
# GBS GOLD AUSTRALIA PTY LTD

## ANNUAL EXPLORATION REPORT

## EL 24944

## FOR PERIOD ENDING 3 October 2007

## TOWNS RVER, NT

**MOUNT YOUNG: 1:250 000**
**Towns: 1:100 000**

## Titleholders: Terra Gold Mining Pty Ltd

**Distribution:**

1. **DPIFM Darwin NT**
2. **GBS Gold Australia Perth**
3. **Burnside Operations P/L Brocks Creek**
4. **Union Reefs, Pine Creek**

**GBS Report No. MB/TN/07-02**

**Zia U. Bajwah**
**October 2007**

## SUMMARY

EL 24944 is located within McArthur Basin about 600 km south-east of Darwin and forms part of the Towns River group of tenements held by GBS Gold Australia Pty Ltd. Terra Gold Mining Pty Ltd (subsidiary of the GBS Gold Australia Pty Ltd) applied for the EL 24944 on 19 September 2005 and was granted on 4 September 2006 for a period of 6 years, which expires on 3 September 2012.

EL 24944 lies on the eastern part of the McArthur Basin, mainly on the western side of the Batten Trough, within the Bauhinia Shelf. Sediments of the Roper Group cover most of the tenement with sporadic outcrops of Nathan Group, McArthur Group and Tawallah Group sediments.

A technical review of the previous work has been carried out in order to assess the prospectivity of the project area. Work completed during the reporting period included, technical review of the tenement, planning for up-coming field season, report writing and tenement management activities.

Planned exploration for EL 24944 will involve ongoing technical review of additional data acquired and follow up of the Towns River Project area, including the other two tenements. Work will also involve ground-truthing, checking areas of anomalism/prospectivity, geophysical survey, geochemical sampling and some exploratory RAB/RC drilling in areas that are deemed worthy.

**TABLE OF CONTENT**


| | |
|---|---|
| SUMMARY | 2 |
| 1.0 INTRODUCTION | 4 |
| 2.0 LOCATION AND ACCESS | 4 |
| 3.0 TENEMENT STATUS AND OWNERSHIP | 4 |
| 4.0 GEOLOGICAL SETTING | 6 |
| 4.1 Prospectivity of the Project Area | 9 |
| 5.0 WORK COMPLETED DURING REPORTING PERIOD | 12 |
| 6.0 PROPOSED EXPLORATION PROGRAM FOR 2007-08 | 13 |
| 7.0 REFERENCES | 13 |


## List of Figures


**Figure 1:** EL 24665 and mineral prospect location in the project area
**Figure 2:** Geological Setting of the Project area
**Figure 3**: Indicator mineral sample sites with micro-diamond localities


## List of Appendix


**Appendix 1:** Exploration Expenditure Statement for EL 24665

## 1.0 INTRODUCTION

EL 24944 is located within McArthur Basin about 600 km south-east of Darwin and forms part of the Towns River group of tenements held by GBS Gold Australia Pty Ltd. Well known Merlyn Diamond mine and McArthur River base metal deposits are located about 137 km from the tenements. In this report, exploration activity carried during the reporting period is presented.

