Title: FINAL REPORT FOR EXPLORATION LICENCE 7523, SARGENTS AREA, BATCHelor NORTHERN TERRITORY 31.03.92 TO 27.05.99

Project Name: SARGENTS

Map Sheets: PINE CREEK SD 52-8 1:250,000

Commodities: GOLD, BASE METALS

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Report No. 23976

Final Report EL7523
TABLE OF CONTENTS

SUMMARY

1. CONCLUSIONS AND RECOMMENDATIONS
2. INTRODUCTION
3. LOCATION AND ACCESS
4. TENURE
5. PREVIOUS EXPLORATION
6. REGIONAL GEOLOGY
7. LOCAL GEOLOGY
8. WORK CARRIED OUT DURING THE REPORT PERIOD
9. ENVIRONMENTAL/REHABILITATION REPORT
10. REFERENCES

BIBLIOGRAPHIC DATA SHEET

LIST OF FIGURES

Figure 1 EL 7523 Location Map.................................1:1,000,000
Report No: 23976

Title: FINAL REPORT FOR
EXPLORATION LICENCE 7523
SARGENTS AREA BATCHelor,
NORTHERN TERRITORY
04.09.89 TO 03.06.99

Author: K.A. Williams

Date: 11 June, 1999

LOCATION MAP

SUMMARY

A considerable amount of exploration was carried out prior to Nicron Resources obtaining the ground. The work was targeted at uranium and base metals. Exploration by Nicron Resources was targeted at gold and included geological mapping; rock chip and steam sediment sampling; base of slope BLEG sampling; RAB, RC and diamond drilling.

A gold resource has been identified at Sargents and followup assays were encouraging. However, with the depleting reserves at Woodcutters Mine the focus of exploration moved away from gold and back to base metals.

With the closure of Woodcutters Mine all exploration tenements are being disposed of, including the Sargents and Sargents North prospects which remain prospective for gold.

Final Report EL 7523
1. CONCLUSIONS AND RECOMMENDATIONS

1.1 The controls and style of gold mineralisation located at the prospects are still not well understood, but they show a number of similarities with unconformity related uranium-gold-PGM style mineralisation, eg Coronation Hill.

1.2 The genesis of the haematitic breccias in the early Proterozoic succession beneath the Tolmer Group sandstones is uncertain, but it is either a flat laying thrust fault zone or a west dipping fault.

1.3 A comprehensive interpretation of the geology and structure utilising the large geochemical, geological and geophysical database is required before planning any follow-up exploration.

1.4 The source of the magnetic high is a magnetite rich pod within metamorphosed dolerite or gabbro.

1.5 The bleached brecciated sediments intersected in SARD6 are not mineralised.

2. INTRODUCTION

The licence was held by Aztec Mining Company Limited/Normandy Woodcutters Limited and was taken out to explore the area for structurally controlled base metal (Woodcutters type) and unconformity related uranium-gold-PGM mineralisation.

The Sargents project encompassed 3 exploration licences which included 7523, 7706 and 8929.

The aim of this final report is to summarise the work conducted during the term of tenure for EL7523.

3. LOCATION AND ACCESS

Exploration Licence 7523 (Sargents is located 15kms south-southwest of Batchelor on the Batchelor 1:100,000 (5171) mapsheet. Access is gained via Camp Creek Road from the Adelaide River or south along the old railway line from Batchelor (Figure 1).

4. TENURE

Exploration Licence 7523 was granted to Aztec Mining Company Limited on 31st March 1992 for a period of six years. The licence comprised 25 graticular blocks and was subsequently been reduced from 25 to 7 graticular blocks.
5. **PREVIOUS EXPLORATION**

During 1952, the BMR conducted an airborne radiometric survey of the district (Wood and McCarthy, 1952) and identified the Waterhouse No.2 radiometric anomaly which is located immediately to the north east of EL 7706.

In 1965, the BMR carried out a reconnaissance geological, geochemical and geophysical survey over the area now covered by EL 7706 (Shatwell and Duckworth, 1966). Auger holes were spaced 122m (400 feet) apart along east-west traverses spaced at 732m (2400 feet) intervals. Bottom hole, 'C' horizon samples were collected and assayed for Cu, Pb, Ni, Co, U and P, and holes were radiometrically probed. Electromagnetic and radiometric surveys were also conducted along the regional traverses.

