TENNANT CREEK
EXPLORATION LICENCE 27580

ANNUAL EXPLORATION REPORT
YEAR ENDED 3 MARCH 2011

Submitted by: Vale Exploration Pty Ltd
Date: July 2011
Distribution: NT Department of Resources, Darwin
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Executive Summary

Exploration Licence 27580, Tennant Creek project, is being explored for phosphate.

Work completed during the first year of tenure ended 3 March 2011 included an open file literature review and data compilation and review of publicly available geological maps, AAPA Register inspection and Authority Certificate, acquisition of NRETAS environmental data and compilation of a Mining Management Plan.

Work proposed during the 2011 field season includes geological mapping, rock chip sampling, RC drilling and analysis of rock chip and drill samples.
1 INTRODUCTION

1.1 Location and Access

Exploration Licence 27580 is located approximately 28 km ENE of Tennant Creek township on the Tennant Creek (SE53-14) 1:250,000 and the Barkly 5859, Flynn 5759, Gosse River 5858 and Tennant Creek 5758 1:100,000 map sheets.

The tenement occurs within Tennant Creek Station (NT Portions 494 and 1075, NT Por 1075, PPL 1142).

Access to EL27580 can be gained by travelling 12km north along the Stuart Highway, (to 500m north of the Tennant Creek Telegraph Station) then turning east and travelling approximately 25km east along unsealed roads into the tenement.

Alternative access can be gained by travelling (from Tennant Creek) 23km north along the Stuart Highway then approximately 29km east along the sealed Barkly Highway, to the microwave tower. From there, the northwest corner of EL27580 may be accessed by travelling 3km south along station and bore tracks, into the tenement.

1.2 Tenement Details

ELs 27580, 27712 and 27992 comprise Vale’s Tennant Creek project. Tenement details are provided below.

Table 1: Tennant Creek Project Tenement Details

<table>
<thead>
<tr>
<th>Licence Number</th>
<th>Holder</th>
<th>Blocks</th>
<th>Date of Grant</th>
<th>Date of Expiry</th>
</tr>
</thead>
<tbody>
<tr>
<td>EL 27580</td>
<td>Vale Australia EA Pty Ltd</td>
<td>108</td>
<td>04/03/2010</td>
<td>03/03/2016</td>
</tr>
<tr>
<td>EL 27712</td>
<td>Vale Australia EA Pty Ltd</td>
<td>51</td>
<td>08/07/2010</td>
<td>07/07/2016</td>
</tr>
<tr>
<td>EL 27992</td>
<td>Vale Australia EA Pty Ltd</td>
<td>89</td>
<td>26/10/2010</td>
<td>25/10/2016</td>
</tr>
</tbody>
</table>

Group Technical Reporting status (GR181/11, Tennant Creek) was approved on 27 January 2011.

A location map is provided in Figure 1 below.

1.3 Native Title

EL 27580 covers pastoral lease land and falls within the authority of the Central Land Council.

There are no registered Native Title claims over EL 27580.
Figure 1: Tenement Location Plan
1.4 Climate and Hydrology

The region is semi-arid with annual rainfall of 452.9 mm. The climate is characterized by distinct wet and dry seasons with the majority of rain falling between November and March. The predominant wind direction is from the east. Drainage in the project is dominated by the Gosse River which transects the project in a NE / SW direction.

Table 2: Climate Statistics – Tennant Creek Airport (BOM 2011)

<table>
<thead>
<tr>
<th></th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean Max Temp °C</strong></td>
<td>36.7</td>
<td>35.7</td>
<td>34.4</td>
<td>31.7</td>
<td>27.6</td>
<td>24.5</td>
<td>24.6</td>
<td>27.5</td>
<td>31.6</td>
<td>34.7</td>
<td>36.4</td>
<td>37.2</td>
</tr>
<tr>
<td><strong>Highest Temp °C</strong></td>
<td>44.0</td>
<td>44.5</td>
<td>40.7</td>
<td>38.4</td>
<td>36.4</td>
<td>33.6</td>
<td>34.7</td>
<td>35.7</td>
<td>38.9</td>
<td>41.6</td>
<td>43.4</td>
<td>45.4</td>
</tr>
<tr>
<td><strong>Mean days ≥ 40 °C</strong></td>
<td>5.9</td>
<td>2.7</td>
<td>0.3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.8</td>
<td>3.5</td>
<td>6.1</td>
<td></td>
</tr>
<tr>
<td><strong>Mean Minimum Temp °C</strong></td>
<td>24.9</td>
<td>24.5</td>
<td>23.2</td>
<td>20.4</td>
<td>16.4</td>
<td>12.9</td>
<td>12.3</td>
<td>14.5</td>
<td>18.4</td>
<td>21.7</td>
<td>23.8</td>
<td>24.9</td>
</tr>
<tr>
<td><strong>Lowest Temp °C</strong></td>
<td>17.2</td>
<td>17.2</td>
<td>14.6</td>
<td>11.6</td>
<td>6.7</td>
<td>5.3</td>
<td>4.5</td>
<td>6.0</td>
<td>7.4</td>
<td>11.6</td>
<td>10.7</td>
<td>15.7</td>
</tr>
<tr>
<td><strong>Mean Rainfall (mm)</strong></td>
<td>114.1</td>
<td>122.4</td>
<td>53.3</td>
<td>16.2</td>
<td>8.6</td>
<td>5.3</td>
<td>5.1</td>
<td>1.6</td>
<td>8.0</td>
<td>19.9</td>
<td>38.5</td>
<td>68.2</td>
</tr>
<tr>
<td><strong>Mean no. of days of rain</strong></td>
<td>10.0</td>
<td>9.2</td>
<td>5.9</td>
<td>1.9</td>
<td>1.6</td>
<td>0.8</td>
<td>0.7</td>
<td>0.7</td>
<td>1.9</td>
<td>3.9</td>
<td>5.7</td>
<td>7.5</td>
</tr>
</tbody>
</table>

