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ELKEDRA DIAMONDS NL

Altjawarra Craton Diamond Project
Toko Target Area

Annual Report for period ending April 30, 2001
For EL's:
22531 (Toko Range)

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Map Sheets:
1: 250,000: Tobermory (SF53-12)
1:100,000: Toko (6542)

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1 INTRODUCTION

Exploration License (EL) 22531 is located on the Tobermory (SF53-12) 1:250,000 sheet in central Northern Territory (Figure 1). A summary of the tenement history is shown in Table 1.

Table 1: Summary of Tenement History.

EL	Tenement	Date of Grant	No Blocks	Total Area (Km^2)
22531	Toko Range	July 16, 2001	500	1,572

Interpretation of Landsat 7 satellite imagery by Dr. Nick Lockett of Nick Lockett and Associates is shown in Figure 2. Physiography consists of elevated, continuous to semi-continuous outcrop plateaus which correspond with the Ashburton Surface with elevations ranging from 500 to 600m above sea level. The vegetation ranges from sparse savanna woodland and annual grasslands to perennial spinifex dominated grassland. The vegetation is consistent with a continental desert regime.

This report details all work carried out on this tenement up to April 30, 2002 by Elkedra Diamonds NL.

2 CONCLUSION

The recovery of a suite of indicator minerals from the Toko target area highlights the prospectivity of the region for alkaline rock sources and confirms earlier open file results. In particular the recovery of high-Cr chromite, picro-ilmenite and Mg-pseudobrookite are all compatible with indicator minerals recovered from kimberlites and related rocks worldwide.

The encouraging results support further exploration in the area. Additional stream sediment samples will be taken in the next reporting period, and pending the release of the Eromanga aeromagnetic survey geophysical anomaly targeting will also be undertaken.

3 GEOLOGICAL SETTING

3.1 Regional Geology

The Altjawarra diamond project is located on the North Australian Craton which represents an amalgamated terrain that was consolidated around 1,800 Ma. From a diamond exploration perspective, the significance of the North Australian Craton is that it hosts all of Australia's diamond mines to date including the recently discovered diamondiferous Merlin kimberlites located on the eastern portion of the North Australian Craton. Of particular importance is the age of the Merlin pipes which have been dated as Devonian (~380 Ma). Elkedra Diamonds are targeting this same kimberlite event, or younger, in the southern Georgina Basin located south of the Merlin field.

The project area incorporates several kilometers of Cambro-Ordovician platform sediments of the southern Georgina Basin, which wholly veneer a basement continental block referred to as the Altjawarra Block. The southern Georgina basin and the underlying Altjawarra Block in particular, are associated with a zone of anomalously thick lithosphere extending to at least 200km depth as recognized from recent seismic tomography studies (Kennett, 1997; Van der Hilst *et al.*, 1998; Debayle and Kennett, 2000). The geophysical data highlight the area as highly prospective for the emplacement of diamond-bearing kimberlites.

3.2 Tenement Geology

The northern portions of the tenements are underlain predominately by Cambro-Ordovician rocks of the Tomahawk beds which are composed of intercalated sandstone, limestone, and seams of glaucontic siltstone. The Tomahawk beds are overlain by younger Tertiary to Quaternary lateritic sands. To the south, younger sediments of Devonian age crop out and define the NW-SE trending Toko Syncline which marks one of the main depocentres of the Georgina Basin. The syncline comprises a succession of lower to middle Devonian carbonate and clastic sedimentary rocks.

4 PREVIOUS EXPLORATION

Previous exploration in the area has predominantly been related to the exploration for base metals, though some reconnaissance diamond exploration work has also been undertaken by CRAE in the late 1980's.

Reconnaissance stream sediment sampling by CRAE led to the recovery of numerous chromites and picro-ilmenite. Although several indicator mineral drainage anomalies were identified, no further work was completed to identify the source of the drainage anomalies.

5 EXPLORATION COMPLETED DURING REPORTING PERIOD

Exploration activities undertaken during the first year include:

1) Stream sediment sampling
2) Mineral chemistry analysis.

5.1 Stream Sediment Sampling

Stream sediment sampling (Figure 3) in the first year was aimed at confirming open file results, therefore, sample sites were chosen at drainage locations which reported positive for chromite and/or picro-ilmenite. Based on low grain counts from open file reports it was decided to take a minimum of 40kg of $^{-}$1.3mm material at each site. A summary of locations is presented in Appendix 1 and results are summarized in Appendix-2.

Field samples were processed at the Independent Diamond Laboratory in Perth. Material is screened at $^{-}$0.8mm and heavy mineral concentrate is routinely observed down to $^{+}$0.3mm size fraction. The $^{-}$0.3 to $^{+}$0.1mm fraction is sent for fusion for microdiamond recovery. The $^{-}$0.1mm slimes are discarded.

