



MEMORANDUM

To: David Pascoe, Head of Technical and Geology
Cc:
Date: September 4, 2023
From: Principal Geologist, Ralph Porter
Report Nº: RXXX.2020
Re: **EL33208 technical advice relating to lithium exploration**

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SUMMARY & KEY RECOMMENDATIONS

West Cobar Metals Ltd (WC1) approached CSA Global to undertake a desktop review of their Hermit Hill Project in the Northern Territory of Australia.

The available data relevant to exploration for rare-element the lithium-caesium-tantalum (LCT) family of pegmatites within EL33208 is very limited. Most information relates to exposed pegmatites at Hermit Hill and based on available rock chip analytical data for Rb and Sr some of these pegmatites are weakly fractionated with slightly elevated Rb and $Rb/Sr > 10$. No other indicators for the presence of LCT pegmatites was identified within EL33208.

The tenement largely covers granitic rocks of the Litchfield Complex with only small areas of older rock sequences mapped within the tenement and these are considered too close to the potential source granite to have high potential for LCT pegmatites.

However, in the Northern Territory Geological Survey (NTGS) Report 16 (Frater, K.M., 2005) the SE portion of the Litchfield Complex is differentiated as the Jamine Granite and this granite, based on its geochemical characteristics, is considered a potential source granite to LCT pegmatites. If this is correct, then there may be some age difference between granite phases within the Litchfield Complex and any pegmatites derived from the Jamine Granite (assuming it is a younger fertile phase) potentially hosted within the surrounding older granite phases. If true, this would increase the prospectivity of EL33208.

Overall while CSA Global is of the opinion that EL33208, based on the data and local geology, has low prospectivity for LCT pegmatites, it has identified several targets that WC1 may wish to follow up. These include:

- Re-sampling the Hermit Hill pegmatites to obtain good quality K/Rb fractionation data
- Re-sampling or re-drilling the pegmatites intersected in previous drilling (Figure 5).
- Bedrock geochemical sampling within the target areas indicated in Figure 5.

It should be noted that deep weathering of bedrock and pegmatites is likely in this region which means that lithium is likely to be leached out and less mobile geochemical indicators such as Sn, Ta, Rb and Cs relied upon.

INTRODUCTION

West Cobar Metals Ltd (WC1) approached CSA Global for technical assistance with their Hermit Hill Project in the Northern Territory of Australia. The project is located within the Litchfield pegmatite belt and is centred about 160 km southwest of Darwin and comprises one Exploration Licence EL33208 covering an area of about 667 km² (Figure 1).

WC1 would like assistance to evaluate available data and provide advice on the geological setting, exploration approach and activities for rare-element the lithium-caesium-tantalum (LCT) family of pegmatites.