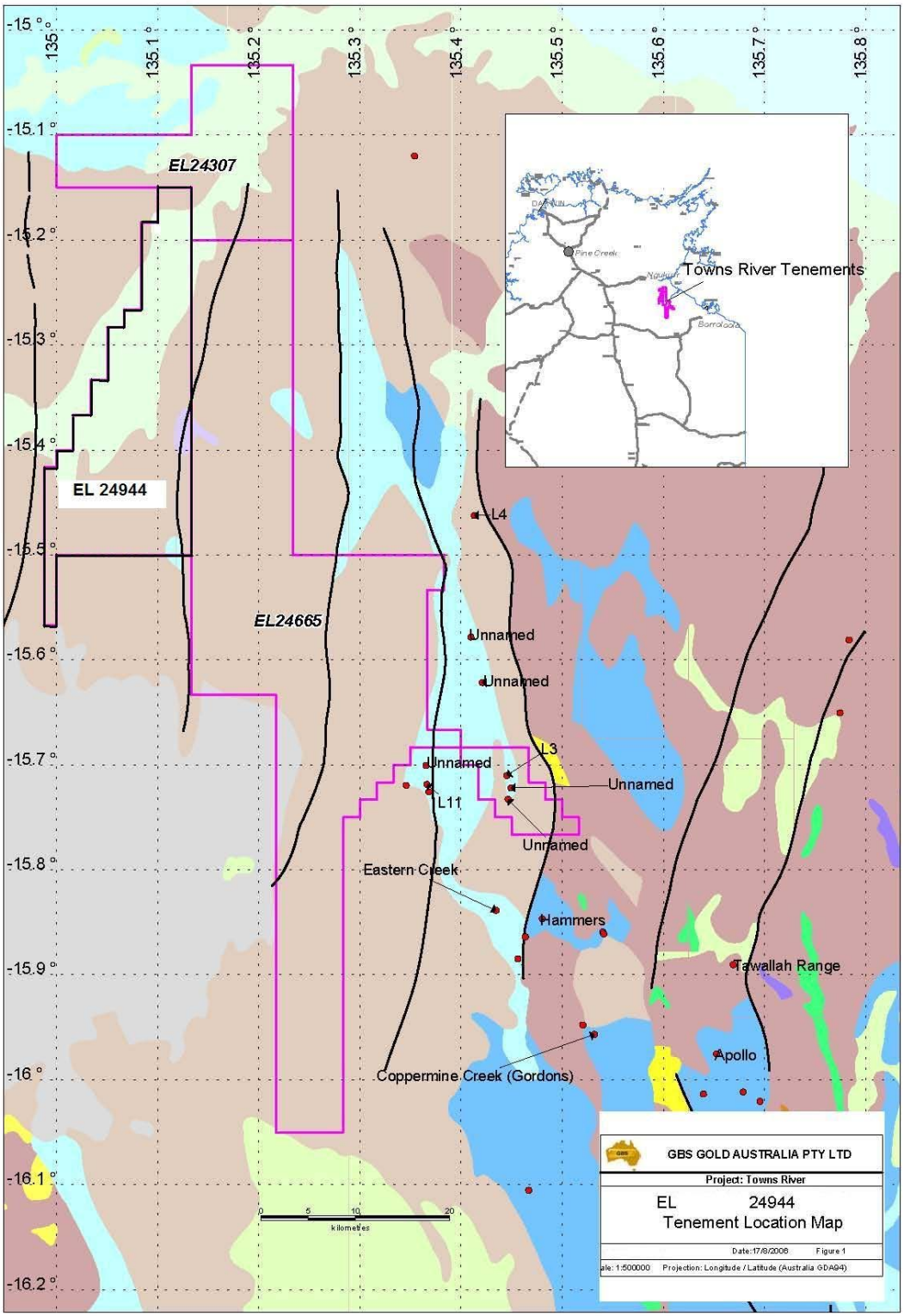
## 2.0 LOCATION AND ACCESS

EL 24944 is located about 127 km NW of Borroloola (Figure 1), a main settlement in the McArthur Basin, and about 136 km west of Gulf of Carpentaria. The main access is via Carpentaria Highway which is connected with the Stuart Highway about 235 km south of Katherine. Topography within the tenement varies with undulating plains, ridges and mesas. Within the tenement access may be achieved by four wheel drive vehicles, and in some cases access may only be possible by helicopter. However, during the monsoon rainy season, area may be inundated with heavy rainfall which may make access impossible, particularly during December to March.

## 3.0 TENEMENT STATUS AND OWNERSHIP

Terra Gold Mining Pty Ltd (100%) applied for the EL 24944 on 19 September 2005 and was granted on 4 September 2006 for a period of 6 years which expires on 3 September 2012. EL 24944 covers an area of 121 blocks (392.3 $km^2$). Terra Gold Mining Pty Ltd is a subsidiary of the GBS Gold Australia Pty Ltd. Adjacent tenements such as EL 24307, EL 24944 (Figure 1) are also explored by the company which are owned by Terra Gold Mining. All these tenements form Towns River project. Underlying cadastre belongs to Northern Territory Land Corporation with Pastoral Lease No 756.

