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ELKEDRA DIAMONDS NL

Altjawarra Craton Diamond Project
Mount Ultim Target Area

Annual Report for period ending April 30, 2001
For EL's:
22528 (Mount Ultim)
22537 (Dulcie)

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Map Sheets:
1: 250,000: Huckitta (SF53-11)
1:100,000: MacDonald Downs (5953); Arapunga (6053)

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1 INTRODUCTION

Exploration Licenses (EL's) 22538 and 22537 are located on the Huckitta (SF53-11) 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)
22538	Mount Ultim	May 24, 2001	415	1,294
22537	Dulcie	July 16, 2001	484	1,527

Interpretation of Landsat 7 satellite imagery by Dr. Nick Lockett of Nick Lockett and Associates is shown in Figure 2. Physiography ranges from an elevated, dissected, plateau along the southern portion of the EL's, which corresponds with the Ashburton Surface with elevations ranging from 500 to 600m above sea level. This relief gives way to relatively flat and expansive sand plains to the north and northeast. 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 these two tenements up to April 30, 2002 by Elkedra Diamonds NL.

2 CONCLUSION

The recovery of indicator minerals and a single microdiamond from the Mount Ultim target area confirms CRAE open files results and highlights the diamond prospectivity of the region. Potential sources include primary kimberlite or related rocks, or sediments of the South Georgina Basin. The distribution of known indicators does not support a secondary source at this stage.

Continued exploration in the area is warranted to identify possible primary source rocks of the indicators and diamonds. Planned activities include drill testing of identified aeromagnetic and ground magnetic targets and more detail stream sediment sampling both in known anomalous areas and regionally.

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 Dulcie 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 as well as three microdiamonds on the Dulcie tenement and one macrodiamond on the Mount Ultim tenement. Although several indicator mineral drainage anomalies were identified, no further work was completed to identify the source of the drainage anomalies. The location of the chromite and diamond positive sites identified from the open file report data was used as a starting point for initial sampling by Elkedra.

Previous exploration for base metals has almost exclusively been centered around the Box Hole/Turkey Creek Pb-Zn occurrence which was initially discovered in the 1960's. Extensive work was undertaken by various companies the 1970's and more recently by CRAE in the 1990's who extended their exploration activity some 28 kms NE and 45 kms SE of Box Hole. No additional base metal discoveries have been identified to date.

5 EXPLORATION COMPLETED DURING REPORTING PERIOD

Exploration activities undertaken during the first year include:

1) Stream sediment sampling
2) Selected loam sampling
3) Anomaly targeting off the Elkedra aeromagnetic survey
4) Ground magnetic survey
5) Photo-interpretation study
6) Mineral chemistry analysis
7) Mineral isotope analysis

5.1 Stream Sediment Sampling

Stream sediment sampling 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 diamond. 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.

Field samples were initially processed at the Independent Diamond Laboratory in Perth and are now routinely processed at the Diatech 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.

Many of the concentrates are dominated by almandine garnet such that routine processing techniques are insufficient to reduce concentrates to an observable amount. Detail research by Diatech has now resolved this concentrate problem though delays in processing of samples occur.

The exact source of the almandine garnet is not clear, but what is clear is that they are crustal in origin and not related to kimberlite activity. Possible sources include the Harts Ranges to the south with transport to the Mount Ultim area by a paleodrainage network. Some of the garnet may also shed from conglomerate seams in the Dulcie sandstone. The abundant garnet is more of a processing problem than a diamond exploration tool.

A total of fourteen stream sediment samples were taken during the report period. All locations are shown on Figure 3 and tabulated in Appendix 1. A summary of results is attached in Appendix 2. Of all samples taken to date, 11 reported positive for chromite and confirm open file data results. The higher grain count recoveries by Elkedra indicate that the sampling procedures in place are adequate.

Results define three drainage anomalies, two of which are close to the headwaters of the drainages indicating a nearby source. The western Arapunya anomaly (MD01WT001) is located ~2.5km from the Mount Ultim plateau and the eastern Ooratippra drainage anomaly (AR01WT001-004) is located in an area which previously reported for chromite and microdiamonds. The two anomalies and the Ooratippra anomaly in particular, represent encouraging indicator mineral targets. Both anomalies require more detail follow-up sampling and ground studies.

A third anomalous sample (MD00WT001) is identified in the western margin of the target area and is referred to as "Mount Ultim West." These chromites are all located ~12km downstream from a moderate priority aeromagnetic anomaly (CWN-025) and a previously reported macrodiamond. Other positive sample sites include downstream from both the Ooratippra and Arapunya drainage anomalies.

5.2 Loam Sampling

Loam and/or termite mound sampling was undertaken over the center of selected aeromagnetic targets. A total of four loam/termite samples were taken. Sample locations are shown on Figure 3, listed in Appendix 1 and a summary of results is attached in Appendix 2.