Note: All rainfall and temperature measurements from 1969-2010 (data from 41 years)

1.5 Flora and Fauna

On a regional scale, the project occurs within the Davenport Murchison Ranges (DMR) bioregion. Vegetation includes hummock grasslands and low open woodlands dominated by *Eucalyptus* and *Acacia* species (Baker et al., 2005).

The dominant vegetation community within the project area is *Corymbia* low open woodland. Small areas of Eucalypt low open woodland also occur within the project.

NRETA’s weeds officer in Tennant Creek has advised that introduced flora (weed) species that may occur within the Tennant Creek project area include:

Table 3: Introduced Flora (Weeds)

<table>
<thead>
<tr>
<th>Species Name</th>
<th>Generic Name</th>
<th>Where</th>
<th>Type of Presence</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Calotropis procera</em></td>
<td>Rubber bush</td>
<td>Tennant Creek</td>
<td>unknown</td>
</tr>
<tr>
<td><em>Parkinsonia aculeata</em></td>
<td>Parkinsonia</td>
<td>Tennant Creek</td>
<td>unknown</td>
</tr>
</tbody>
</table>

A search of NRETAS (NT Department of Natural Resources, Environment, the Arts and Sport) data found that no flora species covered by the *EPBC Act 1999* (Environmental Protection and Biodiversity Conservation Act 1999) have been documented within the Tennant Creek Project; however there is minimal data to draw upon with just one flora specimen recorded as having been collected from within the tenement area (NRETAS, 2009b).
Figure 2 produced with Digital Vegetation Mapping data purchased from NRETAS October 2009. Scale 1:750000.
A search of the Australian Government Department of the environment, water, heritage and the areas website, ‘Protected Matters Search Tool’ identified 3 threatened species (one of which is a migratory bird) and 7 migratory bird species (one of which is threatened) within a rectangular search area encompassing the tenements. Although these species may also occur within the tenements, birds listed as migratory or marine are most likely to be located the vicinity of the Gosse River, which bisects the project area.

- **Table 4: Threatened Fauna Possibly Occurring in Tennant Creek Project Area**

<table>
<thead>
<tr>
<th>Species Name</th>
<th>Generic Name</th>
<th>Status</th>
<th>Type of Presence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Birds</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rostratula australis</td>
<td>Australian Painted Snipe</td>
<td>Vulnerable</td>
<td>Species or species habitat may occur within the area</td>
</tr>
<tr>
<td>Macrotis lagotis</td>
<td>Greater Bilby</td>
<td>Vulnerable</td>
<td>Species or species habitat likely to occur within area</td>
</tr>
<tr>
<td>Notoryctes typhlops</td>
<td>Southern Marsupial Mole</td>
<td>Endangered</td>
<td>Species or species habitat likely to occur within area</td>
</tr>
</tbody>
</table>

(Protected Matters Search Tool, 2010)

The Australia Bustard (*Ardeotis australis*) has been recorded near to the project: to the north, east and west (see Figure 3). This species is not considered to be vulnerable, endangered or critically endangered under the *EPBC Act*, but is considered vulnerable by the NT Government and is protected by the *Territory Parks and Wildlife Conservation Act 2009*. The bird is highly mobile and nomadic, and so is unlikely to be affected by the current proposed exploration programme (NRETAS 2011b).

The Southern Marsupial Mole (*Notoryctes typhlops*) is considered endangered under federal law (*EPBC Act*) but is considered vulnerable by the NT Government (*Territory Parks and Wildlife Conservation Act 2009*). The habitat of the mole is typically beneath dunes, sandy plains and river flats (NRETAS 2011c), and is therefore not the vegetation type described as typical for the Tennant Creek Project area. There is conflicting information on the population size of the animal, and it may be reasonably common but infrequently observed (Dept SEWP&C 2011).

The NRETAS search also indicated that the Greater Bilby may occur on the Tennant Creek site. The Bilby may occur on sandy soils and hummock grasslands covered by spinifex, which does not occur in the project area (NRETA 2011a). Indeed, the territory data search did not indicate the likely presence of either the Southern Marsupial Mole or Greater Bilby on the project area (refer Figure 3).