Modern ground exploration of the area commenced in 1970 when the BMR conducted a combined reconnaissance geological, geochemical and radiometric survey in the vicinity of Stapleton. Auger holes were drilled to the "C" horizon on a grid with holes spaced 61 metres (200 feet) apart along traverses at 366 metres (1200 feet) intervals. All samples were assayed for Cu, Pb, Zn and Ni. Maximum values obtained on the current EL 7523 were 870 ppm Ni, 1100 ppm Pb, 310 ppm Zn and 320 ppm Cu. The high Pb value is an isolated occurrence and probably does not represent a significant anomaly. More cohesive Ni anomalies are however evident in the data. Elevated Ni values occur over the Beestons Formation and Celia Dolomite, and also appear to be related to the Middle Proterozoic Tolmer Group/Lower Proterozoic unconformity.

In 1974, the BMR also drilled a 6.4 m stratigraphic hole (RJ 72, Enclosure 1), on EL 7706 as part of a regional stratigraphic drilling program (Johnson et al 1979). A hard, pink, fine to medium grained quartzite was cored from 6.1 to 6.4m.

Private company exploration of the area commenced in 1971 following the Commonwealth Government release of land from the Rum Jungle Reserve area. Queensland Mines Ltd was granted AP2501 which included the majority of the current EL 7523. Exploration was mainly for uranium and included airborne radiometrics, follow-up reconnaissance ground radiometrics and auger drilling along the inferred Coomalie Dolomite/Whites Formation contact. Some reconnaissance panning for gold and testing for heavy metals by a field geochemistry kit were also undertaken. Three main uranium prospects were identified and followed up however they were all located outside the current licence.

In the early 1970's CRA Exploration Pty Ltd held EL 610 which covered a large area east of the Waterhouse Complex including the eastern side of EL 7523. A regional stream sediment survey was carried out, with samples assayed for U, Pb, Zn, Cu and Ni. Anomalous Ni (37 ppm) was recorded from a stream located near the railway line northwest of "Sargents". Follow-up work concentrated on the Waterhouse uranium and base metal anomalies, which are located to the north of EL 7706.

Uranerz Australia Pty Ltd acquired numerous exploration licences in the region between 1977 and the early 1980's including EL's 3194 and 4378 which were located in the western portion of EL 7523. The exploration target was vein-type uranium and base metal deposits associated with the Coomalie Dolomite/Whites
Formation contact. Work included airborne and ground magnetics and radiometrics, gridding, geological mapping and electromagnetic surveys. Most work was carried out south of EL 7523 where a number of uranium and base metal prospects were delineated.

At the same time as the Uranerz exploration, Marathon Petroleum Australia Limited were actively exploring the region to the east of the Waterhouse Complex in a joint venture with International Mining Corporation NL ([MC]). El's 1219 and 2726 were located on the eastern portion of EL 7523. JMC commissioned an airborne magnetic and radiometric survey in 1978. Marathon Petroleum initially conducted interpretation of the airborne data, photo-interpretation, ground radiometric and radon reconnaissance and orientation studies over Rum Jungle Creek South and Waterhouse No. 2. The airborne geophysical anomalies were follow up by ground magnetics, spectrometer surveys and geological mapping. Track-Etch radon surveys were also widely utilised.

Shallow rotary/percussion drilling was carried out in four separate areas on the current EL 7523 all of which were located along the interpreted Coomalie Dolomite/Whites Formation contact zone (shallow <25m) (see Enclosure 1). Low to medium grade uranium mineralisation was found to occur associated with cross faulting or shearing on graphitic shales and chlorite/amphibolite schists in the Whites Formation, at or above the Coomalie Dolomite contact. Drill hole samples were analysed for U, Cu, Pb, Zn, Co, Ba, Au and Th. Slightly anomalous base metals were reported, and anomalous Au (100 ppb) was recorded at the Depot Creek Sandstone/Whites Formation contact, in a hole (1 3B) located to the northwest of "Sargents".

Mobil Energy Minerals Australia Incorporated acquired EL's 3526 and 2560 in 1 982. Both licences covered ground previously held by Marathon east of the Waterhouse Complex. Uranium was the main target, particularly in the Coomalie Dolomite and Whites Formation. Areas of interest were chosen from previous work by Marathon ground magnetic, scintillometer, gravity and electromagnetic traverses were made, followed by limited RAB drilling on EL 3560.

Bottom hole samples from the RAB holes were analysed for Cu, Pb, Zn, Co, Ni, Cr, Th and U and all holes were radiometrically logged. Maximum values of 190 ppm Cu, 150 ppm Pb and 155 ppm Zn were obtained. A coincident gravity, EM and magnetic anomaly was tested with a short diamond drill hole (95.3m) which intersected magnetite quartzite at depth. Half core samples were analysed for Cu, Pb, Zn, Ni, U, Au and Pt with no significant results.