**Figure 1: EL 24944 and mineral prospects location in the project area**



## 4.0 GEOLOGICAL SETTING

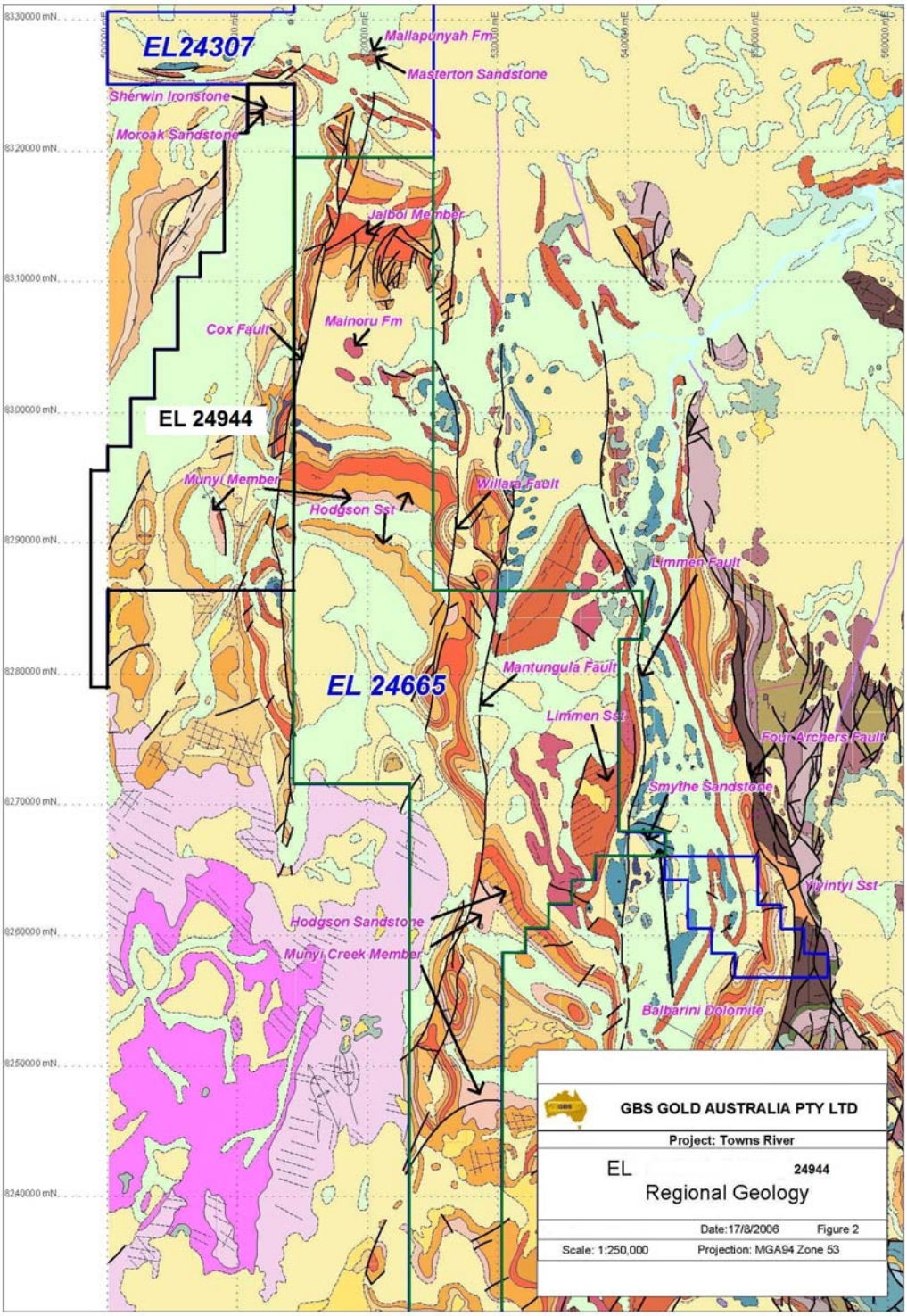
EL 24944 lies on the eastern part of the McArthur Basin, mainly on the western side of the Batten Trough, within the Bauhinia Shelf. A few eastern blocks of EL 24944 are also within the Batten Fault Zone trough, which contains the thickest part of the McArthur Group sediments. Geological notes on the region have mainly been derived from Haines et al. 1993, with some information from Ferenczi, 2001. Sediments from the Roper Group cover most of the tenement (Figure 2), with sporadic outcrops of Nathan Group, McArthur Group and Tawallah Group sediments. The Palaeoproterozoic sediments of the Tawallah Group are the oldest sediments within the tenements, followed by the McArthur Group sediments.

