This report details exploration undertaken on MLCs 96-97, 124 & 276-280 forming the Bishops Creek Leases of the Occidental Reporting Group for the period 1 August 1997 to 25 March 1999. MLC 124 is known as Quartz Hill and MLCs 97-97 & 276-280 as Osprey (or TC-35).

The Bishops Creek Leases are located approximately 24km NNW of Tennant Creek, 10km west of the Stuart Highway by station tracks located opposite Three Ways. The Quartz Hill lease (MLC 124) is located approximately 15km north of Tennant Creek township, approximately 500m south of the Quartz Hill Trig Station. Access is gained via an unsealed track west from the Stuart Highway.
CONTENTS

1 CONCLUSIONS & RECOMMENDATIONS
2 INTRODUCTION
3 LOCATION & ACCESS
4 TENURE
5 REGIONAL GEOLOGY
6 LOCAL GEOLOGY
7 PREVIOUS WORK
   7.1 MLCs 96-97 & 276-280 (TC-35, Osprey)
   7.2 MLC 124 (Quartz Hill)
8 WORK CARRIED OUT DURING REPORTING PERIOD
   8.1 Prospectivity and Data Review
9 EXPENDITURE STATEMENT FOR THE PERIOD 1/8/97 TO 25/3/99
10 RECOMMENDED WORK PROGRAMME & PROPOSED EXPENDITURE
    FOR THE PERIOD 26/3/99 TO 25/3/00
11 ENVIRONMENTAL/REHABILITATION REPORT
12 REFERENCES
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure No</th>
<th>Title</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bishops Creek Leases, Location Plan</td>
<td>1:100,000</td>
</tr>
</tbody>
</table>

# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table No</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bishops Creek Leases Tenure</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Exploration Expenditure for the Bishops Creek Leases from 1 August '97 to 25 March 1999</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Proposed Exploration Expenditure for the Bishops Creek Leases</td>
<td>5</td>
</tr>
</tbody>
</table>

# LIST OF APPENDICES

<table>
<thead>
<tr>
<th>Appendix No</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bibliographic Data Sheet</td>
</tr>
</tbody>
</table>
1 CONCLUSIONS & RECOMMENDATIONS

Work completed by Normandy Tennant Creek Pty Limited (Normandy) during the reporting period included a review of the prospectivity of the claims and leases that initially formed the Bishops Creek group of leases. This review led to the surrender of MCCs 100-114, 145-154 & 1063-1064 and MLC 185 on 30 September 1998.

Work will include a review of the prospectivity of the remaining leases. All work on MLCs 96-97 & 276-280 (TC-35, Osprey) will be done in conjunction with work on EL 9661 (Picasso), and ELA 10325 (Los Alamos) which covers the leases as soon as the licence will be granted.

2 INTRODUCTION

This report details exploration undertaken on MLCs 96-97, 124 & 276-280 forming the Bishops Creek Leases of the Occidental Reporting Group for the period 1 August 1997 to 25 March 1999.

3 LOCATION & ACCESS

The Bishops Creek Leases are located approximately 24km NNW of Tennant Creek, 10km west of the Stuart Highway by station tracks located opposite Three Ways. The Quartz Hill lease (MLC 124) is located approximately 15km north of Tennant Creek township, approximately 500m south of the Quartz Hill Trig Station. Access is gained via unsealed track west from the Stuart Highway (Figure 1).

The climate of the Tennant Creek district is mild and dry through most of the autumn to spring months. The summer period is hot with seasonal heavy rainfall between January and March making access very difficult during these periods.

4 TENURE

MLC 124 is known as Quartz Hill and MLCs 96-97 & 276-280 as Osprey (or TC-35).