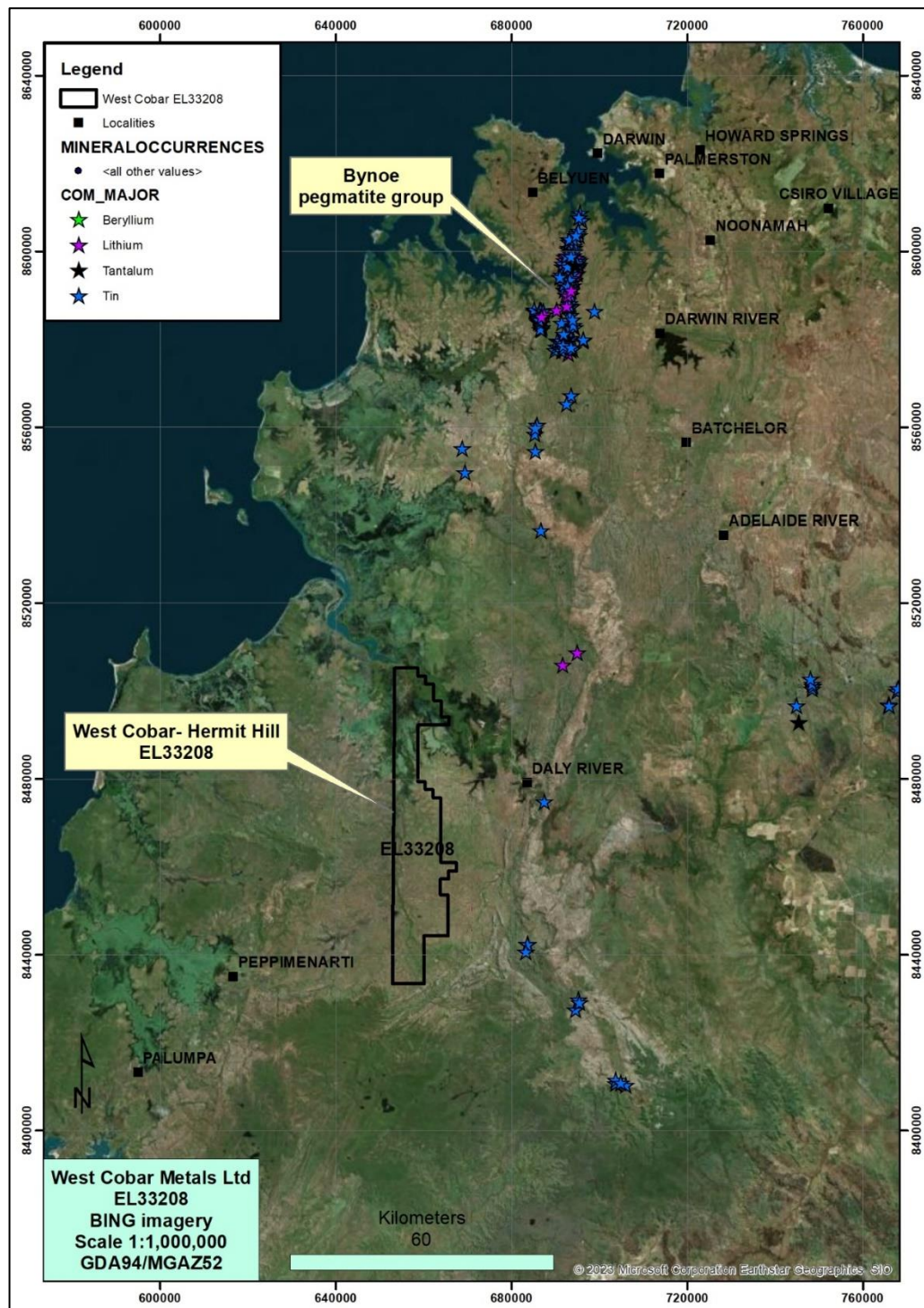


Figure 1. Hermit Hill EL33208 location plan

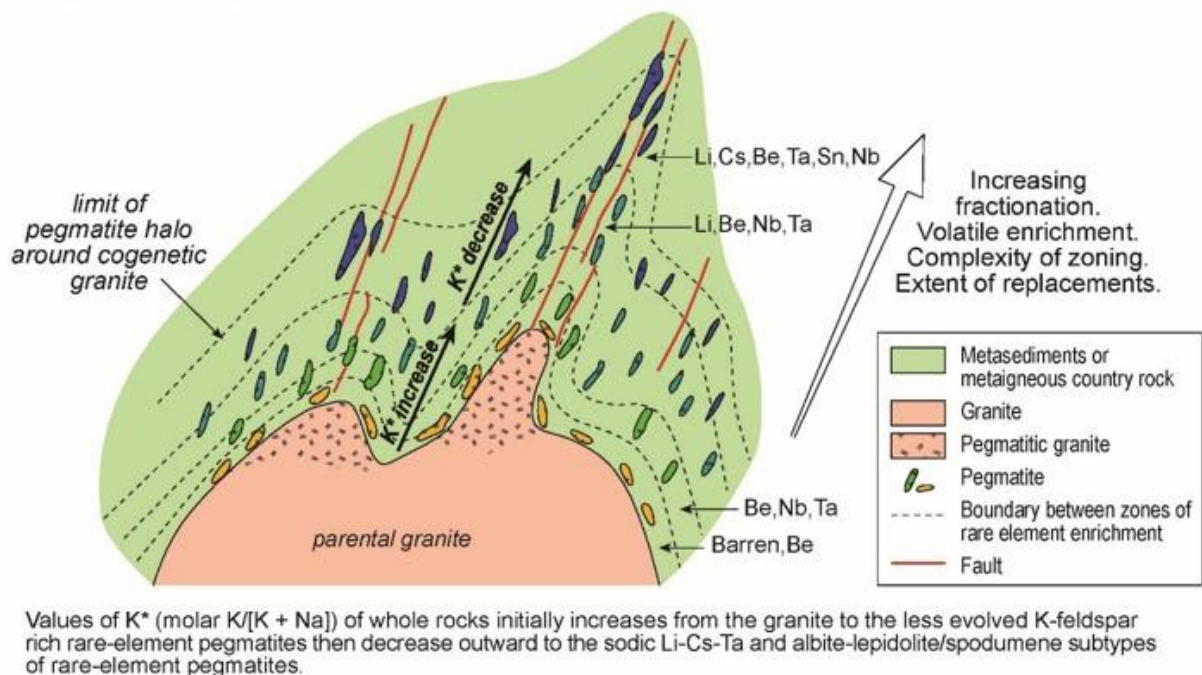
GENERALISED MODEL FOR THE FORMATION OF LCT PEGMATITES

The generally accepted key features of the model for the development of economic LCT pegmatites include:

- A 'fertile' source or parent granite is required – these are typically peraluminous granitic melts derived from crustal rocks which contain elevated elements reflected in the final LCT pegmatites- such as Li, Be, Rb, Cs, Nb, Ta, Sn.
- The granite melt fractionates which means the incompatible elements i.e. the elements that do not easily fit into early crystallising phases or prevent crystallisation accumulate in the residual evolving granitic melt. These include incompatible elements such as Rb, Cs, Nb, Ta and Sn and other components, sometimes described as volatiles or fluxes such as Li, H₂O, B, P and F. The volatile or fluxing components prevent the early crystallisation of the residual melt phases and allow the melt to continue evolving as it moves outward from the source granite.
- Eventually the evolved melts cool sufficiently to form mineralised LCT pegmatites.