Idemitsu Minerals Aust Pty Ltd held EL 4772 in the mid 1980's which included the current licence areas, however, all work was conducted on the adjoining Waterhouse Complex (Varkey, 1987 and Yokoyama, 1988).

Northern Gold held EL 5870 which included the present area of EL 7706. Regional BLEG (Bulk Leach Extractable Gold) soil sampling and rock chipping were conducted within the relinquished area. Isolated spot highs up to 35ppb Au max were recorded for the soil sampling over plateau areas interpreted as Middle Proterozoic sandstone.
6. **REGIONAL GEOLOGY**

The Archean Waterhouse Complex underlies a major part of EL 7523. Lithologies of the Waterhouse Complex comprise granite, banded iron formation, schists and gneisses.

On the eastern side of the Waterhouse Complex, quartzite and conglomerate of the Lower Proterozoic Beestons Formation unconformably overlie the basement. Massive crystalline dolomite of the Celia Dolomite overlies the Beestons Formation.

Coarse clastics of the Crater Formation are more widespread and completely surround the Waterhouse Complex. They are overlain by carbonate of the Coomalie Dolomite.

The conformable contact between the carbonaceous dolomitic mudstones of the Whites Formation and the Coomalie Dolomite has been the main focus of exploration in the district as many base metal and uranium prospects occur in the vicinity of this stratigraphic horizon.

The remainder of the Lower Proterozoic stratigraphic sequence comprising the Wildman Siltstone, Koolpin Formation, Gerowie Tuff, Mount Bonnie Formation and the Burrell Creek Formation occurs on the eastern side of the exploration licences.

Unconformably overlying the Lower Proterozoic sediments, particularly the Coomalie Dolomite are the Middle Proterozoic Depot Creek Sandstone Member and the Buckshee Breccia, formerly referred to as HQB. Outliers of Middle Proterozoic Depot Creek Sandstone overly both the Coomalie Dolomite and the Breccia.

Outcrop is generally poor in the north which is mainly covered by surficial Cainozoic laterites and alluvium.

A major fault is interpreted to pass through the central eastern side of the area. Displacement across this fault which trends northeast-southwest in the licence area is east block down.

7. **LOCAL GEOLOGY**

The principle styles of mineralisation occurring in the region comprise Rum Jungle type, unconformity related uranium deposits (e.g. Kylie) and many lesser occurrences (Waterhouse, etc.). Base metal mineralisation of the Rum Jungle type is also present, comprising stratiform copper with associated nickel-cobalt in Whites Formation lithologies, i.e. black shale with some dolomitic component. The latter has been discovered at South East Kylie. Cupriferous black shales were also noted at Waterhouse No.2. Showings of this style of mineralisation are widespread in the region.

The Middle Proterozoic unconformity on the eastern flank of the Waterhouse Complex is prospective for gold and PGE mineralisation as evidenced by the discoveries at Sargents and Sargents North.
The structural geology of the Sargents area was revised, particularly with regard to the significance of widespread brecciation of the early Proterozoic. The breccias were best explained as indicating a major, post-middle Proterozoic relatively flat laying, east dipping, fault/breccia thrust zone several hundred metres thick.

8. **WORK CARRIED OUT DURING REPORTING PERIOD**

8.1 **Year One**
- 63 BLEG samples with a maximum value of 4.42 ppb Au.
- 10 rock chip samples recorded no significant results.
- 64 –40 mesh stream samples. All except one (Sample 581066, 67.5 ppb Au) recorded less than 0.002 ppm Au.
- 19 RAB holes drilled as part of the regional exploration programme for magnesite proved that the carbonate was dolomite and no further work was carried out.
Detailed results can be found in Ormsby, 1993 (CR 24325)

8.2 **Year Two**
- Stream sediment sampling to follow up a BLEG anomaly. 39 samples of 5kgs of –2mm active stream sediment produced highly anomalous results (36.0 ppb Au max)
- 284 –425 soil samples were taken to test the BLEG anomaly and a significant gold anomaly area of 130m x 50m with >1.0 g/t Au was outlined.
- In the high soil anomaly are 20 rock chip samples recorded a maximum value of 0.73 ppm Au.
- 3 costeans were excavated to test the high Au soil anomaly. 263 channel samples were collected. Significant results include:
  - C1 5m @ 2.85 g/t Au and 2m @ 4.34 g/t Au
  - C2 21m @ 2.26 g/t Au
  - C3 7m @ 2.03 g/t Au and 3m @ 1.08 g/t Au
- 11 RC holes were drilled to test the soil and costeaning anomalies. Highlights of the drilling were:
  - SARC 3 26m @ 1.85 g/t Au
  - SARC 4 4m @ 0.85 g/t Au
  - SARC 6 10m @ 1.05 g/t Au
  - SARC 7 30m @0.83 g/t Au