A tenure summary is presented in Table 1 below:

<table>
<thead>
<tr>
<th>Title</th>
<th>Tenement Name, Location</th>
<th>Area (ha)</th>
<th>Date Granted</th>
<th>Date Expires</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLC 96</td>
<td>Bishops Creek, Osprey, TC35</td>
<td>16.00</td>
<td>30/07/71</td>
<td>31/12/12</td>
<td>Renewed 92</td>
</tr>
<tr>
<td>MLC 97</td>
<td>Bishops Creek, Osprey, TC35</td>
<td>16.00</td>
<td>30/07/71</td>
<td>31/12/12</td>
<td>Renewed 92</td>
</tr>
<tr>
<td>MLC 276</td>
<td>Bishops Creek, Osprey, TC35</td>
<td>17.00</td>
<td>15/12/75</td>
<td>31/12/12</td>
<td>Report 06/10/95</td>
</tr>
<tr>
<td>MLC 277</td>
<td>Bishops Creek, Osprey, TC35</td>
<td>17.00</td>
<td>15/12/75</td>
<td>31/12/85</td>
<td>Report 06/10/95</td>
</tr>
<tr>
<td>MLC 278</td>
<td>Bishops Creek, Osprey, TC35</td>
<td>17.00</td>
<td>15/12/75</td>
<td>31/12/95</td>
<td>Report 06/10/95</td>
</tr>
<tr>
<td>MLC 279</td>
<td>Bishops Creek, Osprey, TC35</td>
<td>17.00</td>
<td>15/12/75</td>
<td>31/12/95</td>
<td>Report 06/10/95</td>
</tr>
<tr>
<td>MLC 280</td>
<td>Bishops Creek, Osprey, TC35</td>
<td>17.00</td>
<td>15/12/75</td>
<td>31/12/95</td>
<td>Report 06/10/95</td>
</tr>
<tr>
<td>MLC 124</td>
<td>Quartz Hill</td>
<td>17.00</td>
<td>22/02/72</td>
<td>31/12/92</td>
<td>Report 24/09/92</td>
</tr>
</tbody>
</table>
5 REGIONAL GEOLOGY

The geological understanding of the Tennant Creek Inlier has been recently advanced by detailed geological mapping over the Tennant Creek and Flynn 1:100,000 map sheets (Donnellan et. al. 1995), precision dating of stratigraphic components of the region (Compston, 1995) and regional geophysical interpretations.

The oldest exposed Proterozoic lithofacies in the Tennant Creek Inlier are the metasedimentary rocks of the Warramunga Formation, which are the hosts to the ironstone Au-Cu-Bi mineralisation of the Tennant Creek Goldfield. These Palaeoproterozoic metasediments were deposited approximately 1860 Ma. Deformation and intrusion of the Warramunga Formation by voluminous porphyries and granitoids occurred during the Barramundi Orogeny (1858 Ma to 1845 Ma).

Following deformation and uplift the volcanics and volcanioclastics of the Flynn Sub-Group were erupted (1845 Ma to 1827 Ma), with intrusion of porphyries and minor granitoids into the Warramunga Formation. An additional deformation event preceded the deposition of the Hatches Creek Group/Tomkinson Creek Sub-Group (1820 Ma to 1785 Ma) and the intrusion of late-stage granitoids and porphyries into both the Warramunga Formation and Flynn Sub-Group at 1650-1712 Ma.

6 LOCAL GEOLOGY

The Bishops Creek leases area contains many low-lying hills with abundant outcrop. Much of the area is composed of colluvial scree and dissected colluvial fans. Minor areas of alluvium are associated with the upper reaches of Bishops Creek. Outcrop in the Bishops Creek leases is dominated by siltstone to fine grained sandstone units of the Warramunga Formation, with tuff, tuffaceous sandstone, and siltstone units of the Bernborough Formation to the NE, and outcrops of felsic porphyry intruding the Warramunga Formation to the south and west. The contact of the Bernborough Formation and Warramunga Formation is mapped trending NW in a line defined approximately by linking the Cleo’s Gift workings to Mt Argo, parallel to the axis of a NW plunging anticline. The Bishops Creek shear is located to the SW of and approximately parallel to this fold axis. Areas of ironstone outcrop are within shear zones in the Warramunga Formation (West, 1997).