Results of heavy mineral concentrate separation are available for all samples with only one sample reporting positive results. A single microdiamond was recovered from sample AR01WT007 which is a 40kg combined termite and loam sample taken over aeromagnetic anomaly CWN-017. An SEM image of the microdiamond recovered is attached in Appendix 3. The recovery of a microdiamond from a termite mound sample over CWN-017 is considered significant. The anomaly will be drill-tested next reporting period.

5.3 Magnetics

The release of the Elkedra aeromagnetic survey flown by Tesla Airborne for the NTGS has proved critical in this early stage of exploration and forms the basis of all geophysical work undertaken to date.

5.3.1 Aeromagnetics

All aeromagnetic interpretation and processing was undertaken by Dr. Duncan Cowan of Cowan Geodata Services, Perth.

The aeromagnetic, altimetric dtm and radiometric data covering the Mt Ultim project area were windowed out of the Elkedra NTGS dataset. The windowed area was initially analyzed by running the "Smart" filter program of Cowan Geodata Services. The filter is a simple pattern recognition technique developed by Cowan Geodata Services. The program uses regression analysis between a window of the grid data and a typical model anomaly to identify roughly circular anomalies. The model data calculated is a full 3D vertical cylinder implementation. The method involves various inputs to the program including window size, model cylinder radius, top and bottom depths and amplitude response. In the Mount Ultim area the filter was run once to test response using a standard 200m diameter cylindrical model with a 30m depth, 400m grid window, and 25-200nT amplitude range. This method recognized twenty nine anomalies in the area.

Further data enhancement and preliminary kimberlite target screening was later undertaken using a combination of techniques which included:

- 1D Wavenumber filtering
- 2D Euler deconvolution depth calculation
- 2D Werner deconvolution depth calculation
- Modelling and inversion of individual anomalies

The focus was on identifying possible kimberlite targets in the presence of significant intrasedimentary background noise due to maghemite channels, areas of ferricrete, clay-pans and sinkholes and cultural sources. The altimetric dtm and radiometric data were used to assist in anomaly screening. Identifying possible kimberlite magnetic anomalies in an area of extensive drainage and palaeosurface related magnetic anomalies is difficult due to a high degree of anomaly overlap as well as interference from anomalies due to shallow basement rocks. The relatively wide line spacing of 400-m limits spatial resolution of small sources as small kimberlites located between flight lines may not be detectable or produce only weak magnetic anomalies with magnetic attributes similar to sinkholes etc. After final processing a total of twenty six anomalies were ultimately identified (Figure 3; Appendix 4) with one given high priority, eight moderate and seventeen low priority.

Field follow-up of several of these anomalies showed that several of the preliminary targets that modeled as small thin-sheets proved to be cultural. Some of the priority anomalies had coincident geomorphic features and these became higher priority anomalies.

Ground magnetic surveys over all high and moderate priority targets is planned with further target screening to be reviewed after ground truthing.

5.3.2 Ground Magnetics

One ground magnetic survey was undertaken over aeromagnetic anomaly CWN – 017 during the reporting period (Appendix-5). The ground magnetic survey was done using a GEM System GSM-19W V6 Magnetometer equipped with a GPS for collection of data in real-time walk-mag mode. The digital data is dumped into Toshiba notebook computers in the field and is processed and grided using the windows version of Chris.dbf. Digital data is also e-mailed via satellite connection facilities to the company's consultant geophysicist, Dr. Duncan Cowan of Cowan Geodata Services for further processing and review.

A 600 X 550 meter grid (Appendix 5) was centered over the original coordinates determined from the moderate priority aeromagnetic anomaly at 568410E; 7546677N (MGA 94). A total of 7.2 line-km's was surveyed with a line spacing of 50m. This anomaly is of importance because a micro-diamond was recovered over the surface from a single loam sample. The microdiamond recovery upgraded the anomaly from a moderate to high priority target.

Comments by consultant Dr. Duncan Cowan on this anomaly are as follows: "MAGMOD3 inversion of the aeromagnetic data suggests a tabular body dipping south at 32°. It is a small discrete anomaly in the ground magnetometer data and results suggest a narrow source elongate east west. The anomaly is seen on 4 profiles. There is a suggestion that the anomaly may be related to the smaller anomalies to the east. Despite reservations about the target anomaly having some of the characteristics of a palaeochannel or claypan, follow-up drilling is recommended to determine the anomaly source."

The anomaly will be drill-tested in the next reporting year.

5.4 Photo-Interpretation Geology

Dr. Nick Lockett of Nick Lockett & Associates undertook a photo and Landsat-7 interpretation at a scale of 1:50,000 of a large portion of the Mount Ultim project area. A copy of the map is attached in Appendix 6.

