ANNUAL REPORT TO
THE DEPARTMENT OF MINES & ENERGY
NORTHERN TERRITORY

MOUNT YOUNG 1:250 000
EXPLORATION LICENCE
EL 8768

REPORTING PERIOD
17/07/96 - 16/07/97

CARNEGIE MINERALS NL
ACN 009 237 736

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Key: Mount Young 1:250,000 Sheet, airborne magnetic/radiometric survey, loam sampling, geochemistry, diamonds, indicator minerals.

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EXPLORATION WORK SUMMARY

1995-1996

Carnegie Minerals NL during the first year began to carry out exploration to evaluate placer and primary diamond potential over the tenement area, following discoveries of diamondiferous kimberlite by the ADEX Joint Venture at the Merlin field and other diamond projects inland of Carnegie’s Batten Group of tenements.

The first year exploration programme included a review of NTGS Open files and published geological data as well as preliminary interpretation of the standard b/w 1:85,000 aerial photographs.

The Company contracted World Geoscience Corporation Limited to carry out a 400 m line spacing airborne magnetic/radiometric survey involving approximately 790 line kilometres over EL 8768 in conjunction with other tenements belonging to Carnegie, and to process the acquired data.

CRA Exploration Pty Ltd (“CRAE”) in 1995 entered into arrangement with Carnegie whereby CRAE carried out processing and digital enhancement of geophysical data which was completed by April 1996.

A reconnaissance field visit in November 1995 and helicopter sample programme over the tenement area in May 1996 were carried out as a follow-up to airborne data and geological assessment based on that data interpretation (3x20 kg samples). The samples were geochemically tested and observed for minerals.

1996-1997

Carnegie carried out evaluation of the obtained geophysical data using independent geophysical consultant services.

Based on the geophysical evaluation results and in line with the current market and political situation, the EL 8768 area has been substantially reduced.
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1. **INTRODUCTION**

EL 8768 contains 22 graticular blocks (80 blocks before the reduction of the tenement area) approximating to 70 km\(^2\). The tenement was granted by the Minister for Mines and Energy on 17 July 1995 to Carnegie Minerals NL ("Carnegie"). Approximately 15 kilometres NE of Borroloola, the tenement lies within the Mount Young 1:250,000 map sheet and represents a part of Carnegie’s Batten Group of tenements (Figure 1).

EL 8768 is included into the group of tenements principally pegged to explore for placer and primary diamonds after previous work by Ashton Mining Limited - ADEX Joint Venture ("ADEX") which identified eleven diamond-bearing pipes in the Merlin and Coanjula projects inland of Carnegie’s Batten tenement group. In addition the McArthur River HYC base metal mine occurs sixty kilometres south west of the company’s Group of tenements, thus the potential for base metal mineralisation was also taken into consideration.

In September 1995 CRA Exploration Pty Limited ("CRAE") entered into an agreement with Carnegie Minerals NL regarding the funding for the processing and the interpretation of the results of an airborne magnetic/radiometric survey data flown in December 1995 and funded by Carnegie over its Batten tenement Group.

2. **PREVIOUS EXPLORATION**

Carnegie’s EL 8768 and 8769 cover ground previously pegged by BHP Minerals Pty Ltd ("BHP") EL 7892. The whole area of BHP’s EL 7892 was surrendered in February 1995 (NTGS Open files CR 94/491 and CR 95/504). BHP explored for sediment hosted base-metal mineralisation. In the 1980’s BHP flew an airborne magnetic/radiometric survey which covered the western part of EL 7892 mostly outside the present Carnegie’s tenements. A follow-up PROTEM electromagnetic programme over this area in 1994 failed to identify any exploration targets.

3. **GEOLOGICAL**

Carnegie’s Batten Group of Tenements occupies a portion of the Middle Proterozoic McArthur Basin (Haines et.al., 1993).

The McArthur Basin contains a thick and diverse succession of Paleo- to Mesoproterozoic sedimentary and minor volcanic rocks subdivided into four groups. These rocks in turn, are covered by relatively thin and flat lying terrestrial and marine rocks of Early Cretaceous age.
Outcrops of Proterozoic and Cretaceous rocks are limited within the tenement Group’s area with the major geological boundaries inferred from regional geological and geophysical interpretations.

EL 8768 consists of rocks belonging to the Proterozoic Tawallah and McArthur Groups which include conglomerates, sandstone, mudstone, shale and minor evaporites and volcanics.

It is inferred that Early Cretaceous mudstone and sandstone overly Proterozoic rocks within the tenement area.

According to geomorphic classification, the major part of the Group’s area is represented by tidal silty and sandy flats, and almost flat coastal marine terrace covered with a thin veneer of Cainozoic mainly unconsolidated sandy, silty deposits with minor evaporates and alluvial gravel, sand and clay deposits within river valleys. Further inland, there are gentle erosional slopes on the coastward side of the escarpments, low hills and ridges made up by Proterozoic sandstone.

4. WORK PROGRAMME - CARNEGIE MINERALS 1995-1997

The work engaged the services of various consultants to carry out field work and subsequent processing of samples. This work was carried out in varying stages.

1995-1996

1. Review of NTGS Open files and general published geological data.

2. Purchase and preliminary interpretation of the standard b/w 1:85,000 aerial photographs for the tenement area.

3. World Geoscience Corporation Limited was contracted to carry out a 400 m line spaced magnetic/radiometric survey over Carnegie’s Batten Group of tenements (approximately 790 line kilometres within EL 8768).

4. The airborne magnetic/radiometric survey data were processed by World Geoscience Corporation Limited and CRA Exploration Pty Ltd, using a number of image filter methods.