Small isolated outcrops of Masterton Sandstone are in contact with Mallapunyah Formation sediments, mapped within EL 24944 (Figure 2). The Masterton Sandstone has been divided into 4 stratigraphic units, and it is likely that from descriptions that the third unit is present outside EL 24944. The third unit is characterised as being ‘thin-bedded quartz arenites with some silicified carbonates, and ferruginous in places’ (Haines et al. 1993). Ferruginous redbeds with hematitic pisoliths have been recorded.

The Mallapunyah Unit is a redbed unit of mudstones, siltstones, dolostones and sandstones with pseudomorphs after halite and gypsum. Most outcrops are strongly leached and silicified. It conformably overlies the Masterton Formation, and so would probably be the lower portion of Mallapunyah Formation. because it abuts Masterton Formation (?). The lower part of the Mallapunyah Formation is shale, siltstone and sandstone-dominant, and may be ferruginous in places.

Two units of the Nathan Group are found as sparse sporadic mapped outcrops within EL 24944. Most of the occurrences of the Nathan Group are mapped on the eastern side of the tenement. The lower Smythe Sandstone is a conglomeritic sandstone unit; poorly sorted, massive, with coarse polymictic conglomerate indicative of a high energy transgressive facies. It grades into the dolostones of the overlying Balbarini Dolomite.

**Figure 2: Geological Setting of the Project Area**



The Balbarini Dolomite is a sequence of silicified dolostones and dolomitic sandstones. Most outcrops have undergone extensive silicification, with low outcrops of ooid, microbial laminated and stromatolitic chert, and fine-grained leached sandstones (probably originally dolomitic) are common. Containing elevated base metal values and presence of barite makes this unit prospective for base metal mineralisation. Notable outcrops of Balbarini Dolomite are mapped in the eastern and northern part of EL 24665 which are in faulted contact with undifferentiated Abner Sandstone. Most of the sediments within the tenement belong to the Roper Group, which is younger than the Tawallah, McArthur and Nathan Groups. The Mainoru Formation conformably overlies the Limmen Sandstone, and is a thin-bedded micaceous mudstone, with intermittent beds of fine-grained sandstone. It coarsens upwards into the Crawford Formation, which is a unit of sandstone with alternating siltstone, with prominent glauconite within the sandstone.

Perhaps the most extensive unit within the tenement is the Sherwin Iron Stone Member together with Moroak Sandstone Member of the Roper Group. The Sherwin Iron Stone Member is mainly ferruginous sandstone with beds of sandy iron stone and hematitic shale interbedded with micaceous sandstone and mudstone. The Moroak Member is represented by fine-grained sandstone which may be ferruginous at places.

The eastern part of the project area is intersected by NW-trending Cox Fault (Figure 2). Several suites of mafic dykes and sills intrude into the Proterozoic sediments within the MOUNT YOUNG 250,000 Geology Sheet, and have been mapped along the Cox Fault. In the adjacent 250,000 Geology Sheet, breccia pipes of micaceous peridotite similar to kimberlite in composition intrude the Bukalara Sandstone and have been dated at 360Ma. It is possible that simlar-aged intrusives may extend into the project area. Considerable movement along the Cox and other faults present in the project is responsible for both folding in the Roper Group and juxtaposition against older stratigraphic units. The north-trending faults display strike slip movement, with right lateral displacement noted by Haines et al (1993).

## 4.1 Prospectivity of the Project area

GBS Gold Australia has at least three contiguous exploration licences (Figure 3) which form Towns River project and therefore, prospectivity of these tenements with special reference to EL 24944, is discussed below.

There are 3 mineral occurrences in the eastern blocks of EL 24665 (Figure 1); 2 unnamed occurrences of barite within the Balbarini Dolomite, and L3. The L3 occurrence (Marlow 1963) is an iron occurrence of lenticular bodies 0.3m – 3m wide and 6 – 9m in length, grading 20% - 30% Fe. The mineralisation occurs in breccia pods, with 'beds above and below visibly barren'. However, it may be a surficial Fe deposit along the unconformable contact between the Balbarini Dolomite and Limmen Sandstone. Outside the Towns River project tenements (but in the same stratigraphy) other mineral occurrences include;

a) Eastern Creek and L11 (Figure 1) are carbonate Pb-Zn-Cu prospects within the Balbarini Dolomite, comprising galena with lesser chalcopyrite and malachite in veins and fracture fill within dolostone and silicified dolostone.

b) The Balbarini Dolomite also hosts some unnamed stratabound Cu and Pb occurrences between L3 and L4 (Figure 1).

c) L4 is a stratabound manganese occurrence, possibly hosted in the Cretaceous Walker River Formation. The manganese (pyrolusite) occurs as several lenticular bodies 15cm – 1m wide, and 3 - 6m long within siltstone, and grading 20% - 40% Mn.