Feral animals that may occur within the project area include:
- Black Rat (*Rattus rattus*)
- Camels (*Camelus dromedarius*)
- Cat (*Felis catus*)
- Donkey (*Equus asinus*)
- Fox (*Vulpes vulpes*)
- Horse (*Equus caballus*).
### Table 5: Marine and Migratory Bird Species

<table>
<thead>
<tr>
<th>Terrestrial/ Marine/ Wetland</th>
<th>Species Name</th>
<th>Generic Name</th>
<th>Status</th>
<th>Type of Presence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migratory Terrestrial Species</td>
<td>Merops ornatus</td>
<td>Rainbow bee-eater</td>
<td>Listed overfly Marine area; Migratory: JAMBA</td>
<td>Species or species habitat may occur within the area</td>
</tr>
</tbody>
</table>
| Migratory Wetland & Marine Species | Ardea alba (CAMBA & JAMBA as Egretta alba) | Great Egret, White Egret | Listed overfly Marine area; Migratory: CAMBA, JAMBA | Species or species habitat may occur within the area |}
| Migratory Wetland & Marine Species | Ardea ibis (CAMBA as Ardeola ibis, JAMBA as Bubulcus ibis) | Cattle Egret | Listed overfly Marine area, Migratory: CAMBA, JAMBA | Species or species habitat may occur within the area |
| Migratory Wetland Species | Charadrius veredus                               | Oriental Plover, Oriental Dotterel | Listed overfly Marine area, Migratory: Bonn A2H, JAMBA, ROKAMBA | Foraging, feeding or related behaviour may occur within the area |
| Migratory Wetland Species | Glareola maldivarum                             | Oriental Pratincole    | Listed overfly Marine area, Migratory: CAMBA, JAMBA, ROKAMBA | Species or species habitat may occur within the area |
| Migratory Wetland Species | Rostratula australis / Rostratula benghalensis s. lat. | Painted Snipe | Listed overfly Marine area, Migratory: CAMBA | Species or species habitat may occur within the area |
| Migratory Marine Birds | Apus pacificus                                   | Fork-tailed Swift      | Listed overfly Marine area, Migratory: CAMBA, JAMBA, ROKAMBA | Species or species habitat may occur within the area |

(Department of Environment, Water, Heritage and Arts, 2011)

JAMBA - Japan-Australia Migratory Bird Agreement 1974  
CAMBA - China-Australia Migratory Bird Agreement 1986  
BONN - Bonn Convention  
ROKAMBA - Republic of Korea – Australia Migratory Bird Agreement
Figure 3: Fauna Plan

Data Supplied by HRETA

VALE EXPLORATION PTY LTD
Tennant Creek - Threatened Fauna

Prepared: EB
Date: 10.03.2011
Map Scale: 1:750,000

GDA 94 MGA 253
1.6 **Historical, Aboriginal, Heritage Sites**

There are no registered Native title claims over the three tenements of the Tennant Creek Project.

No sites of historical significance are listed on the Australian Heritage database.

An inspection of the Aboriginal Areas Protection Authority (AAPA) Register was conducted on 9 September 2009 (over EL27580), and a subsequent inspection was conducted on 18 February 2011 (over EL27580, EL27712 and EL27992). These inspections identified two recorded sites centroid within the project area.

The AAPA register summarized the sites as relating to a river bank and an ephemeral water hole.

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### 2 GEOLOGY

#### 2.1 Regional Geology

The regional geology of the project is dominated by the north trending, structurally complex Palaeoproterozoic Tennant Creek Inlier. The Tennant Creek Inlier contains the Warramunga Formation, a formation consisting of volcanic, volcanoclastics and sedimentary types and is the host of the ‘Tennant Creek-type’ iron oxide copper gold (IOCG) type mineralisation. The Tennant Creek Inlier is also occupied by granitic intrusives.

Cambrian rocks consisting of carbonate, arenaceous and argillaceous types occupy two sedimentary basins (Wiso and Georgina) to the west and east respectively of the Tennant Creek Inlier (refer Figure 4).

#### 2.2 Project Geology

Project geology on EL 27580 consists of common Cambrian age carbonate rocks with siltstone/sandstone units (interpreted to belong to the Gum Ridge Formation). Over 80% of the tenement is covered by sand/gravel (Cainozoic/Quaternary).

Field reconnaissance has revealed some areas of undulating terrain with calcrete/conglomerate/chert scree and subcrop.
3 PREVIOUS EXPLORATION

The Tennant Creek area has been explored by a number of previous explorers who focused their efforts on exploration for either diamonds or Tennant Creek style iron ore copper/gold deposits.

Numerous drill holes are known to occur within EL 27580 including one diamond drill hole, two aircore holes and five drill holes that are unspecified.

