THIRD AND FINAL REPORT FOR EL9432 (IMPALA)
FOR THE PERIOD 13/05/96 TO 15/12/98
BARROW CREEK DISTRICT, NORTHERN TERRITORY

1:250,000 SHEET REFERENCE: BARROW CREEK SF53-6
1:100,000 SHEET REFERENCE: CRAWFORD 5655

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FEBRUARY 1999
Normandy RN: 50024
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SUMMARY

EL9432 was surrendered on 16 December 1998 after two and a half years of tenure. This report describes the exploration activity and results obtained from EL9432 during the third (part-)year of tenure to 15/12/98 and provides a summary of all exploration carried out on the licence since grant.

The licence formed part of the Barrow Creek Joint Venture, an agreement between Yuendumu Mining Company and Normandy Gold. The project area is located approximately 200 km south of Tennant Creek and approximately 25km northwest of Barrow Creek. It was explored for economic shear hosted and/or "Granites" style gold mineralisation. On the 1st of July 1998, a joint venture agreement between Normandy Gold Pty Ltd and Normandy NFM Ltd was formed, consolidating all exploration tenements in the Tanami-Arunta region, including the existing Barrow Creek Project area. Normandy NFM were appointed managers of the JV. Significant disruptions to proposed field programs and reductions to exploration budgets have resulted in the need to rationalise and prioritise the BCJV's tenement holding in the region. As a result, the decision was made to surrender EL9432.

The first relinquishment for EL9432 was waived by the NTDME. As a result, the licence remained of 70 graticular blocks (225km²) at the time of its surrender.

No in-ground exploration was undertaken during the third (part-)year of tenure as a result of significant reductions to the exploration budget and disruption due to hand over of the project management from the Normandy team in Tennant Creek to Normandy NFM in Alice Springs/Adelaide.

A summary of exploration for the life of the tenement is documented below.

Exploration during the second year of tenure comprised:

- A total of 48 vacuum holes for 247m in order to infill zones of anomalous geochemistry identified in vacuum drilling during the first year of tenure at the Ringing Rocks prospect. No anomalism of note was reported.

- A total of 13 RAB holes for 352m were drilled so as to explain the anomalism generated by the year 1 vacuum drilling and the failure of the year 2 drilling to repeat the results. No results of significance were again reported.

Exploration during the first year of tenure consisted of:

- Vacuum geochemistry drilling for a total of 327m in 67 holes at the Ringing Rocks prospect. A wide variety of altered rock types were intersected with low-order anomalism in scattered Bi and Au results.

- Regional Airborne magnetic and radiometric survey - 100m-line spaced at 40m mean flying height.

- Regional Regolith Survey - identifying valley plain colluvial detritus as the dominant regolith type.
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1. INTRODUCTION

Exploration Licence 9432, which formed part of the Barrow Creek Group of tenements, was explored for "Granites" style and/or shear hosted gold/copper mineralisation. After three years of tenure, the licence has been surrendered.

2. TENEMENT DETAILS

Exploration Licence 9432, composed of 70 graticular blocks, was applied for and subsequently granted to Normandy on the 13th of May 1996. As the licence fell within the Barrow Creek Joint Venture (BCJV) area of interest, the licence was included under the Joint Venture Agreement. Normandy NFM entered into, and became the operators of, the BCJV on the 1st of July 1998. The present breakdown between the JV partners is as follows:

- Normandy Gold Pty Limited 42.5%
- Normandy NFM Limited 42.5%
- Yuendumu Mining Company 15%

<table>
<thead>
<tr>
<th>Date</th>
<th>Blocks</th>
<th>Km²</th>
<th>Expiry</th>
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<tr>
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<td>13/05/96</td>
<td>70</td>
<td>225</td>
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<td>First Relinquishment:</td>
<td>12/05/98</td>
<td>Waived</td>
<td>12/05/02</td>
</tr>
</tbody>
</table>

Table 1: Tenement Summary, EL9432 (Impala)
3. LOCATION, ACCESS AND PHYSIOGRAPHY

Exploration Licence 9432 is located approximately 200km south of Tennant Creek and 25km northwest of the Barrow Creek Hotel. It lies within Neutral Junction Station (NT POR. 3375). Access is via station tracks and the Stuart Highway (refer Figure 1).

4. PREVIOUS EXPLORATION

4.1 Previous Exploration by Other Companies

There is little evidence of past non-Normandy exploration within the area of EL9432 itself prior to Normandy being granted the licence on the 13th of May 1996.

Within the Barrow Creek area, Kewanee Australia Pty Ltd undertook a broad exploration program of the Crawford-Osborne Range area between 1970-1974. Several targets were delineated by a combination of airborne magnetics, radiometrics and EM survey techniques. Targets generated by this method were followed up with geological mapping, sampling and a combination of percussion, reverse circulation and diamond drilling. This work delineated a Cu-Ni resource (Prospect D), but the grade was considered too low to warrant further investigation and the ground was relinquished in 1973.