*Diamond Indicator Minerals*

An examination of the NTGS Diamond Indicator Mineral (DIM) Database shows 115 samples collected within the Towns River Project. Approximately 70 samples were collected by CRA exploration in 1985, with around 35 samples collected by Ashton Mining in 1996 (Figure 3). Samples were collected using (helicopter) reconnaissance drainage gravel sampling, and sieved to -2mm in the field, then processed for kimberlitic indicator minerals, and diamonds. Amongst these, 5 samples had any minerals; all had 1 micro-diamond each; 2 samples in **EL 24944**, and 3 in EL 24665 as shown in Figure 3.

Technical review presented above shows that **EL 24944** and other tenements in the Towns River project have potential in base metals, iron ore, manganese and diamonds. Figure 1 shows that EL 24665 contains at least three known base metal occurrence L3 and two unnamed) which occurs within Bilbarini Dolomite. Further southeast of the tenement, a number of base metal occurrences are located within Bilbarini Dolomite, indicating significant potential for base metal mineralisation. For this purpose, a detailed soil geochemical and EM survey can help to locate base metal anomalies and conductor present at depth.

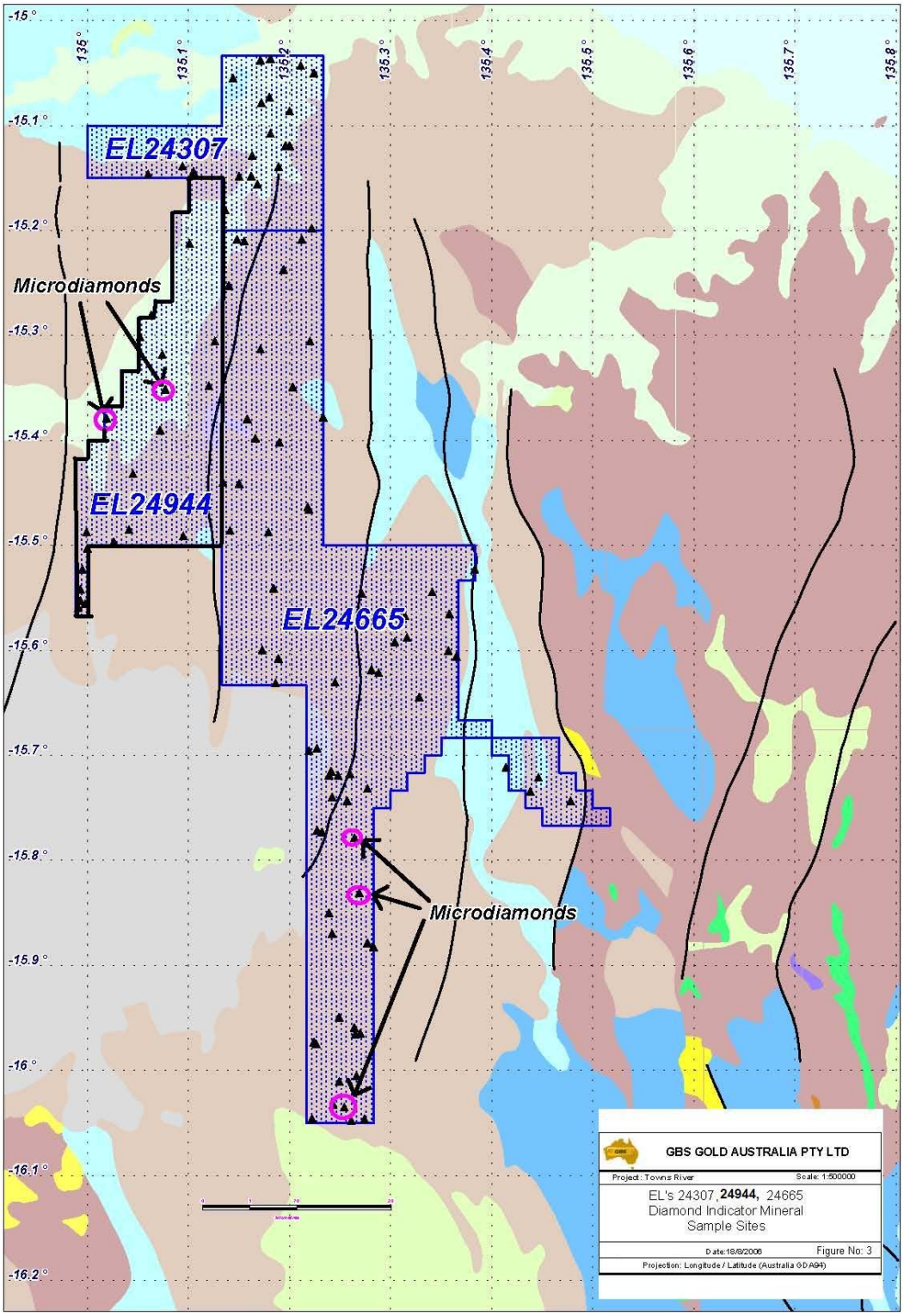
West of the project area, the Sherwin Creek Member of the McMinn Creek Formation hosts well known iron ore deposits, which contain a resource of over 150 Mt. Presence of similar lithologies within **EL 24944** together with the iron ore mineralisation suggests that this area could host iron ore mineralisation.