A summary of historic tenements and open file reports covering the Tennant Creek Project (including EL 27580) is listed in Table 7. A summary of Previous Exploration works on the Tennant Creek Project is included Table 8. This table collates historic exploration as outlined in open file mineral exploration reports.
<table>
<thead>
<tr>
<th>Tenement</th>
<th>Granted</th>
<th>Ceased</th>
<th>Company</th>
<th>Commodity</th>
<th>Number of Reports</th>
<th>Open File Report Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>EL64</td>
<td>17/07/1972</td>
<td>16/07/1973</td>
<td>Kewanee Australia Pty Ltd</td>
<td>Cu, Pb, Zn, Ni, Co, Bi, Mo, Ag, Au</td>
<td>1</td>
<td>CR1973-0177</td>
</tr>
<tr>
<td>EL97</td>
<td>29/05/1972</td>
<td>28/05/1973</td>
<td>Noblex, Australian Development</td>
<td>Cu, Bi, Pb, Zn, Mo</td>
<td>3</td>
<td>CR1973-0189, CR1975-0066, CR1975-0013,</td>
</tr>
<tr>
<td>EL1573</td>
<td>31/03/1977</td>
<td>01/10/1979</td>
<td>McMahon, KH / Energy Partners</td>
<td>-</td>
<td>1</td>
<td>CR1979-0132</td>
</tr>
<tr>
<td>EL2649</td>
<td>17/06/1980</td>
<td>03/12/1981</td>
<td>CRA Exploration</td>
<td>Au, As, Cu, Pb, Zn, Ag, Bi, Co</td>
<td>1</td>
<td>CR1982-0033</td>
</tr>
<tr>
<td>EL6376</td>
<td>08/02/1989</td>
<td>07/02/1991</td>
<td>Individual: G.S. Remfrey</td>
<td>Au</td>
<td>1</td>
<td>CR1990-0320</td>
</tr>
<tr>
<td>EL22230</td>
<td>19/10/2001</td>
<td>18/10/2002</td>
<td>Giants Reef Mining</td>
<td>Au, Cu, Bi</td>
<td>1</td>
<td>CR2002-0335</td>
</tr>
</tbody>
</table>
### Table 7: Previous Exploration

<table>
<thead>
<tr>
<th>Dates</th>
<th>Company</th>
<th>Commodity</th>
<th>Tenement Numbers</th>
<th>Item Number</th>
<th>Work Completed</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>29/05/1972 – 28/05/1973</td>
<td>Nobelex, Australian Development</td>
<td>Cu, Bi, Pb, Zn, Mo, Au, Ag</td>
<td>EL97</td>
<td>CR1973-0189, CR1975-0066, CR1975-0013</td>
<td>Trig Points, TMI Profiles, Ground Mags, Hammer Drilling, Diamond Drilling, Mag Suscept.</td>
<td>Aimed at magnetite bodies similar to those hosting Tennant Creek style Cu/Au deposits, however no Au assays. 13 shallow holes across GR109 anomaly. DDH403(580 feet) to test anomaly GR107 DDH402 (680 feet) to test anomaly GR301 SHDH92 (230 feet hammer hole) to test anomaly GR405 DDH404 (500 feet) to test anomaly GR405 Hole location plans and DDH sections in local grid only. Trig locations and lat/longs in CR1975-0066</td>
</tr>
<tr>
<td>31/03/1977 – 01/10/1979</td>
<td>McMahon, KH / Energy Partners</td>
<td>Au, As, Cu, Pb, Zn, Ag, Bi, Co</td>
<td>EL1573, EL1574</td>
<td>CR1979-0132</td>
<td>Geological Mapping</td>
<td>Photogeological map of EL1573 shows Gum Ridge Formation.</td>
</tr>
</tbody>
</table>

1 NSA = No Significant Assays
<table>
<thead>
<tr>
<th>Dates</th>
<th>Company</th>
<th>Commodity</th>
<th>Tenement Numbers</th>
<th>Item Number</th>
<th>Work Completed</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Report contains bouger contour plan and magnetic contour plan.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15 RAB Holes [SLRB022-SLRB036] for 901m to test geology &amp; geochem targets generated by April 95 program. 300 x 3m composite samples assayed. Oct 1995: 237 vacuum holes for 1823m. Assays considered anomalous &amp; worthy of follow up.</td>
<td></td>
</tr>
</tbody>
</table>
### Dates | Company | Commodity | Tenement Numbers | Item Number | Work Completed | Comments
--- | --- | --- | --- | --- | --- | ---

### AP2380 (Prospects A-D, Blue Moon, Gigantic)
Commodity: Cu, Pb, Zn, Ni, Co, Ag, Au, Mo, Bi
Dates: March 1971 – April 1971

Tenement AP2380 covered the majority of the Tennant Creek Tenement and extended further north and east. Prospects B, C, and D are within VALE’s Tennant Creek ELA, however Prospect A to the north of the Barkly highway is outside of VALE’S ELA.

Exploration was for disseminated copper mineralization in the Helen springs volcanics and for Tennant Creek style iron ore copper gold within the eastern extension of the Warramunga Group. Works focused on the Western area of AL2380 (Now the W area of VALE’S ELA, where Warramunga group seds were known to outcrop and where the overlying Cambrian seds were known to be relatively thin)

- Gridding,
- Costeaming
- Ground magnetometer, scintillometer surveys – rad anomalism over Gum Ridge formation
- Geochemical soil sampling (auger)
- Rock Chips & Petrology – 6 specimens,
- Drilling – Airtrack and Auger geochem drilling
- Drilling – Rotary Percussion Drilling [16 holes]

Report CR1971-0076 contains map of outcrop, local grid over outcrop and pictorial geological logs of holes drilled through outcrop. Several holes record Cambrian Gum ridge formation at or near surface. Sketch mapped as ‘Chert breccia’ from surface to -15 feet depth in one hole that intersected water & had a location plan. Difficult to ascertain exact location of collars, although this may be done using outcrop boundaries

Report CR1971-0084: Contains assay results [Cu, Pb, Zn, Ni, Co, Bi]. At Prospect C a map illustrates a Chert outcrop in the east, and a Scree zone and a ‘geobotanical anomaly’ to the west of this. The chert is said to be less than 30feet thick & coincides with radiometric anomaly. Magnetic high within chert ridge embayment unexplained (goethite replacement of chert??). This report contains assays and geophysical contour plans.