A total of two stream sediment samples were taken and only one reported positive for indicators. No diamonds were recovered from either sample.

5.2 Mineral Chemistry

All mineral grains of interests were analyzed using a Cameca WDS electron microprobe at the Australian National University. Analytical results are summarized in Appendix 3.

Analytical results of the chromites from sample TKWT002 show that three are metamorphic derived chromites, two are pseudobrookites, one is a highly altered picro-ilmenite, and the remaining represent a range of chromite compositions some of which are mantle-derived.

The metamorphic chromites (TK0WT02-A2 & A3) are characterized by exsolution lamellae of high-Al spinels (24 wt% Al_2O_3) and low-Al spinels (up to 6 wt% Al_2O_3), a feature typical of

low-temperature metamorphic chromites. These chromites classify as ferrian magnesian aluminous chromite (high-Al lamellae) and ferrian titanian and titanian chromite. None of these chromites are of interest with respect to diamond exploration follow-up.

Mantle-derived chromite are characterized as a single phase (no exsolution lamellae present) and a cokey rim, features typical of upper mantle chromites. Compositionally, the remaining chromites are relatively low in Cr_2O_3 (<50 wt%), with moderate to high Al_2O_3 values (11 - 50wt%) and moderate to high MgO (8-18 wt%). The low Cr and Al values indicate that they are unlikely originated from within the diamond stability field. However, more grains are required to better identify the possible source.

In addition to chromite a single picro-ilmenite was recovered. This grain has very high MgO values (9 wt%) and low but elevated Cr_2O_3 (0.22 wt%) values. Picro-ilmenite is a traditional indicator mineral to kimberlites and is also present in many other alkaline rock suites. The composition of the grain is well within the rather large compositional field defined by ilmenites derived from kimberlites worldwide.

Two pseudobrookite grains are also identified. The pseudobrookite solid solution series is the more Ti-rich mineral series of the Fe-Ti oxide suite of minerals. Compositionally the recovered grains classify as ferropseudobrookites but some solid solution of the Mg-endmember is evident by the presence of up to 4wt% MgO. Small amounts of Cr are also present.

The pseudobrookite solid solution series commonly forms in association with ilmenite and rutile. The breakdown or replacement of ilmenite by pseudobrookite (+/- rutile) is a result of oxidation of the ilmenite host grain. Although the pseudobrookite mineral series are not a traditional diamond indicator mineral, the intermediate Fe-Mg armalcolite phase is recognized in upper mantle metasomatized xenoliths recovered from kimberlites.

Taken together the compositions of upper mantle derived chromites, the picro-ilmenite and the Mg-pseudobrookites are all fairly similar supporting the possibility that they are a coherent suite of indicators derived from a similar or even the same host rock. When compared to similar minerals recovered from diamond-associated source rocks, they have moderate MgO, and relatively low but still slightly elevated Cr_2O_3 values. Although none of the TK00WT002 grains have compositions that indicate an origin from within the diamond stability field their compositions are more typical of other non-diamondiferous and more shallow-derived alkaline rock suites. A tentative working model is that the grains are sourced from a non-diamondiferous alkaline rock source possibly of kimberlite affinities. Additional grains and further sampling are clearly warranted to test this working hypothesis.

5.3 Rutile Dating Geochemistry

Rutiles recovered from two stream sediment samples were dated by the U/Pb method by Lazer ICPMS at the Australian National University using the 1440 Ma Mt Isa standard. The objective was to obtain a provenance direction of the detrital grains. Provenance directions are of particular interest to address possible source region of the crustal almandine garnets and other crustal metamorphic minerals which are recovered from routine sampling programs over the Georgina Basin. Results are attached in Appendix 4.

A total of four rutiles were dated yielding U/Pb ages between 385 Ma (+/- 3 Ma) to 475 Ma (+/- 3 Ma). The three younger dates are Devonian and the older date is a Larapinta Event age.

6 EXPLORATION PROGRAM AND BUDGET FOR NEXT REPORTING PERIOD

The Exploration Program for year two is expected to be as follows:

Program	Estimated Costs
Stream Sediment Sampling	$40,000
Heavy Mineral analysis of stream sediment samples	$25,000
Mineral chemical analysis of indicators	$5,000
Processing and anomaly targeting of the Eromanga survey	$15,000
Ground magnetic surveys	$25,000
Total:	**$110,000**

7 REHABILITATION

As no substantial disturbance activity was undertaken during the year there has been no rehabilitation programs done.

8 REFERENCES

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