Sedimentary/stratiform (Groote Eylandt style) deposits are hosted in marine Cretaceous sediments that are adjacent to Proterozoic terraces that define a Late Albian (~100Ma) shoreline. Mineralisation ranges from disseminated Mn oxides in clayey quartz arenite to massive bedded pisolitic ore up to 11m in thickness.

Within the project area, the Albian shoreline transects the northern part of EL 24665 and includes EL 24307. BHP carried out airborne EM surveys and RC drilling to test the EM anomalies and mapped Cretaceous sediments for Mn during exploration in the mid-1990's. The Cretaceous/Proterozoic boundary averaged around 40m depth, and logs noted 'ferruginous' along the Cretaceous/Proterozoic contact, but no significant manganese mineralisation was found. The Towns River project area deserve appraisal with new approach. Prospective geological setting is present in the area and systematic exploration may lead to the identification of significant manganese mineralisation.

The McArthur Basin has well-established diamond potential and hosts Merlin Diamond mine which has produced over 500 000 carats of high quality gem stone. In the project area, a number of micro-diamonds have been discovered so far. However, previous

**Figure 3: Indicator mineral sample sites with micro-diamond localities.**



exploration programs have not succeeded to find a new kimberlitic pipe. Perhaps it requires new ideas/approaches. Jacques and Milligan (2004) note that most diamondiferous intrusions show evidence of crustal/regional and local structural controls, which may be highlighted by changes in gravity gradients. At Merlin, the kimberlite pipes coincide with a prominent NE-trending gravity discontinuity that intersects a subordinate N-trending gravity gradient and an inferred extension of the NW-trending Calvert Fault (Bajwah 2007). Within the Towns tenements, there is a change in gravity gradient near the Mantungula Fault in EL 24665. Under the new exploration program, areas along the major fault should be tested with newly developed gravity gradiometer by BHP. A high resolution gravity survey might identify a significant diamond-bearing pipe in the project area.

## 5.0 WORK COMPLETED DURING REPORTING PERIOD

During the reporting year much effort was devoted to re-commissioning of the 2.5 Mt dual gold processing plant at Union Reefs, and generating the inventory base to sustain an economic mine life. As a result of that much technical and human resources were focused in developing Brocks Creek, Rising Tide, Fountain Head and other areas such as Cosmo Deeps and Yam Creek with a budget of several million dollars. EL 24944 is a strategic tenement with regard to future exploration, and expanding company's multi-commodity base. A technical review of the previous work has been carried out in order to assess the prospectivity of the project area. Work completed during the reporting period included:

- Technical review of the tenement
- Planning for up-coming field season
- Report writing and tenement management activities.

This exploration activity costed $11664.00 during the year 2006-07 and details are given in appendix 1.

## 6.0 PROPOSED EXPLORATION PROGRAM FOR 2007-08

Planned exploration for EL 24944 will involve ongoing technical review of additional data acquired and follow up of the Towns River Project area, including the other two tenements.