Report CR1973-0050 contains a plan that may be useful for digitizing grid lines.
EL64 (Prospects A to D)  
CR1973-0177  
Company: Kewanee Australia Pty Ltd  
Commodity: Cu, Pb, Zn, Ni, Co, Ag, Au, Mo, Bi  
Dates: 17th July 1972 – 16th July 1973

Final Report.

EL64 was converted from AP2380. It covers the southwesternmost corner of VALE’s Tennant Creek ELA. This report is a summary of the three AP2380 reports (above).

EL97 (Gosse River)  
Company: Nobelex N.L.  
Commodity: Cu, Bi, Pb, Zn, Mo  
Dates: 30/5/1972-39/05/1973

Magnetic Anomalies  
Drill Sections: DDH402-404, SHDH 97-168

Exploration was aimed at magnetite bodies similar to those housing Tennant Ck style Cu/Au deposits.

Ground mag surveys identified anomalies followed up with drilling & mag susceptibility testing 13 shallow holes across GR109 anomaly.
- DDH402 (680 feet) to test anomaly GR301 – high temp metamorphic sequence (possibly derived from Warramunga group sediments) adjacent to acid granite intrusive. Manetite rich rocks intersected between 366’6” and 395’ and 421’-493’9”. No significant assays.
- DDH403(580 feet) to test anomaly GR107 – Ash-mudflow crystal tuffs intruded by thin lamprophyre dykes. Tuffs carried disseminated magnetite, explaining anomalism. No significant assay.
- DDH404 (500 feet) to test anomaly GR405 - chloritically altered syenite carrying variable concentrations of magnetite and sulphides – pyrite & minor chalcopyrite. Assays indicated minor gold values in upper DDH404.
- SHDH92 (230 feet hammer hole) to test anomaly GR405 – chloritically altered syenite carrying variable concentrations of magnetite and sulphides – pyrite & minor chalcopyrite.

EL1573, EL1574  
CR1979-0132  
Company: Energy Partners  
Author: KH McMahon  
Commodity:  
Dates: 2/10/1978 – 1/10/1979

The report contains a photogeological map showing Warramunga seds and granite within EL1574 and Warramunga seds and Middle Cambrian Gum Ridge Formation within EL1573

EL2649 (Leslie’s Find)  
CR1982-0033  
Company: CRA Exploration Pty Ltd  
Commodity: Au, As, Cu, Pb, Zn, Ag, Bi, Co  

EL2649 covered a section along the middle of the northern side of VALE’s ELA.

22 vertical percussion holes [PD81BA1 – PD81BA22] were drilled along the Barkly Highway at a point where gold had been previously recorded (in a rock specimen no believed to have been alluvium not bedrock). Assays showed no significant gold or base metal values. No further work was recommended.

Drill traverse was to the North of the Barkly Highway and VALE’s ELA.
Loam and gravel samples collected, however no indicator minerals were found.

The target was kimberlite pipes.

9 gravel and 50 loam samples were collected and processed at Ashtons Perth Laboratory. Gravel samples were taken from trap sites in streams, where approximately 30 to 35kg of minus 4mm material was collected. Samples were processed at Ashton’s Perth laboratory where they were concentrated by Wilfley table and heavy liquid separation. The heavy liquid used was tetrabromoethane which has an SG of 2.96. Any apatite (SG 3.19) in the sample should at this stage go to the concentrate. Sizing and magnetic and electrostatic separation of the concentrates followed, which probably excluded any apatite. Concentrates were only observed for diamonds.

Exploration for kimberlite pipes. 60 x loam samples - none contained kimberlite indicator minerals.

EL4536 overlapped a portion of the western and southern sides of VALE’s ELA.

Exploration for kimberlite pipes.

Regional gravel sampling undertaken, however despite the fact that a number of gravel samples were found to contain microdiamonds, the exploration program failed to locate a kimberlite pipe within the licence and the EL was surrendered.

Exploration for Tennant Creek style Au/Cu/Bi in Warramunga ironstones.
Vale Exploration Pty Ltd

EL 27580, Annual Report, Year Ended 3 March 2011

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Airborne geophysics identified 15 aeromag anomalies. Ground mag samples were conducted on local grids and RC drilling undertaken at some anomalies. ‘Explorer 223’ anomaly (453500E, 7805000N) – 7 RC holes intersected qtz porphyries, granodiorite, contact metamorphics and sediments. Anomaly ‘Explorer 227’ at 7793700mN, 466800mE (formerly known as Gosse River III Anomaly 3) 25km south of Gosse River crossing. One vertical RC hole [EX227RCH1] 75m deep intersected granite, biotite schist and tuff. Anomaly unexplained.