Australis Mining NL conducted limited exploration during 1969, for base metal potential in the Crawford Range area. Pegmatites, granites and metadolerites were targeted with disappointing results.

4.2 Previous Exploration by Normandy

Normandy Gold Pty Limited explored the area between 1993 to 1995 under EL8177 (Millers). Work completed by Normandy Gold Pty Limited on EL8177 included:

- Regional Gravity Survey
- Regional RAB Drilling - 6 holes for 300m
- Regional Soil Sampling - 60 samples

The gravity survey indicated that the area within EL9432 covers a northeast-orientated gravity gradient. Six RAB holes drilled on the licence as part of a regional drilling program indicated that granite was the predominant bedrock lithology.

Regional soil geochemistry in the eastern part of EL9432, covered the "Ringing Rocks" skarn outcrop. No anomalous geochemistry results worthy of follow up were identified. All results are reported Mujdrica (1995).
5. GEOLOGY

5.1 Regional Geology

The oldest exposed basement in central Australia comprises metamorphic and igneous rocks of the Arunta Inlier (Haines et al., 1991). Rocks of the Arunta Inlier are interpreted as being at least partly correlative with sedimentary and volcanic sequences of the adjacent Tennant Creek and Granites-Tanami Inliers.

The Arunta Inlier (Early-Middle Proterozoic) is characterised by metamorphosed sedimentary and igneous rocks of low to medium pressure facies. Deformation and regional metamorphism to upper greenschist facies took place between 1810-1750 Ma (Black, 1981). Shaw and Stewart (1975) established three broad stratigraphic subdivisions based on facies assemblages and lithological correlations. From oldest to youngest, these subdivisions are named Division 1, 2 and 3. Using this model defined by Shaw and Stewart (1975), the orthogneiss east of Osborne Range, the calc-silicate rocks west of Crawford Range and the Bullion Schist would be included in Division 2, and the Ledan Schist in Division 3 of the Arunta Inlier.

Unconformably overlying these rocks are the Hatches Creek Group sediments and volcanics. Blake et al. (1987) formally subdivided the Group into the Ooradidgee, Wauchepe and Hanlon Subgroups, comprising a total of 20 Formations and two Members. The Hatches Creek Group is a folded sequence of shallow-water sediments with interbedded volcanic units which reach thicknesses of at least 10,000 metres.

The sediments include ridge-forming quartzites, felspathic, lithic and minor conglomeratic arenites and friable arenite, siltstone, shale and carbonate. The Ooradidgee Subgroup consists mainly of fluvial sediments and sub-aerial volcanics which partly intertongue. The Wauchepe Subgroup is characterised by large volumes of volcanics and sediments probably both marine and fluvial in origin. The Hanlon Subgroup may be entirely marine and lacks volcanics (Blake et al., 1987).

Deformation and regional metamorphism took place between 1810-1750 Ma (Black, 1981). Folding was about NW trending axes while metamorphism to upper greenschist facies took place. Later intrusion of both the Arunta basement and the Hatches Creek Group by granitoids of the Barrow Creek Granitic Complex took place around 1660 Ma (Blake et al., 1987). Contact metamorphism and metasomatism are often observed.

Sedimentation associated with the Georgina Basin commenced during the Late Proterozoic with the Amersbury Quartzite and was terminated during the Early Devonian after deposition of the Dulcie Sandstone. The Georgina Basin sequence was mildly affected by the Carboniferous Alice Springs Orogeny.

A long erosional period followed with subsequent deep weathering during the Tertiary produced silcrete and ferricrete horizons. A thin veneer of Quaternary sands and soils overlay much of the area, except where recent and active alluvial sedimentation is present.

5.2 Local Geology

Surface geology within the licence consists of a thin layer (<6m) of colluvial/aeolian cover and isolated outcrop. In the west of the licence, a series of outcropping quartz-pegmatite veins occur amongst isolated outcrops of skarn that trend in an east-west direction. The skarn is known locally as the Ringing Rocks prospect. A large fault-fill quartz-silica breccia vein also occurs in the south of the licence and trends east-west.

The geology of the Ringing Rocks prospect consists of outcropping quartz/pegmatite veining, calc-silicate/skarns, hornfels schist and amphibolites. The geology of the area is quite complex although the general trend of the outcrops is WNW. It is thought that the Ringing Rocks area represents a large roof pendant on top of an intrusive granite body. Abundant pegmatite veins are observed in the area and are thought to be associated with the interpreted underlying granite. As well, the contact metamorphic effects have produced the hornfels schist and epidote-amphibolite-diopside skarns from calcium rich units of the Bullion Schist.
6. WORK UNDERTAKEN DURING THE THIRD YEAR OF TENURE (13/05/98 to 15/12/98)

No in-ground fieldwork was conducted within EL9432 during the third (part-) year of tenure. This was a result of significant reductions to the exploration budget and disruption due to hand over of the project management from the Normandy team in Tennant Creek to Normandy NFM in Alice Springs/Adelaide. A significant period of tenement evaluation and comparative ranking took place after Normandy NFM assumed operational management. This involved all tenements within the BCJV. Although results of significance have been reported from the Ringing Rocks prospect in the far west of the tenement, there has been a lack of results indicative of economic gold mineralisation to date. The licence also received a relatively poor ranking against other tenements held by the BCJV. As a result, EL9432 was subsequently surrendered.