Details of the geochemical results can be found in Butler, 1994 (CR 24326)

8.3 **Year Three**
- Soil sampling. 8 lines, with 179 samples at 25m intervals tested for Au and As. One sample showed 41 ppb Au and the remainder ranged from <1 to 5 ppb. As values were low, most being in the range 3-10 ppm. 41 soil samples from the 1993 programme were analysed for Sb and Se but values were very low.
- Geological mapping
- RAB drilling. 157 holes were drilled to follow up anomalous BLEG samples and a strong linear Au anomaly was outlined over a 300m strike length.
- RC drilling. 8 holes with only low grade intersections. The best intersections being:

  SARC 12  26-30m 0.52 g/t  44-48m 0.74 g/t
  SARC 13  50-56m 0.61 g/t
  SARC 16  22-24m 0.50 g/t

- 3 diamond drill holes enhanced stratigraphic knowledge of the prospect and indicated the apparent stratabound nature of the Au mineralisation. Details of the geochemical surveys can be found in Melville, 1995 (CR 12133)

8.4 Year Four
- Soil sampling (eight lines) at Hardtop prospect outlined a small (100m x 50m) Au anomaly.
- Regional soil sampling consisting of 508 samples at 50m intervals and a line spacing of 200m produced no significant results, with Au values generally < 10 ppb.
- BLEG base of slope sampling. 124 5kg -2mm mesh samples in the central area of the regional soil sampling programme produced no significant results.
- Geological mapping
- RAB drilling. A regional programme consisting of 594 holes produced disappointing results in the northern area and only minor anomalism elsewhere. Most results were disappointing but the best results at Hardtop were:

  716500NE
  8538700N 4m @ 2.2 g/t Au, 0.6 g/t Pt, 0.3 g/t Pd from 6m
  8538675N 7m @ 1.3 g/t Au, 0.3 g/t Pt, 0.1 g/t Pd from 6m

- RC drilling. 3 holes at Sargents North tested a Au anomaly but produced no significant results. A single hole at Sargents also produced disappointing results. 4 holes at Hardtop obtained low gold assays in all samples. SARD 2 water bore drilled as a water source for SARD 2 diamond hole produced low Au values apart from the last sample at 58-60m which had a value of 350 ppbAu.
- Diamond drilling. SARD 4 drilled to test the stratigraphy beneath the Tolmer Sandstone revealed detectable Au throughout the hole with the peak being 4.3m @ 44 ppb from 126.2m.
- An aeromagnetic and radiometric survey (1,530 line kms) was flown. Full results of geochemical surveys and geophysical survey flight plans can be found in Williams, 1996 (CR 20245).

8.5 Year 5
- Diamond drilling. A prominent magnetic 'bullseye' anomaly located immediately to the east of Sargents North was tested by SARD 5 and was shown to be a pyrrhotite mineralisation associated with copper, cobalt and nickel sulphides in a proximal mafic volcanic. Samples were assayed for Au, AS, Cu, Pb, Zn, Ni, but all results were disappointing.
- RC drilling. Water bore SARD 2A was tested for Au but results insignificant. Details can be found in Williams, 1997 (CR 21164)

8.6 Year Six
- No work was carried out during this reporting period.
9. ENVIRONMENTAL REHABILITATION REPORT

The Department of Mines and Energy has been notified in writing that all rehabilitation has been completed. This included backfilling of sumps and csteans and capping of all drill holes at least 300mm beneath the surface.

10. REFERENCES


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Williams, K.A., 1996. Annual Report for Exploration Licences 7523 and 7706 (Year Five), 8929 (Year Two), 7885 (Year Three) and AN349 (Year Five), Sargents Area, Batchelor, Northern Territory 22.4.96 to 21.4.97. *Unpublished Report for the NT Department of Mines and Energy*.


BIBLIOGRAPHIC DATA SHEET

REPORT NUMBER: 23976

REPORT TITLE: Final Report, EL 7523, Sargents Area, Northern Territory 31.03.92 to 30.06.99

PROSPECT NAME: Sargents

TENEMENT NUMBERS: EL 7523

OWNER/JV PARTNERS: Aztec Mining Company Limited

COMMODITIES: Gold, Platinum, Palladium, Lead, Zinc

TECTONIC UNITS: Pine Creek Geosyncline

STRATIGRAPHIC UNITS: Whites formation, Tolmer Group, Coomalie Dolomite

1:250,000 MAP SHEET: Pine Creek SD 52-08

1:100,000 MAP SHEET: Batchelor 5171

KEYWORDS: Exploration Review