MLC 124: the Tennant Creek Granite dominates outcrop within the lease with northsouth trending quartz veins, and in the north the dominant trend of exposed quartz veins is west-north west (West, 1997).

7 PREVIOUS WORK

Several companies have explored the area surrounding the leases in recent times.

Newmont Australia Limited explored the area in a joint venture agreement with Australian Development Limited (ADL) under EL 5067 and EL 5133 (White Hill Project) in the late 1980s. Work completed by the joint venture partners on ELs 5067 and 5133 included geological mapping, the interpretation of the low-level airborne magnetics survey flown by Austrex in 1984, satellite imagery, regional and detailed soil sampling, outcrop sampling, ground magnetics surveying, vacuum drilling and RAB drilling. All exploration results are presented in Pearson (1988, 1989), Preston (1990), Penney (1990), Davenport (1991), Lowe (1992a) and Schusterbauer (1992, 1993).
Metana Minerals NL explored the area in the late 1980s in a joint venture agreement first with Allender & Lebrun, then with Placer Exploration Limited under EL 5625 (Gecko East Prospect). Work completed by the joint venture partners included a photogeological interpretation, ground magnetics surveying, soil sampling, bedrock geochemistry, RC drilling, stream sediment sampling, aeromagnetic interpretation, ground magnetics, RC drilling, petrographic analysis, vacuum bedrock drilling and RAB bedrock drilling. In the late 1980s, Metana Minerals NL identified a magnetic anomaly within the southern graticular block from aeromagnetic data and contracted Placer Exploration Limited to carry out a ground magnetic survey. The results of this survey are unknown. All other results are detailed in Eeles & Wright (1989), Pearson (1990) and Standing (1991).

PosGold Limited (PosGold; now Normandy) explored the area in the early 1990's under EL 7099 (Mercury Prospect). Work completed by PosGold on the licence included the interpretation of the low-level airborne magnetics survey flown by Austrex in 1984, the interpretation of Landsat Thematic Mapper imagery, a soil geochemical survey and a photogeological interpretation. All exploration results are detailed in Lowe (1991, 1992b, 1993).

Asarco Australia Limited explored the area in a joint venture agreement with Giants Reef Mining NL in the mid-1990s under EL 7181 (Orlando Prospect). Work completed by the joint venture partners included gridding, vacuum drilling, aeromagnetic contouring and is detailed in England (1994).

Roebuck Resources NL explored the area in a joint venture agreement with Normandy NFM Limited (NFM) in the early 1990s under ELs 7407, 7408, 7446 and 7649 (Gecko Cleo Group). Work completed by the joint venture partners included geological mapping, soil sampling, rock chipping and is detailed in Fox (1992) and Hatcher & Halfpenny (1993a, b & c). Roebuck Resources NL explored the area in a joint venture agreement with NFM then under SEL 8777 between 16 September 1994 and 15 September 1997. No reports on the SEL are available in the Normandy's Exploration library.

Western Mining Corporation Limited (WMC) explored the area in the early 1990s under EL 7527 (Memorial Prospect). Work completed by WMC included an interpretation of the available geophysical data (Ward, 1994).

NFM explored the area under EL 8640 between 15 June 1994 to 14 June 1996. Giants Reef Mining NL explored the area under EL 9303 (Mount Argo). No reports on these ELs are available in the Normandy's Exploration library.

PosGold explored the area in the mid-1990s under EL 9177 (Donatello Prospect). Work completed by PosGold on the licence included the interpretation of a regional aeromagnetic and gravity survey, photogeological mapping, rock chip sampling and vacuum drilling. All results are detailed in Hatcher (1998) and Ward (1997a). PosGold then explored the area under SEL 9661 (Splinter) between 1994 and 1997. Work completed by PosGold during the period of tenure included a regional gravity survey interpretation, a regional aeromagnetic survey interpretation, photogeological mapping, vacuum drilling and rock chip sampling. All the results are presented in Mujdrica (1995), Chambers (1996) and Stott (1997). Normandy is currently exploring the two blocks immediately east of the claims and leases under EL 7661 (Picasso Prospect). Work completed during the first year of tenure included rock chip sampling and assaying and is detailed in Ward (1997b).
7.1 MLCs 96-97 & 276-280 (TC-35, Osprey)

