CRA EXPLORATION PTY. LIMITED

EL 3537 GOSSE RIVER
ANNUAL REPORT
PERIOD ENDING 13 JUNE 1984

OPEN FILE

Submitted by: B.E. HARVEY
Accepted by: W.H. JOHNSTON
Date: JULY 1984
Copy to: N.T. Dept of Mines & Energy
CRAE - Canberra
CRAE - Darwin

The contents of this report remain the property of C.R.A. Exploration Pty. Limited and may not be published in whole or in part nor used in a company prospectus without the written consent of the Company.

Northern Territory Geological Survey

Map reference:
Tennant Creek SE53-14

Report No: 12652
<table>
<thead>
<tr>
<th>CONTENTS</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. SUMMARY</td>
<td>1</td>
</tr>
<tr>
<td>2. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>3. CONCLUSIONS</td>
<td>1</td>
</tr>
<tr>
<td>4. GEOLOGY</td>
<td>2</td>
</tr>
<tr>
<td>5. AEROMAGNETIC SURVEY</td>
<td>3</td>
</tr>
<tr>
<td>6. GROUND MAGNETIC FOLLOW-UP</td>
<td>4</td>
</tr>
<tr>
<td>7. REFERENCES</td>
<td>6</td>
</tr>
<tr>
<td>8. KEYWORDS</td>
<td>6</td>
</tr>
<tr>
<td>9. LIST OF PLANS</td>
<td>6</td>
</tr>
</tbody>
</table>

APPENDIX I - Ground magnetic profiles
1. SUMMARY

CRA Exploration Pty Ltd (CRAE) are exploring for Tennant Creek type ironstone-hosted gold deposits within EL 3537, Gosse River. A low-level (80m) aeromagnetic survey was flown to identify magnetic responses similar to those occurring over known gold-bearing ironstone bodies on the Tennant Creek Goldfield. Two responses were identified as targets for ground follow-up. These were located on the ground, in areas of total sand cover and detailed ground magnetic surveys were carried out. The two responses have been modelled as due to shallow bodies, 20-200m deep. Drill targets have been selected accordingly.

2. INTRODUCTION

Following recommendations by G.P. Jenke the Gosse River area was selected as prospective for Tennant Creek ironstone gold deposits. The centre of the Tennant Creek Goldfield lies 70km along regional geological trend to the NW. Detailed low-level aeromagnetic survey was selected as the most cost effective exploration technique in this area of near complete sand cover. The aeromagnetic survey was flown in December, 1983. The area was reduced to 74 blocks on 2 May 1984.

3. CONCLUSIONS

Two magnetic responses occurring in areas of extensive sand cover are similar to responses developed over gold-bearing ironstones on the Tennant Creek Goldfield. The features causing the responses are likely to be shallow, of the order 20m to 200m to the top of the centre of the bodies.
4. GEOLOGY

The potential for gold-bearing ironstones within the Gosse River area is, in part, based on the proximity to known gold deposits within the Tennant Creek Goldfield. Known gold deposits at Tennant Creek are hosted in unique quartz hematite/magnetite bodies of a generally discordant nature within a volcanogenic turbidite sequence of Lower Proterozoic age; the Warramunga Group. Auriferous Warramunga exposure is restricted to an area elongate by 100km parallel to NW-SE structural trends. Some of these regional structural trends, notably prominent quartz reefs marking major faults, pass SE through the Gosse River area. Exposure within the Gosse River area is restricted to these rare quartz reefs trending NW-SE and also NE-SW. The remaining area within the EL, over 99%, is under shallow sand cover. Warramunga sediments have been mapped by the BMR as isolated outcrops on the western margin of the EL.

Interpretation of regional magnetics suggests granite may be prominent beneath cover within part of the EL. Several NW and NE trending regional magnetic dislocations suggest Warramunga basin sediments and granites persist beneath cover.
5. **AEROMAGNETIC SURVEY**

Aeromagnetics was selected as the most cost effective way of selecting exploration targets beneath cover within the Gosse River Area. On the Tennant Creek Goldfield itself magnetic techniques have been directly, or indirectly, responsible for the discovery of seven moderately sized gold-copper orebodies.

A contract to fly aeromagnetics over Gosse River was let to EG & G Geometrics in November, 1983, and the survey was flown in December, 1983.