Concluded that the metamorphic grade of EL5024 is higher than that of the Tennant Creek central field and that the greater prevalence of igneous rocks and tuffs suggest that the lithologies are not part of the Warramunga group – hence downgrading of prospectivity.

Note drilling was outside of Tennant Creek Project.

EL5199
Company: PNC Exploration (Australia)
Author: Mackie, A.
Commodity: U
Date: 27/03/1987 – 26/03/1988.

EL5199 overlaps the majority of VALE’s ELA.

Exploration focussed on Tennant creek style Au/Cu/Bi mineralisation.

- Fixed wing airborne magnetic/radiometric survey flown by Kevron. NS lines 500m spacing, EW tie lines 1km spacing, 80m height.
- Ground magnetic survey
- Gravity survey 4 EW & 3 NS traverses, 186 stations, 1km apart.
- Downhole Count
- Petrography

EL5199 is said to contain a number of chert outliers mapped as Gum Ridge formation. These generally outcrop as low rises or small hills. The chert is generally greenish-grey or yellow brown and is fractured and brecciated. Weathered basalt of the Helen Springs Volcanics underlies the chert in the SW part of EL5199.

Bouger anomaly contour plan shows a NW trending gravity ridge which transects EL5199 and approximately parallels the regional strike.

Spectrometer data was collected but not contoured. A number of discrete Thorium anomalies were present (these are said to be possibly contained in surface laterite, however it is not know whether this was demonstrated).

A magnetic ridge roughly parallels the gravity high but is offset from it. Five discrete dipole anomalies were noted.

RC drilling was conducted on an oblique SW-NE trending traverse across the tenement. Drilling in the SW of EL5199 showed the area to be underlain by the Carraman Formation in part intruded by granitoids. Holes KK9, KK10 and KK13 in the NE intersected dolomite, siltstone and chert plus acid and basic volcanics, inferred to be Cambrian Gum Ridge Formation?

Logs, location plan and assays [KK5 only] are included in CR1989-0245.

EL5732-EL5734
CR 1989-0268-270, CR1990-0449
Company: Metana Minerals
Author: Pearson, J.
Commodity: Cu/Au
Date: 1/2/1989 – 31/01/1990
Relinquishment Report.

Exploration for Tennant Creek style Cu/Au?

Reinterpretation of regional geophysical survey using second vertical derivative. No discrete mag anomalies or major regional shear zones were identified and ground was relinquished.

**EL6376**
**CR 1990-0320**
Company: Remfrey, G. S.
Commodity: Au
Date: 8/2/1989 – 7/02/1991

Reconnaissance traverse sampling. Samples examined for free gold – none found.

**EL7690 (Montreal Prospect)**
Company: Poseidon Gold
Authors: Worland, R
Commodity: Au, Cu, Bi

Exploration for Tennant Creek Style Au-Cu-Bi. Tenement EL7690 overlaps the NW corner of VALE’s Tennant Creek ELA.

- **RAB Drilling** – 28 vertical holes [MNRB001 – MNRB0028] for 580m,
- **Aeromagnetic TMI**

Aerial magnetic survey defined a broad mag high feature intersected by NWNW lineaments displaying sinistral displacement in the Sthn portion of the licence. RAB drilling across the mag feature intersected rhyolites & rhyodacites intercalated with siltstones, sandstones and schists. Assays returned elevated Cu and Zn assays which are correlatable with relatively mafic rich rhyodacites, but no other anomalous assay results.

Bedrock lithologies are not Carraman formation of the Warramunga group but appear to be later coarser grained seds and intercalated felsic volcanic rocks.

EL7690 was cancelled with the granting of SEL8687. Logs, assays, location plan included in report.

**EL7692 (Los Angeles, Malibu, Beverly Hills Prospect)**
Company: Poseidon Gold
Authors: Worland, R
Commodity: Au, Cu, Bi

- **Aeromagnetic Survey** – Contour Plan
- **Ground magnetic profiles**
- **RAB Drilling** - 25 holes [LARB001-LARB025] for 1554m

Coincident broad gravity and magnetic highs. The broad magnetic high contains two dipole magnetic anomalies coincident with WNW lineaments at Malibu & Beverly Hills prospects.

Ground mags showed source for these anomalies (believed to be Warramunga group rocks) is in excess of 400m below surface. Orientation RAB across one of the mag anomalies intersected deeply weathered cherts interpreted to be part of the Georgina Basin Cambrian sequence of sediments which overly the prospective Warramunga group.

RAB collars, logs, Assays [Au, Cu, Bi, Pb, Zn, Ag, As, Mo]
EL7985 (Gigantic South)


Company: Giants Reef Exploration
Authors: Simpson, P. G. and Russell, S. C.
Commodity: Au, Cu, Bi
Date: 10/06/1993 – 9/06/2001 Final Report

Exploration for Tennant Creek Style Au-Cu-Bi.

EL7985 overlaps the SW quarter of Vale’s Tennant Creek ELA.