- The mineralised pegmatites exploited for lithium are typically emplaced in greenstone belt rocks or older granite/gneiss rocks, with their emplacement focussed within large regional and subsidiary structures up to 10 km away from the parent granite. The distance of emplacement can depend on several factors including melt composition and volume, crustal heat, degree of crystal-melt fractionation and the structural framework.
- There are rare exceptions where lithium mineralized pegmatites are known or interpreted to be hosted within their source granite.

The generalised model is illustrated in Figure 2.

b. SCHEMATIC PRESENTATION OF REGIONAL ZONING IN A COGENETIC GRANITE AND PEGMATITE GROUP



After Cerny P, 1991, Galeschuk C. et al 2007, and London D. 2016.

Figure 2. Schematic representation of regional zoning in a cogenetic granite and pegmatite group

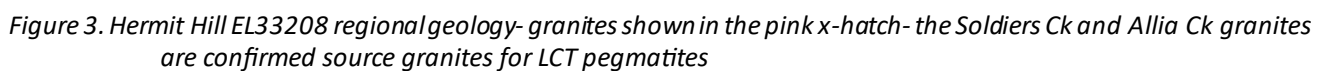
DISCUSSION

Geological Setting

EL33208 largely overlies the Litchfield Complex (Pgl) comprising coarse grained granodiorite and tonalite. No LCT type mineralization is recorded as being associated with this granite complex. To the east of EL33208 the Allia Creek Granite (Pga) and the Soldiers Creek Granite (Pgs), which are both described as S-type muscovite-biotite i.e. 2-mica granites and adamellite, are associated with LCT mineralization (Figure 3).