5. Discussions with Aboriginal Affairs Planning Authority requesting access certification.
6. Reconnaissance field visits and helicopter sample programme over the tenement area (3x20 kg samples). The samples were mineralogically observed after processing by Diamond Metallurgical Services, Perth. Processing involved screening, Pleitz jiggling, TBE separation.

7. Laboratory testing for multi-elements on -400 micron sized samples by Genalysis Laboratories, Perth.

1996-1997

1. Carnegie carried out interpretation of the obtained geophysical data using independent geophysical consultant services.

2. General evaluation of the tenement potential based on the results of sampling and the geophysical interpretation as well as on the current market and political situation.

5. RESULTS OF CARNEGIE WORK PROGRAMME

Based on the desk-top study 3x20 kg deflation surface samples of -2mm screen size were processed in Perth by Diamond Metallurgical Services. Results of mineralogical analysis are negative. Refer to Figure 2 for samples location.

Geochemistry of soil samples did not highlight any major geochemical anomaly.

The helicopter programme over the tenement also involved closer inspection of localised geology.

The World Geoscience interpretation of the data of the magnetic/radiometric survey outlined a number of dipolar and sinuous anomalies.

Geophysical Airborne Magnetic/Radiometric Survey Specifications

Contractor  World Geoscience Corporation Limited
Magnetometer  VH-FGS Rockwell Aerocommander Shrike 500S
Sensor  Split Beam Cesium Scintrex VIW2321/CS2
Resolution  0.001 nT
Cycle rate 0.1 seconds  
Sampling interval 7 metres  

Spectrometer  
256 channel PGAM 1000  
Volume 33.56 litres  
Cycle rate 1.0 second  
Sample interval 70 metres  

Data Acquisition  
1 Chart recorder  
Picodas PDAS 1000 acquisition system  

Flight Specifications  
Flight line spacing 400m  
Direction 000-180° AMG  
Tie line 4000m  
Tie line direction 090-270° AMG  
Mean terrain clearance 60m  
Navigation Differential GPS satellite positioning  

Geochemical Sampling  
Genalysis Laboratory Services Pty Ltd  
Suite analysed B/ETA: Au  
(variable) B/AAS - Ag, Cu, Pb, Zn  
A/OES - Ni, Cr, Ti  
A/MS - MS - Ba, Ce, Nb, Sr, Zr, Nd, U  

Stream-Loam Sampling  
2x20 kg sediment samples of -2mm material were collected as soil samples over features or drainages. A portion of -0.4mm material was retained for geochemical processing.  

Samples were processed at Diamond Metallurgical Services for diamonds and mineral indicators. Their results were negative.
**Airborne Magnetics/Radiometrics**

Details of the contoured magnetics and digitised radiometrics are provided as an appendix. World Geoscience Corporation was contracted to process the raw data into ER Mapper format. Raw data images were raster processed using a simulated light source to illuminate the data set from a selected elevation and azimuth and also an Automatic Gain Control (AGC) Enhancement to amplify low and suppress high amplitudes - to enable the detection of extremely subtle features in the data. Vertical derivatives of the magnetic field were also used to enhance subtle features.

Further geophysical interpretation of the data in 1997 by an independent geophysical consultant has revealed some areas with magnetic/radiometric signatures which warrant follow-up exploration and have been retained.

6. **CONCLUSIONS**

EL 8768 occupies a northerly extension of the McArthur River. Magnetics has outlined a varying geology which shows two distinct magnetic groupings: 1) a low magnetic background of basinal sediments and 2) a higher amplitude magnetic set possibly representing Proterozoic basement. This can be interpreted to represent a relatively shallow basement cover out to sea overlapped by sands and colluvium.

Two isolated dipolar features at approximately 658000E/8237500N and 659000E/8243000N were followed up by field inspection. Results of soil samples were negative, requiring further in-depth examination using a drill rig.

During the second year, exploration on the ground was limited to one field trip and resolution of airborne magnetic data.

A decision to reduce the size of EL 8768 was made to concentrate on drilling unresolved magnetic anomalies. A surrender of portions of EL 8768 was made in July 1997.

7. **EXPENDITURE**

Exploration over the year was reduced owing to a) inclement weather (seasonal "wet") and b) awaiting logistical assessment to implement drilling holes coinciding with regional plan involving a number of ELs.
Geophysical Interpretation 14,500
Consultants/Staff 3,180
Maps/Photos 696
Travel/Accommodation 477
Field Consumables 415
External Affairs 3,640
Administration/Overheads 5,800
$28,708

7. **FUTURE WORK PROGRAMME AND COST ESTIMATE**

Based on the 1995-1997 two years exploration some of unresolved geophysical targets on the retained area need to be further assessed. Interpretation of geophysical data will lead to 4WD vehicle and wherever necessary helicopter assisted lag, soil and drainage sampling, followed up by terrain drilling programmes operating with the Company’s mobile RC/Auger drilling rig.

**Proposed Year Three Programme**

- Continuation of geophysical data interpretation on the ground.
- Drilling of outlined retained magnetic targets.
- Await Aboriginal Affairs Planning Authority clearances before implementing a comprehensive follow up sampling programme to test geological targets using appropriate combinations of lag, soil and drainage sampling and where warranted open hole auger/reverse circulation drilling.

**Proposed Year Three Expenditure**

- Aboriginal clearance $8,000
- Follow up ground surveys $7,000
- Loam, lag, drainage sampling
- Laboratory Analysis $8,000
- RC/auger drilling contingency $10,000
  $33,000
9. REFERENCES