Year 1:
- Gridding, southwest, south & se of Metallic Hill.
- Gravity - 500m x 500m spacings defined an elevated residual gravity response (favourable)
- Lag sampling - strong Bi anomaly centred around Metallic Hill claims
- RAB drilling over strongest part of Bi anomaly – no anomalous Bi
- Aeromag survey - June 1993, 80m spaced N/S lines.

Year 3
- It was noted that the western blocks of EL7985 lie at the southern edge of a wide gravity ridge.
- Soil sampling – no obvious multi-element anomalies. Extensive Bi geochem anomaly found from WMC’s 1993 lag sampling is only surficial and not detectable in soil below surface lags (lag anomaly attributed to windblown Bi contamination from old workings at Metallic Hill).
- 1.7km surveyed grid tied to Gum Ridge trig point
- Aeromag data reinterpreted

Year 4
- Ground Gravity survey, 25m spaced readings along single traverse. Local peak coincides with low order Cu-Co soil anomaly.
- Rock chip sampling: 20 + 12 samples of Warramunga formation
- Magnetic anomaly at Explorer 195 [442800mE, 7833900mN] visited but under cover.

Year 5
- Gridding

Year 6
- Two shallow, low amplitude mag anomalies (which may indicate the presence of prospective but weakly magnetic rocks, such as haematitic ironstones or haematite shales) selected for drill testing
- RAB drilling – 5 holes for 300m [GSP001-GSP005]

Year 8
- Rehabilitation – of sample bags and percussion drill sites from year 6.

Lag geochem sampling produced a dextensive Bi anomaly. RAB and soil sampling confirmed lag anomaly is probably caused by the spread of Bi contamination from the old workings at Metallic Hill.

An area bounded by AMG coords 7829500mNm 7829650mN, 438950mE and 439200mE showed anomalous Cu and Bi values. These anomalies still offer some potential.

The potential for significant Au/Cu/Bi mineralisation is low and the tenement was relinquished.

EL8005 (Barkly East Prospect, Edge Prospect, Commitment Prospect)

CR1995-0141, CR1995-0182

Company: Poseidon Gold Ltd
Authors: Worland, R. J.
Commodity: Au, Cu, Bi
Date: 15/12/1993 - 25/11/1994 Final Report

Exploration for Tennant Creek Style Au-Cu-Bi.

Historic tenement EL8005 overlapped the eastern two thirds of VALE’s Tennant Creek ELA.

30 graticular blocks of EL8005 were relinquished in 2004, because it was required prior to the grant of SEL8687. At the time of relinquishment no field exploration had been conducted within the relinquished
The area of EL8005. The majority of this relinquished area is to the north east of the NE corner of VALE’s Tennant Creek ELA. Works undertaken on the remainder of the tenement included:

- Aeromagnetic survey
- Ground magnetic survey x 2

Ground magnetic profiles & Ground magnetic contours are included in report CR1995-0182. The ground magnetic survey data indicated that the aeromagnetic dipole features appeared to be caused by magnetic sediments and volcanics not ironstone bodies. Tenement EL8005 was cancelled (partly replaced) on the granting of SEL8687.

EL22230 (Gosse Flats)
CR2002-0335
Company: Giants Reef Mining
Author: J Cahill
Commodity: Au, Cu, Bi
Dates: 19/10/2001-18/10/2002

Exploration for Tennant Creek Style Au-Cu-Bi.

No tangible works other than a geological and geophysical assessment which downgraded the prospectivity of the licence area.

EL24014
Company: Red Metal Limited
Commodity: Au, Cu, Bi
Dates: 24/05/2005 -

Exploration for Tennant Creek Style IOCG. Tenement said to contain Middle Cambrian Gum Ridge Formation.

Geophysical data was reviewed and a detailed ground gravity survey comprising 97 stations at 100m intervals on 40m spaced lines was conducted.

SEL8687 (New Hope, Desert Hope)
(NOTE: SEL8687 Includes EL7274 Nob East, EL7690 Montreal, EL7692 Los Angeles, EL7693 Seoul and EL8005 Barkly East)
CR 1996-0097
Company: Poseidon Gold
Authors: Mouchet, P. and Evans, R.
Commodity: Au, Cu, Bi

Exploration for Tennant Creek Style Au-Cu-Bi. Tenement SEL8687 covers most of VALE’s Tennant Creek ELA.

- Vacuum drilling - 105 holes SLV1040-1144 + 237 holes for 1823m
- RAB drilling - 15 RAB Holes [SLRB022-SLRB036] for 901m

April 1995 vacuum drilling 105 holes [SLV1040-1144], to infill earlier regional vacuum drilling. EOH bedrock samples only submitted for assay. Encouraging results.

15 RAB Holes [SLRB022-SLRB036] for 901m drilled on four N-S fences to test geology & geochem targets generated by April 95 program. 300 x 3m composite samples assayed.

October 1995 a vacuum program comprising 237 vertical holes for 1823m was completed (local Comstock grid), to test the New Hope to Desert Hope mineralised corridor along strike and east of Desert Hope. Only bottom of hole bedrock samples were assayed [Au, Cu, Bi, Pb, Zn, Ag, Fe%, Co]. Assays considered worthy of follow up.
Logs, logging codes, assays, sections, plans and grid conversion (ie Comstock to AMG) included in document.