Northern Territory Geological Survey (NTGS) Report 16 (Frater, K.M., 2005) does differentiate the SE portion of the Litchfield Complex as the Jamine Granite and considers this granite, based on its geochemical characteristics, is a potential source granite to LCT pegmatites.

If this is correct, then there may be some age difference between granite phases within the Litchfield Complex and any pegmatites derived from the Jamine Granite (assuming it is a younger phase) hosted with surrounding older granite phases. However, CSA Global has not seen any descriptions or exact location details of the Jamine granite, and it is unknown if it is similar to the Allia Creek and Soldiers Creek granites.



Supporting Data

WC1 provided their rock chip sample data and associated assays. The majority of rock samples relate to pegmatites exposed in the Hermit Hill area and apparently hosted in the Litchfield Suite (Pgl), although Dan McIntyre indicates some of the Hermit Hill pegmatites are not hosted in granite. While no significant LCT elemental values occur within the Hermit Hill pegmatite samples, the Rb/Sr ratios of > 10 indicates the pegmatites are weakly fractionated.

Denehurst Ltd, under EL5295, held portions of the ground covered by EL33208. Denehurst also collected a few rock chip samples from the Hermit Hill area but did not locate any significant Sn or Ta values (CR19880412).

CONCLUSIONS

The Hermit Hill EL largely covers granitic rocks of the Litchfield Complex which to date has no associated LCT pegmatites. In NTGS Report 16 (Frater, K.M., 2005) the SE portion of the Litchfield Complex is differentiated as the Jamine Granite and this granite, based on its geochemical characteristics, is considered a potential source granite to LCT pegmatites. If this is correct, then there may be some age difference between granite phases within the Litchfield Complex and any pegmatites derived from the Jamine Granite (assuming it is a younger fertile phase) potentially hosted within the surrounding older granite phases. If true, this would increase the prospectivity of EL33208. However, the Jamine granite is not differentiated on NTGS 250 K geological maps, and its dimensions and boundaries are unknown.

Only small areas of the EL contain older rock sequences, but these are considered too close to the potential source granite (Jamine granite) to be lithium mineralized. However, it is not uncommon for Sn \pm Ta mineralised pegmatites to be emplaced within 1-2 km of their source granite.

While CSA Global is of the view that overall EL33208 has very low potential to host lithium bearing pegmatites; WC1 may wish to continue exploration for lithium. The suggested exploration approach is outlined below.

ACTIONS/NEXT STEPS

Exploration approach

Large portions of the EL are apparently covered by non-residual soils (Figure 4) which are not suitable to sample for LCT geochemical signatures, so some other form of geophysical and/or geochemical screening is required. In terms of geochemical screening auger to residual regolith or bedrock and/or drilling to bedrock, using RAB or aircore, are the most likely effective options. It should be noted that in wet tropical areas there can be significant weathering of pegmatites and leaching of lithium to considerable depths, as occurs at Bynoe. In this case greater reliance needs to be placed on resistive components such as Sn and Ta.

Geophysical methods rely on contrasting properties and being large enough to provide a contrast. In suitable host rocks magnetic lows and/or gravity lows may indicate pegmatites. Large lithium mineralized pegmatites may be detected as gravity highs.

The suggested target areas outside Hermit Hill are shown in Figure 5. These areas are largely focused on older rock sequences marginal to the Jamine granite. If possible, the pegmatites intersected in the previous drilling should also be sampled or re-drilled. It is also suggested the pegmatites exposed at Hermit Hill are re-sampled to obtain good quality K-feldspar and mica samples for fractionation analysis using Rb accumulation in K-feldspar. This will provide useful information in terms of their lithium potential. The principal targets are:

- Re-sampling the Hermit Hill pegmatites to obtain good quality K/Rb fractionation data
- Re-sampling or re-drilling the pegmatites intersected in previous drilling (Figure 5).
- Bedrock geochemical sampling within the target areas indicated in Figure 5.