MLCs 96-97 were initially granted to ADL in 1971 and MLCs 276-280 were granted to Nobelex NL in 1975. In the early 1970s ADL explored the area under EL 96 as managers of Nobelex NL's Tennant Creek District interests. Work over EL 96 included geological mapping, sampling, geophysical surveying and diamond drilling. All work completed on TC-35 is presented in Larson (1971), Webster (1971) and ADL (1972, 1974). One diamond drillhole (137 m) was completed by ADL in 1973 to test for mineralisation below a gossanous outcrop. The drillhole intersected a sequence of sheared shales, rhyolitic tuffs and tuffaceous siltstones but no significant mineralisation (In Mujdrica, 1995). Surtron Technologies Pty Limited probed the holes in 1989 for ADL (Surtron, 1989).

An application for the renewal of MLCs 96-97 was lodged in 1991 (Edwards, 1991) and the leases were renewed for a period of 21 years in 1992. An application for the renewal of MLCs 276-280 was lodged in 1995 (Mujdrica, 1995), the leases haven't been renewed yet by the DME.

PosGold explored an area covering MLCs 96, 97, partly 154, 185 and 276-280 under Exploration Licence 9150 (Leonardo). Work completed by PosGold during the life of tenure included vacuum drilling (204 holes, 1046m); a ground magnetic survey; rock chipping and RAB drilling (7 holes, 357m). All the results are presented in Chambers (1996), Ward (1997) and Mouchet (1998).

7.2 MLC 124 (Quartz Hill)

There is no record of any historical metalliferous mining production, with the nearest mining operation to MLC 124 being a granite quarry to the north. Exploration activity over the Quartz Hill Prospect has been restricted to an aeromagnetic survey flown in 1984, and regional gravity, geology, and regolith mapping surveys conducted by Poseidon Gold Limited (subsequently PosGold, now Normandy) in the early 1990s. This activity has been reported previously in Lowe (1992).

No exploration activity has been undertaken on MLC 124 during the period 1 August 1996 to 31 July 1997 (West, 1997).

8 WORK CARRIED OUT DURING REPORTING PERIOD

8.1 Prospectivity and Data Review

Work completed during the reporting period included a review of the prospectivity of the claims and leases that initially formed the Bishops Creek group of leases. This review lead to the surrender of MCCs 100-114, 145-154 & 1063-1064 and MLC 185 on 30 September 1998. A final report for MCCs 100-114, 145-154 & 1063-1064 and MLC 185 was lodged at the DME Office in Tennant Creek (West & Mouchet, 1998).

9 EXPENDITURE STATEMENT FOR THE PERIOD 1/8/97 TO 25/3/99

During the reporting period the Bishops Creek Leases incurred an estimated exploration expenditure of $6,500. A breakdown of this expenditure follows (Table 2):
Table 2: Exploration Expenditure for the remaining Bishops Creek Leases from 1/8/97 to 25/3/99

<table>
<thead>
<tr>
<th>EXPENSE</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employee Costs</td>
<td>$ 2,500</td>
</tr>
<tr>
<td>Overheads</td>
<td>$ 200</td>
</tr>
<tr>
<td>Drilling</td>
<td>$ 0</td>
</tr>
<tr>
<td>Assays</td>
<td>$ 0</td>
</tr>
<tr>
<td>Operating Costs</td>
<td>$ 1,000</td>
</tr>
<tr>
<td>Specialist Services</td>
<td>$ 400</td>
</tr>
<tr>
<td>Tenement Costs</td>
<td>$ 2,400</td>
</tr>
<tr>
<td>Research</td>
<td>$ 0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$ 6,500</strong></td>
</tr>
</tbody>
</table>

