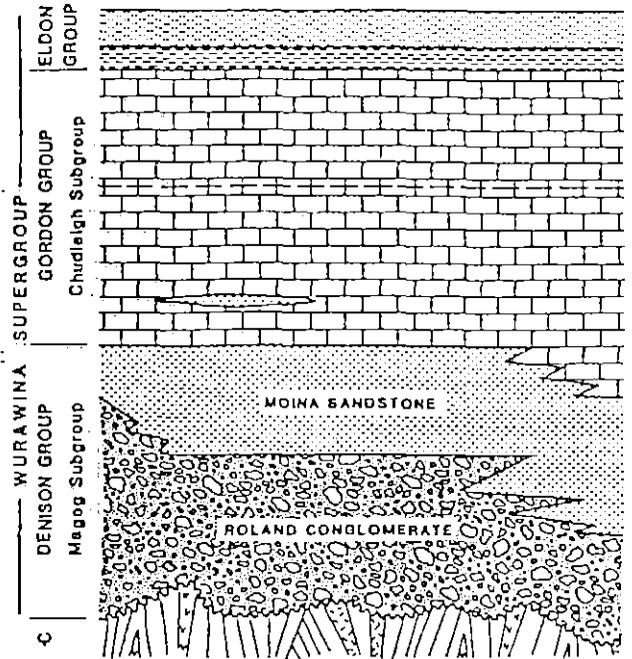
9. Location

Launceston	SK55-04	1:250,000
Mersey	8114	1:100,000
Meander	8214	1:100,000
Deloraine	4640	1:25,000
Quamby Bluff	4638	1:25,000
Mole Creek	4439	1:25,000
Lake Mackenzie	4438	1:25,000
Montana	4639	1:25,000
Gog	4440	1:25,000

10. Keywords

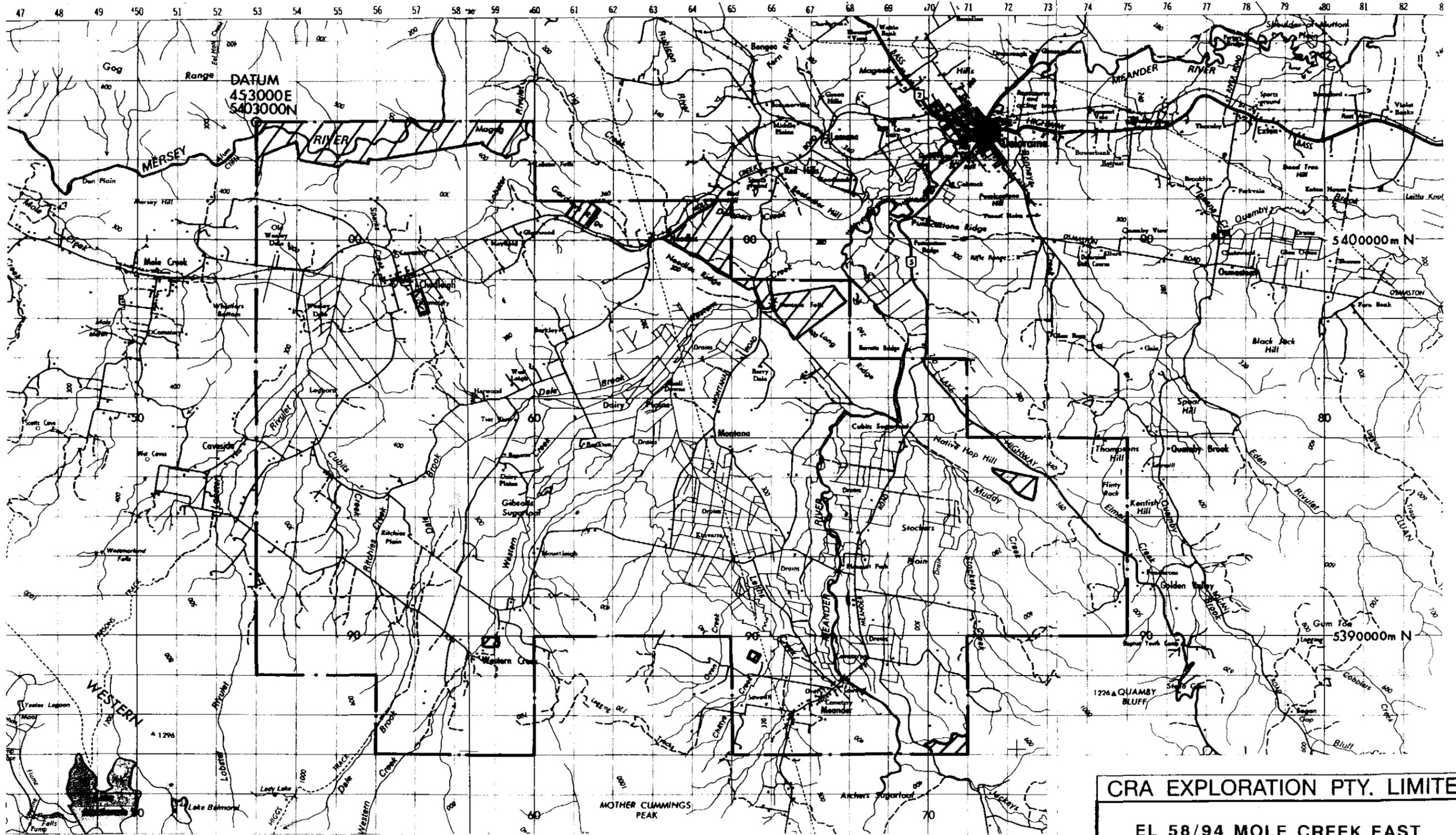
Tasmania, Base Metals, Ordovician, Carbonate Hosted, Review.