Proposed work (Normandy - Tennant Creek Operations) for the period had included drill testing a series of linear east-west trending magnetic features, as well as follow up drilling of weakly anomalous Au values returned from the regional RAB drilling completed in year two of tenure.

7. WORK UNDERTAKEN DURING THE FIRST TWO YEARS OF TENURE (13/05/96 to 12/05/98)

7.1 Vacuum Geochemistry Drilling

Completed on a 500m by 100m-spaced grid, a tractor-mounted vacuum drilling program was completed over the Ringing Rocks prospect (in the far west of the tenement) during the first year of tenure. Tracey's Drilling based in Tennant Creek were the drilling contractor and completed a total of 61 holes for 327m. The reader is referred to Figure 2 for drillhole location details.

All samples for geochemical analysis were sent to Australian Laboratory Services (ALS) in Townsville where they were analysed for low-level Au, As and a selection of multielements (as reported by Morris, 1997).

As reported by Morris (1997), the drilling campaign intersected a variety of rock types including skarns, quartz-feldspar-muscovite-tourmaline pegmatite, amphibolites, muscovite-biotite schists, quartz veins and felsic granites. Anomalous geochemistry results included 99ppm Bi and 12ppb Au.

7.2 Regolith Mapping

A regolith and landform mapping exercise was undertaken over the BCJV tenements in 1996, utilising aerial photography, Landsat TM imagery and regional field traverses. The survey was completed with the aim of providing a reliable geomorphological framework to assess past and possible future surface geochemistry.

Mapping of EL9432 indicates that the licence is dominated by valley plain colluvial detritus with associated mulga/acacia vegetation. Areas of alluvial sheetwash and active drainage were found to be present in the south of the licence. Refer to Morris 1997, Figure 14, for regolith map.

7.3 Regional Airborne Magnetics and Radiometrics Survey

A detailed (100m line-spaced) aerial survey was completed over EL9432 around the time of its first year of tenure. Flown at a mean height of 40m, the survey was designed to identify structural and lithological boundaries below the extensive cover. The Ringing Rocks prospect was found to be observable as an area of relatively high magnetic character (compared to the bulk of the tenement). Digital data from this survey can be found in Appendix 1.
7.4 Follow-up Vacuum Drilling

As reported by Libby (1998), a total of 48 vacuum drill holes were drilled for 247m in order to infill zones of anomalous geochemistry identified in the earlier vacuum drill program (Morris, 1997). The reader is referred to Figure 2 for location details.

Samples were sent to ALS and analysed for low-level Au and As as well as for a selection of multielements (Libby, 1998). The initial vacuum anomalism was not repeated, with a maximum gold value of 1.80ppb being returned.

The predominant rock types encountered were granitoid and hornfelsed felsic schist.

7.5 RAB Drilling

A total of 13 RAB holes were drilled during the second year of tenure for 352m (Figure 2). They were drilled in order to explain the source of anomalous vacuum geochemistry identified in the initial vacuum program. Samples were sent to ALS and analysed for Au, As and a selection of multielements as detailed by Libby (1998).

Results were again disappointing with no zones warranting further follow-up being identified.
8. EXPENDITURE INCURRED FOR THE REPORTING PERIOD

A summary of exploration expenditure for the two and a half years of tenure is presented below in Table 2. A breakdown of costs for the third part-year of tenure is outlined in Table 3.

Table 2: Summary of Exploration Expenditure for EL9432

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<td>Year 2</td>
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Table 3: Details of Exploration Expenditure for the Period 13/05/98 to 15/12/98

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<td>COVENANT</td>
<td>24 000</td>
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</tbody>
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9. REFERENCE LIST / ANNUAL REPORT BIBLIOGRAPHY

References


Reports to NT DME

Libby, J., 1998. Second Annual Report for Exploration Licence 9432 for the period 13/05/97 to 12/05/98, Barrow Creek District, Northern Territory. Report to the NTDME. Normandy Gold Pty Ltd.

Morris, T., 1997. First Annual Report for Exploration Licence 9432 for the period 13/05/96 to 12/05/97, Barrow Creek District, Northern Territory. Report to the NTDME. Normandy Gold Pty Ltd.

Appendix 1: Digital Data from Detailed Airborne Magnetics and Radiometrics Survey

3.5" disk containing the following file (Excel format): EL9432AMAG.XLS