A total of thirty five photo feature anomalies are identified (Figure 3; Appendix 7). Most of the anomalies are given a low priority rating, though three are given a medium priority rating. One of the photo-feature anomalies, LOC-004, has a coincident low amplitude (3nT) magnetic anomaly associated with it.

Photo-feature LOC-002 was field checked and sampled. The field team describe this anomaly as follows: "It is an enclosed, oval, claypan about 100m in diameter bounded by cliffs of Dulcie sandstone on its south west side, by a rock pillar to the south east and by a low tilted sandstone and silicified sandstone ridge on the other sides. There is no present-day drainage from the anomaly. A view of the anomaly surface from the pillar reveals distinctive intersecting joint sets which are traceable to the walls of the cliff. This feature suggests the anomaly is underlain by undisturbed Dulcie sandstone and therefore is unlikely to be a kimberlite pipe because joint sets of the Dulcie sandstone would be disrupted by any kimberlite or pipe-like intrusion."

"A small shallow (0.5 m deep) pit was dug into bedrock in the center of the anomaly. The material consists of green-grey, sandy clay with limonite staining which overlays fractured, white friable sandstone. Clay penetrated cracks in the sandstone. The sandstone is of the same erosion-susceptible type that may represent paleao-claypan features in the Dulcie sandstone.

Although anomalies of this kind are unlikely to be expressions of kimberlite intrusions a single loam sample was taken."

No indicators or diamonds were reported from samples taken over this anomaly and at this stage, the anomaly does not warrant further work. Other photo features will be field checked in the following reporting period.

6 MINERAL CHEMISTRY

All geochemical analytical work was carried out by Dr. Wayne Taylor at the Australian National University, Canberra.

6.1 Indicator 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 8.

Indicator mineral chemistry characterize the chromites as anomalous and indicates that they are not sourced from regional crustal rocks and are derived from deeper upper mantle source rocks. A particular feature of the Mount Ultim chromites as a whole are the high TiO_2 values reported with up to 4 wt% TiO_2 identified. High titanium chromites are unusual and are commonly associated with lamproite or other related alkaline rock source rocks.

Of particular interest is the recovery of high-Cr chromites with up to 57 wt% Cr_2O_3 from the Mount Ultim West sample. Associated low TiO_2 and Al_2O_3 values are compatible with chromites recovered from diamonds worldwide. The recovery of these high-Cr chromites downstream from a previously reported macrodiamond is extremely encouraging.

6.2 Rutile Dating Geochemistry

Rutiles recovered from two stream sediment samples along the Bundey River (MD00WT001 and MD00WT002) and two rock samples (one sample from a glauconitic sandstone of the Tomahawk beds (MD01WR001) and the other from the Dulcie sandstone (AR01WR001)) 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 maximum age of the sedimentary rocks, and 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 9.

Dating of the detrital grains yields U/Pb ages ranging between 332 Ma (+/- 2 Ma) and 1683 Ma (+/- 26 Ma). The younger 332 Ma to 365 Ma grains yield an Alice Springs Orogeny age (~360 – 370 Ma) indicating a source from the south for detrital material in this area.

The Tomahawk beds represent the highest stratigraphic unit of the Cambro-Ordovician exposed at Mount Ultim. A total of thirteen rutiles were dated from this sample with U/Pb ages ranging from 514 Ma (+/- 3 Ma) to 895 Ma (+/- 7 Ma). The 514 Ma date gives a maximan age of the rock as early Cambrian. Most of the rutiles are mainly neoproterozoic in age reflecting the age of the predominant basement rock source for the sedimentary rock.

Seven rutiles from a friable white sandstone unit of the Dulcie Sandstone yielded U/Pb ages ranging from 361 Ma (+/- 4 Ma) to 2209 Ma (+/- 27 Ma). The results indicate a maximum age of Carboniferous/Devonian for the sandstone.

Overall the results indicate that the source regions of the two sediments were quite different with the younger Dulcie sandstone sourcing material from older proterozoic basement rocks that were not available as source material for the Tomahawk beds. From a diamond exploration viewpoint these results also indicate that it is conceivable that there could be a detrital source of chromites derived from Proterozoic basement. Further work is required to establish whether the sediments do represent a secondary source of chromites.

7 EXPLORATION PROGRAM AND BUDGET FOR NEXT REPORTING PERIOD

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

Program	Estimated Costs
Drilling of selected magnetic targets	$50,000
Geochemistry of drill spoils	$5,000
Stream sediment sampling	$40,000
Heavy Mineral analysis of drill spoils	$20,000
Heavy Mineral analysis of stream sediment samples	$60,000
Mineral chemical analysis of indicators	$5,000
Total:	**$180,000**

8 REHABILITATION

As no substantial disturbance activity was undertaken during the year no rehabilitation programs were done.

9 REFERENCES

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