Work will also involve ground-truthing, checking of areas of anomalism/prospectivity, geophysical survey, geochemical sampling and some exploratory RAB/RC drilling in areas that are deemed worthy. The basic model for exploration within the tenement will be to investigate areas that contain prospective stratigraphy similar to that iron ore mineralisation located at Roper River or McArthur River base metal deposits in the hope of finding a repetition of this type of mineralisation. Areas such as in the vicinity of north-south trending Cox Fault will be checked out thoroughly for mineralisation.

## 7.0 REFERENCES


Ashton, 1993. Annual Report EL7260, 7261, 7262, 7263, 7264, 7341 and 7824. 24th May, 1992 to 23rd June 1993 (unpubl); *Northern Territory Geological Survey Company Report CR1993-0632.*

Bajwah, Z. U., 2007. Annual exploration report on EL 24665 for period ending 27 April 2007, Towns River, *NT. GBS Gold Australia Pty Ltd.*

Ferenczi, PA., 2001. Iron ore, manganese and bauxite deposits of the Northern Territory. *Northern Territory Geological Survey, Report* 13.

Haines, PW., Pietsch, BA., Rawlings, DJ., and Madigan, TL., 1993. 1:250,000 Geological Map Series Explanatory Notes MOUNT YOUNG SD53-15. *Northern Territory Department of Mines and Energy, Northern Territory Geological Survey*.

Jacques, AL., and Milligan, PR., 2004. Patterns and controls on the distribution of diamondiferous intrusions in Australia. *Lithos Vol 77 pages 783 – 802*.

Johnstone, WH., 1974. EL748 Tawallah Range and Eastern Creek Lead Prospect, Final Report (unpubl); *Northern Territory Geological Survey Company Report CR1974-0067.*

Marlow 1963. Exploration in the Carpentaria area during 1962 (unpubl); *Northern Territory Geological Survey Company Report CR1963-0004.*

# APPENDIX 1

| NORTHERN TERRITORY EXPLORATION EXPENDITURE FOR MINERAL TENEMENT |
|---|

| ***Section 1. Tenement type, number and operation name: (One licence only per form even if combined reporting has been approved)*** | |
|---|---|
| **Type** | *EXPLORATION LICENCE* |
| **Number** | *24944* |
| **Operation Name (optional)** | *TOWNS RIVER* |

| ***Section 2. Period covered by this return:*** | | | |
|---|---|---|---|
| **Twelve-month period:** | | **If Final Report:** | |
| From | *4 October 2006* | From | |
| To | *3 October April 2007* | To | |
| Covenant for the reporting period: | | $**40000.00** | |

| ***Section 3. Give title of accompanying technical report:*** | |
|---|---|
| Title of Technical Report | ANNUAL EXPLORATION REPORT, EL 24944 FOR PERIOD ENDING 3 OCTOBER 2007, TOWNS RVER NT |
| Author | ZIA U. BAJWAH |

| ***Section 4. Locality of operation:*** | |
|---|---|
| Geological Province<br>Geographic Location | ***McArthur Basin***<br>***Towns River*** |

| ***Section 5. Work program for the next twelve months:*** | | | |
|---|---|---|---|
| **Activities proposed** (please mark with an "X"): | | [X] | Drilling and/or costeaning |
| [X] | Literature review | [X] | Airborne geophysics |
| [X] | Geological mapping | [ ] | Ground geophysics |
| [X] | Rock/soil/stream sediment sampling | [ ] | Other: |
| **Estimated Cost**: | | $**30000.00** | |

***Section 6. Summary of operations and expenditure:***

Please include salaries, wages, consultants fees, field expenses, fuel and transport, administration and overheads under the appropriate headings below. Mark the work done for the appropriate subsections with an "X" or similar, except where indicated. Complete the right-hand columns to indicate the data supplied with the Technical Report.