The aircraft used was a Britten Norman Islander. Flight lines were flown at 300 metre intervals in 000°-180° true directions; tie lines were flown at 3000m intervals in 090°-270° true directions. Mean terrain clearance was maintained at 80m. Navigation was by visual means with assistance from a Doppler navigation system (Singer GPK-1000 Radar Doppler); a Sperry Gyro stabilised compass and TNC-50 Navigation Computer. Flight lines were recorded on a Geocam 35mm Tracking Camera and later transferred to 1:25 000 aerial photography. Terrain clearance was continuously recorded using a Sperry AA-210 Radar Altimeter.

The magnetometer system comprised a Geometrics Airborne Proton Magnetometer G-813 interfaced to a Geometrics Model G-714 geophysical data formatting/recording unit. Data were stored on a 9 track magnetic tape for subsequent computer processing. A Geometrics Recording Base Station Model G-866 with an analog recorder was used as a diurnal monitor and run continuously during the survey periods.

Two lines, lines 22 and 53, were re-flown because of exceeding line spacing specifications and exceeding diurnal specifications respectively.
Data are presented as flight lines, line profile and contoured plots on Plans NTd 3439 through to NTd 3450, NTd 3496 through to NTd 3501. Interpretation of contoured data suggests structural dislocations and two discrete dipolar magnetic anomalies reminiscent of Tennant Creek type ironstone features. These interpretations are presented on Plan NTd 3519.

6. **GROUND MAGNETIC FOLLOW-UP**

Two dipolar aeromagnetic features were selected for first pass detailed investigation. (see Plan NTd 3519). The features were located on the ground with the assistance of flight line photography. Once located, grids were established over the features and a detailed ground magnetic survey was carried out. The grids were established on magnetic bearings and by back-sighting using Toyota odometer to measure distances. The base lines were marked by star pickets at 100m intervals; traverses were marked by 1m wooden pegs.

The ground magnetic surveys were carried out over four days and run in loops to allow diurnal corrections to be made. The instruments used were Scintrex MP-2 magnetometers. Data were hand recorded and transferred to computer tape at a later data. All profiling, contouring and modelling of data was carried out on a Tektronix 4052 computer.

Ground magnetic profiles are presented in Appendix 1. Contoured data are presented in Plans NTd 3520 and NTd 3521. Description of anomalies and modelled magnetic bodies are presented below.
6.1. Anomaly GR1

The anomaly as surveyed on the ground occurs as a complex of four dipoles clustered on an E-W trend. As a group the dipoles appear to be due to sources shallowing to the west and plunging to the SE. A single complex magnetic body could be the source, or a cluster of magnetic bodies.

Preliminary modelling of the western dipole (GR1a) indicates it is due to a shallow body at 20-40m to top of centre. (see Figure 1). Dipoles further east appear to be due to the magnetic body, or bodies, at greater depths but not exceeding 200m to the top.

Detailed appraisal of ground magnetic data will be carried out prior to drill target selection.

6.2. Anomaly GR2

Anomaly GR2 is a single dipole apparently due to a relatively simple magnetic body at 50-100m depth to top and plunging to the SE.

Modelling of the response at its shallowest (western) end, suggests a depth to top of centre of 100m.

Detailed appraisal of ground magnetic data will be carried out prior to drill target selection.

B.E. HARVEY
7. REFERENCES


8. KEYWORDS

Airborne, geophys-mag.