Note: Earlier drilling 102 Vertical holes

**SEL8687 (Gravity Prospect)**

**CR 1996-0405**

Company: Poseidon Gold
Authors: Mouchet, P.
Commodity: Au, Cu, Bi

Relinquishment Report.

Gravity survey conducted. Area relinquished considered to be granitic and unprospective.

**SEL8687 (Gravity Prospect)**

**CR 1996-0953**

Company: Poseidon Gold
Authors: Mouchet, P.
Commodity: Au, Cu, Bi
Date: 25/11/95 – 24/11/1996

**2nd Annual Report**

Exploration for Tennant Creek Style Au-Cu-Bi. Tenement SEL8687 covers most of VALE’s Tennant Creek ELA.

- Regional Vacuum Drilling – 297 holes [GRV001 to GRV297]
- RC Drilling – 2 holes [SLRC001- SLRC002] for 292m
- Ground Magnetics conducted over Comstock Prospect in Feb 1996.

Report contains cords, logging codes, logs, downhole survey data – RC holes, Comstock local grid conversion to AMG, Cross sections, location plan.

**SEL8687 (Gravity Prospect)**

**CR 1997-0191**

Company: Poseidon Gold
Authors: Clifford, B.
Commodity: Au, Cu
Date: 25/11/95 – 24/11/1996

**Second Partial Surrender Report**

Exploration for Tennant Creek Style Au-Cu-Bi

Tenement SEL8687 covers most of VALE’s Tennant Creek ELA.

- Regional Gravity Survey (by PosGold 1991-1993),
- Aircore drilling - 57 holes

Drilling defined a granite/Warramunga formation contact under cover in the western portion of the targeted area. Cambrian cherts of the Georgina Basin succession were intersected in the east portion of the targeted area where drilling failed to penetrate to Warramunga formation basement.

EOH samples assayed [Au, Cu, Bi, As, Co, Fe%]. NSA in area relinquished.
CR 1998-0067
Company: Poseidon Gold
Author: Clifford, B and Stott, J.
Commodity: Au, Cu, Bi

Exploration for Tennant Creek Style Au-Cu-Bi

Tenement SEL8687 covers most of VALE’s Tennant Creek ELA.

Work completed includes 30 RAB Holes [GVRB001-030] for 465 m. Holes said to have intersected Cambrian cherts and siltstones before intersecting underlying Warramunga Formation. Assays [Au, Cu, Bi, Pb, Zn, As, Ag, Co, Fe, Mn] NSA.

**SEL8687**
*(NOTE: SEL8687 Includes EL7274 Nob East, EL7690 Montreal, EL7692 Los Angeles, EL7693 Seoul and EL8005 Barkly East)*
Company: Poseidon Gold
Author: Mouchet, P.
Commodity: Au, Cu, Bi

Exploration for Tennant Creek Style Au-Cu-Bi.

Tenement SEL8687 covers most of VALE’s Tennant Creek ELA.

**Summary of Work Types conducted on SEL8687 & Prospects**

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X = Work conducted

All works undertaken on SEL8687 by Posgold / Poseidon Gold / Normandy have been summarised in previous reports. The results of bedrock geological and geochemical testing were negative and the licence was surrendered on 25th August 1998.

- Previous Vacuum drilling Year 1 of tenure CMV211-CMV339 – 102 Vertical holes.
4 CURRENT EXPLORATION DURING REPORTING PERIOD

EL27580 is being explored for phosphate as part of the Tennant Creek project comprising ELs 27580, 27712, 27992 and EL 27713.

The area was applied for on 28 August 2009 and granted on 4 March 2010.

On 6 October 2009, an inspection of the AAPA Register identified two recorded sites.

Following the lodgement of a Mine Management Plan in July 2010, an Authorisation issued 10 November 2010. An updated Mine Management Plan was lodged in March 2011, approval of which is pending at the time of writing this report.

An AAPA Certificate application was lodged in August 2010 and a quote for the work accepted in September.

Commencement of work on EL 27580 during the reporting period has been on hold pending issue of the AAPA Certificate. The Certificate issued on 18 February 2011 and outlined two Restricted Work Areas:

1. near the Kinkayburta Waterhole in the centre of the tenement, associated with sacred site 5858-7 which comprises an ephemeral waterhole on the Gosse River at Kinkeyburta Waterhole; and

2. area associated with sacred site 5758-47, a waterhole near Gum Ridge in the SW corner of the tenement.

It is expected to conduct field mapping, rockchip sampling, geophysical modelling and followup RC drilling of suitable targets in the upcoming reporting period.

5 CONCLUSIONS

Tennant Creek Project, EL 27 580 is being explored for phosphate.

Work completed during the first year of tenure ended 3 March 2011 included an open file literature review and data compilation and review of publicly available geological maps, AAPA Register inspection and Authority Certificate, acquisition of NRETAS environmental data and compilation of a Mining Management Plan.

Work proposed during the 2011 field season includes geological mapping, rock chip sampling, RC drilling and analysis of rock chip and drill samples.
6 REFERENCES