**Do not include the following as expenditure (if relevant, these may be**

- Insurance
- Company Prospectus
- Rent & DepartmentFees
- Bond
- Transfer costs
- Title Search
- Legal costs
- Advertising
- Land Access Compensation
- Meetings with Land Councils
- Payments to Traditional Owners
- Fines

| Exploration Work type | Work Done (mark with an "X" or provide details) | | Expenditure | Data and Format Supplied in the Technical Report | |
|---|---|---|---|---|---|
| | | | | Digital | Hard copy |
| **Office Studies** | | | | | |
| Literature search | **X** | | 2155.00 | | |
| Database compilation | **X** | | 1230.00 | | |
| Computer modelling | | | | | |
| Reprocessing of data | | | | | |
| General research | **X** | | 5842.00 | **x** | |
| Report preparation | **X** | | 2200.00 | **x** | |
| Other (specify) Admin | | | 237.00 | | |
| | **Subtotal** | | $11664.00 | | |
| **Airborne Exploration Surveys (state line kms)** | | | | | |
| Aeromagnetics | | kms | | | |
| Radiometrics | | kms | | | |
| Electromagnetics | | kms | | | |
| Gravity | | kms | | | |
| Digital terrain modelling | | kms | | | |
| Other (specify) | | kms | | | |
| | **Subtotal** | | $ | | |
| **Remote Sensing** | | | | | |
| Aerial photography | | | | | |
| LANDSAT | | | | | |
| SPOT | | | | | |
| MSS | | | | | |
| Other (specify) | | | | | |
| | **Subtotal** | | $ | | |
| **Ground Exploration Surveys** | | | | | |
| ***Geological Mapping*** | | | | | |
| Regional | | | | | |
| Reconnaissance | | | | | |
| Prospect | | | | | |
| Underground | | | | | |
| Costean | | | | | |
| ***Ground Geophysics*** | | | | | |
| Radiometrics | | | | | |
| Magnetics | | | | | |
| Gravity | | | | | |
| Digital terrain modelling | | | | | |

| Exploration Work type | Work Done (mark with an "X" or provide details) | Expenditure | Data and Format Supplied in the Technical Report | |
|---|---|---|---|---|
| | | | Digital | Hard copy |
| Electromagnetics | | | | |
| SP/AP/EP | | | | |
| IP | | | | |
| AMT/CSAMT | | | | |
| Resistivity | | | | |
| Complex resistivity | | | | |
| Seismic reflection | | | | |
| Seismic refraction | | | | |
| Well logging | | | | |
| Geophysical interpretation | | | | |
| Petrophysics | | | | |
| Other (specify) | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Geochemical Surveying and Geochronology*** ***(state number of samples)*** | | | | | | | |
| Drill (cuttings, core, etc.) | | | | | | | |
| Stream sediment | | | | | | | |
| Soil | | | | | | | |
| Rock chip | | | | | | | |
| Laterite | | | | | | | |
| Water | | | | | | | |
| Biogeochemistry | | | | | | | |
| Isotope | | | | | | | |
| Whole rock | | | | | | | |
| Mineral analysis | | | | | | | |
| Laboratory analysis (type) | | | | | | | |
| Petrology | | | | | | | |
| Other (specify) | | | | | | | |
| **Ground Exploration Subtotal** | | | | | $ | | |
| **Drilling (state number of holes & metres)** | | | | | | | |
| Diamond | | holes | | metres | | | |
| Reverse circulation (RC) | | holes | | metres | | | |
| Rotary air blast (RAB) | | holes | | metres | | | |
| Air-core | | holes | | metres | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Auger | | holes | | metres | | | |
| Other (specify) | | holes | | metres | | | |
| | **Subtotal** | | | | $ | | |
| **Other Operations** | | | | | | | |
| Costeaning/Trenching | | | | | | | |
| Bulk sampling | | | | | | | |
| Mill process testing | | | | | | | |
| Ore reserve estimation | | | | | | | |
| Underground development (describe) | | | | | | | |
| Mineral processing | | | | | | | |
| Other (specify) | | | | | | | |
| | **Subtotal** | | | | $ | | |
| **Access and Rehabilitation** | | | | | | | |
| Track maintenance | | | | | | | |
| Rehabilitation | | | | | | | |
| Monitoring | | | | | | | |
| Other (specify) | | | | | | | |
| | **Subtotal** | | | | $ | | |
| **TOTAL EXPENDITURE** | | | | | **$11664.00** | | |

| ***Section 7. Comments on your exploration activities:*** |
|---|
| |

I certify that the information contained herein, is a true statement of the operations carried out and the monies expended on the above mentioned tenement during the period specified as required under the *Northern Territory Mining Act* and the Regulations thereunder.

☐ I have attached the Technical Report

| | |
|---|---|
| 1. Name: Zia U. Bajwah | 2. Name: |
| Position: Geologist | Position: |
| Signature: | Signature: |
| Date: 03/10/2007 | Date: |