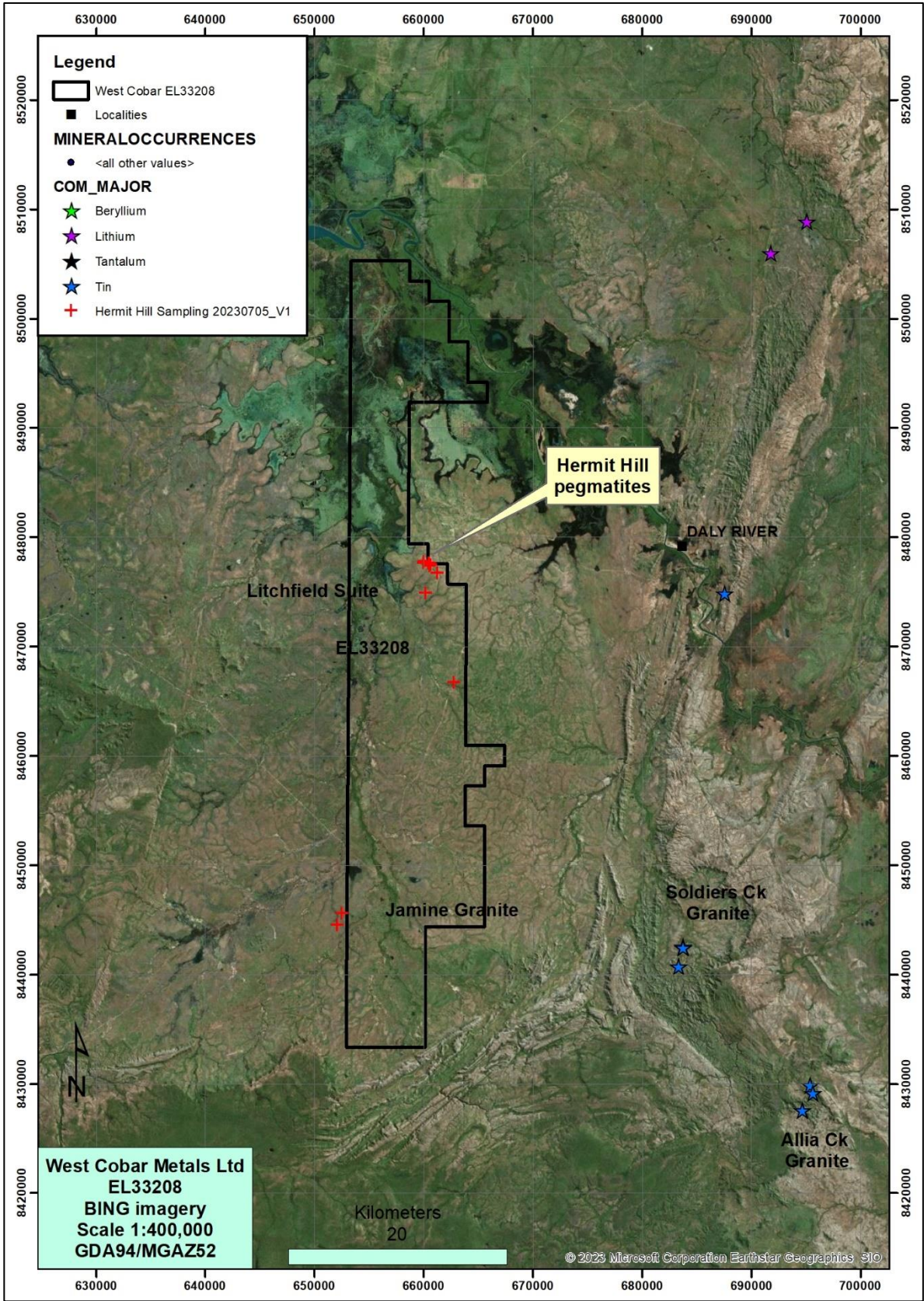
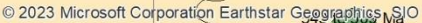


Figure 4. BING image of Hermit Hill EL33208 indicating extensive non-residual regolith



Page 8 of 8