Locality Tennant Creek SE53-14

9. LIST OF PLANS

<table>
<thead>
<tr>
<th>Plan No.</th>
<th>Title</th>
<th>scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTa 420</td>
<td>Gosse River EL 3537 Locality Plan</td>
<td>1:250 000</td>
</tr>
<tr>
<td>NTd 3439</td>
<td>Gosse River Stacked Magnetic Profiles sheet 1</td>
<td>1:50 000</td>
</tr>
<tr>
<td>NTd 3440</td>
<td>&quot; &quot; &quot; &quot; sheet 2</td>
<td>&quot;</td>
</tr>
<tr>
<td>NTd 3441</td>
<td>&quot; &quot; &quot; &quot; sheet 3</td>
<td>&quot;</td>
</tr>
<tr>
<td>NTd 3442</td>
<td>&quot; &quot; &quot; &quot; sheet 4</td>
<td>&quot;</td>
</tr>
<tr>
<td>NTd 3443</td>
<td>&quot; &quot; &quot; &quot; sheet 5</td>
<td>&quot;</td>
</tr>
<tr>
<td>NTd 3444</td>
<td>&quot; &quot; &quot; &quot; sheet 6</td>
<td>&quot;</td>
</tr>
<tr>
<td>NTd 3445</td>
<td>Gosse River - flight Path Recovery sheet 1</td>
<td>&quot;</td>
</tr>
<tr>
<td>NTd 3446</td>
<td>&quot; &quot; &quot; &quot; sheet 2</td>
<td>&quot;</td>
</tr>
<tr>
<td>NTd 3447</td>
<td>&quot; &quot; &quot; &quot; sheet 3</td>
<td>&quot;</td>
</tr>
<tr>
<td>NTd 3448</td>
<td>&quot; &quot; &quot; &quot; sheet 4</td>
<td>&quot;</td>
</tr>
<tr>
<td>NTd 3449</td>
<td>&quot; &quot; &quot; &quot; sheet 5</td>
<td>&quot;</td>
</tr>
<tr>
<td>NTd 3450</td>
<td>&quot; &quot; &quot; &quot; sheet 6</td>
<td>&quot;</td>
</tr>
<tr>
<td>NTd 3496</td>
<td>Gosse River - Total Magnetic Contours sheet 1</td>
<td>&quot;</td>
</tr>
<tr>
<td>NTd 3497</td>
<td>&quot; &quot; &quot; &quot; sheet 2</td>
<td>&quot;</td>
</tr>
<tr>
<td>NTd 3498</td>
<td>&quot; &quot; &quot; &quot; sheet 3</td>
<td>&quot;</td>
</tr>
<tr>
<td>NTd 3499</td>
<td>&quot; &quot; &quot; &quot; sheet 4</td>
<td>&quot;</td>
</tr>
<tr>
<td>NTd 3500</td>
<td>&quot; &quot; &quot; &quot; sheet 5</td>
<td>&quot;</td>
</tr>
<tr>
<td>NTd 3501</td>
<td>&quot; &quot; &quot; &quot; sheet 6</td>
<td>&quot;</td>
</tr>
<tr>
<td>NTd 3519</td>
<td>Gosse River Aeromagnetic Contours Interpretations</td>
<td>1:00 000</td>
</tr>
</tbody>
</table>
FIGURES

Fig. One:  Gosse River GR1 Line 800mE Ground Mag. Model

Fig. Two:  Gosse River Anomaly GR1 Ground Mag. Contours

Fig. Three: Gosse River Anomaly GR2 Ground Mag. Contours
FIGURE ONE

GOSSE RIVER Anom. GR1a Gnd. Mag. LINE 800mE MODEL
Susc. = .012es

OBSERVED

CALCULATED

MODEL: GR1a
Centered at 1875m N
Depth to top of centre = 30m
Dip: vert.
Width: 30m

FIGURE ONE
FIGURE TWO
GOSSE RIVER ANOMALY GR1
CONTOURED
GROUND MAGNETICS

Mag.N
Scale 1:8000
Contour Interval 10nT
No diurnal correction
Smoothed data
Spike K = 5
Running array 5-1-1-1-5

1000mN

2400mN

1400mE
2000mE
2500mE
2000mN
FIGURE THREE
GOSSE RIVER ANOMALY GR2
CONToured Ground Magnetics

Contour Interval = 10nT
No diurnal correction
Smoothed data
Spike K = 5
Running array .5-1-1-1-.5
GROUND MAGNETIC PROFILES
GOSSE RIVER GR1 Gnd. Mag. LINE 1100mE

nT

1938 1480 1588 1728 1856 1984 2112 2240 2378 2500 mN
GOSSE RIVER GR1 Grd. Mag. LINE 2000mE

nt

51558
51538
51518
51498
51478
51458
51438
51418
51398
51378
51358
1150 1300 1450 1600 1750 1900 2050 2200 2350 2500

min
GOSSE RIVER GR2 GROUND MAG SURVEY Line 1200mE

nT

210 420 630 840 1050 1260 1470 1680 1890 2100
GOSSE RIVER GR2 GROUND MAG SURVEY Base Line 1500mN
98 BLOCKS
AREA: 121.834 sq. miles
315.56 sq kilometres

1:250,000 SHEET TENNANT CREEK
1:250,000 SHEET ALROY
E.L. LOCATION

C.R.A. EXPLORATION PTY LIMITED
EL 3537
GOSSE RIVER
LOCATION PLAN

Reference: Tennant Ck SE53-14, Alroy SE53-15
Geologist: BEH Scale: 1:250,000 Report No: 12652
Drawn: SRJ/JFC Date: JAN 1982 Plan No: NTA 420