Fig. 7 Suggested facies relationships of Denison Group and Gordon Group rocks in the Mole Creek area.

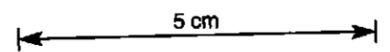
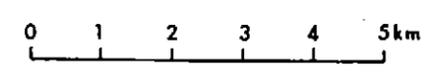


		DENISON RANGE-FLORENTINE VALLEY AREA			MOLE CREEK AREA		
SILICICLASTICS	ELDON GROUP	TIGER RANGE SUBGROUP	McLeod Ck Fm				
			Currawong Quartzite				
			Richea Siltstone				
			Gell Quartzite			Sandstone	
			Arndell Sandstone Fm	Westfield Fm		Siltstone	
CARBONATES	GORDON GROUP	Benjamin Fm	Upper Limestone Member		CHUDLEIGH SUBGROUP	Den Fm	
			Lords Siltstone Member			Overflow Creek Fm	
			Lower Limestone Member			Mole Creek Fm	
		Cashions Creek Formation				Dogs Head Fm	
				Wherretts Chert Member		Sassafras Fm	
		Karnberg Formation				Ugbrook Fm	
SILICICLASTICS	DENISON GROUP	Squirrel Creek Fm	Upper Sandstone Member	Florentine Valley Formation	MAGOG SUBGROUP	Moina Sandstone Fm	
			Siltst.-limest. Member				Mt Field Siltstone Member
			Lower sandstone Member				Pontoon Hill Siltstone Member
		Reeds Conglomerate		Churchill Sandstone Member			
		Great Dome Sandstone Fm		Tim Shea Sandstone		Roland Conglomerate Fm	
		Singing Creek Fm					

Table 1 Lithostratigraphic terminology for Wurawina Supergroup strata.



 EXCLUSIONS



CRA EXPLORATION PTY. LIMITED	
EL 58/94 MOLE CREEK EAST	
LOCATION PLAN	
Ref SK55-3	Scale: 1: 100 000
Author: S.Menpes	Report No.: 21995
Drawn: A.Jelen	Plan No.: Tv 1064

MAY 1996

Appendix 1

Letter from C Burrett to S Menpes

RENO HOTEL
BANGKOK

Report PAD

19/1/96

703014

No.....

Dear Sandy,

I thought about your Mole Cr./Gunn's Plains problem briefly over the Christmas period.

The situation at Mole Creek is similar to Zeehan with a variable thickness siltstone seal in the middle of the limestone sequence. Obvious differences are the presence of a basal 145m thickness of oncolitic limestone (the Standard Hill Fm) and the 240m thick peritidal sequence of the Overflow Creek Fm in the upper part. The Ujbrook Fm is very similar to that at Zeehan and may also have acted as a seal as it is very argillaceous in places.

Sphalerite was found at the eastern end of Standard Hill within the oncolitic Standard Hill Fm and this may be a good place to start looking for Pb/Zn deposits i.e. at about grid ref. DP 465986.

Any solutions passing through the oncolitic Standard Hill Fm would have hit the overlying ~~the~~ Ujbrook Fm argillites and may have deposited. Similarly, it may be worth while thinking about the south side of Standard Hill where the argillaceous/siliciclastic Ujbrook Fm was probably an even better seal.

Gunn's Plains is not very well known and there is very little outcrop in the valley. The upper part of the section is identical to that at Mole Creek - i.e. the Overflow Creek Fm and Den Fm. Below that we have very little information.

Assuming that the Khmer Rouge and land mines don't get me, I will be back in Australia on the 18th February at the AGC in Canberra and back in Hobart on the 25th.

Cheers
Clive