10 RECOMMENDED WORK PROGRAMME & PROPOSED EXPENDITURE FOR THE PERIOD 26/3/99 TO 25/3/00

Work will include a review of the prospectivity of the remaining leases. All work on MLCs 96-97 & 276-280 (TC-35, Osprey) will be done in conjunction with work on EL 9961 (Picasso), and ELA 10325 (Los Alamos) which covers the leases as soon as the licence will be granted. The proposed exploration expenditure for the Bishops Creek Leases for the period 26 March 1999 to 25 March 2000 is as follows (Table 3):

Table 3: Proposed Exploration Expenditure for the Bishops Creek Leases

<table>
<thead>
<tr>
<th>EXPENSE</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employee Costs</td>
<td>$ 1,500</td>
</tr>
<tr>
<td>Overheads</td>
<td>$ 200</td>
</tr>
<tr>
<td>Drilling</td>
<td>$ 0</td>
</tr>
<tr>
<td>Assays</td>
<td>$ 0</td>
</tr>
<tr>
<td>Operating Costs</td>
<td>$ 500</td>
</tr>
<tr>
<td>Specialist Services</td>
<td>$ 500</td>
</tr>
<tr>
<td>Tenement Costs</td>
<td>$ 1,200</td>
</tr>
<tr>
<td>Research</td>
<td>$ 50</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$ 3,950</strong></td>
</tr>
</tbody>
</table>

11 ENVIRONMENTAL/REHABILITATION REPORT

Normandy has commenced an active rehabilitation programme over much of the Tennant Creek field. This commitment has been reinforced within the Normandy Group with the appointment of a Group Environmental Engineer to oversee and implement the Group's guidelines and objectives. In addition to this an Environmental Superintendent has been engaged at Tennant Creek to design and implement the Group's objectives throughout the Tennant Creek area.

As an example of the Group's commitment to environmental issues several active rehabilitation programmes are currently being undertaken in the Tennant Creek field. These include programmes at Nobles Nob, Eldorado, White Devil and Warrego.

Environmental Management Plans for the Company's Tennant Creek Operations (Fowler, 1993; Fowler et al., 1998) have been submitted to the Department of Mines and Energy under separate cover. These plans detail the strategies to be implemented over various areas following completion of exploration programmes and mining operations.
REFERENCES


Fox, K (1992): Annual and final report on exploration completed during the year ending 29/7/92, for the Gecko, Cleo Group comprising EL 7407, 7408, 7446 and 7649, Volume 1 of 1. Roebuck Resources/North Flinders Mines Ltd Joint Venture Report to NTDME CR92/556 (92070).


Resources/North Flinders Mines Ltd Joint Venture Report to NTDME CR93/739 (93251).


Pearson, J (1990): Annual report for EL 5625, Gecko project group, for the 12 months ending 31/1/90, volume 1 of 1. Metana Minerals NL/Placer Exploration Limited Joint Venture Report to the NTDME CR90/449 (90019).


APPENDIX ONE

BIBLIOGRAPHIC DATA SHEET
BIBLIOGRAPHIC DATA SHEET

REPORT NUMBER: TENNANT CREEK: 99038       ADELAIDE: 23969

REPORT NAME: ANNUAL REPORT FOR MLCs 96-97, 124 & 276-280
FOR THE YEAR ENDING 25 MARCH 1999,
OCCIDENTAL REPORTING GROUP, BISHOPS CREEK
LEASES, TENNANT CREEK 1:250,000 MAP SHEET NO
SE53-14, VOLUME 1 OF 1.

PROSPECT NAMES: OSPREY, TC35, QUARTZ HILL

TENEMENT NUMBERS: MLCs 96-97, 124 & 276-280

OWNER/JV PARTNERS: NORMANDY TENNANT CREEK PTY LIMITED

AGREEMENT:

COMMODITIES: GOLD, COPPER

TECTONIC UNITS: TENNANT CREEK INLIER

STRATIGRAPHIC UNITS: WARRAMUNGA FORMATION

1:250,000 MAP SHEET: TENNANT CREEK SE53-14

1:100,000 MAP SHEET: FLYNN 5759

KEYWORDS: EXPLORATION REVIEW, EXPLORATION PROPOSAL