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2013 Group Technical Report GR-213/13

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(ELR28161, ELR28162)

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Document Owner:	David Hope, Mn Australia, Manager Geological Services
Key Contacts:	Josh Harvey, Mn Australia, Superintendent Geological Services David Hope, Mn Australia, Manager Geological Services
Brief Description:	Annual Group Technical Report (GR-213/11) for activities by GEMCO on Exploration Retention Licences ELR 28161 and ELR28162. Reporting period: ELR28161 17/11/2012 to 30/01/2014 ELR28162 25/11/2012 to 30/01/2014.

EXECUTIVE SUMMARY

Groote Eylandt is Aboriginal-owned land, as granted under the *Aboriginal Land Rights (NT) Act 1976 (ALRA)*. The Groote Eylandt Mining Company Pty Ltd (GEMCO) has its obligations defined in various lease documents including Mineral Leases, Exploration Licences in Retention (ELRs) and Special Purpose Leases (SPLs), a Letter of Understanding dated 13 May 1965 and an Agreement dated 16 September 2006. Groote Eylandt is predominantly composed of a stable basement of Proterozoic quartz sandstones and quartzites. The overlying manganese deposits are part of a blanket of Cretaceous sediments lapping onto the western margin of the Proterozoic basement sandstones and quartzites of the McArthur Basin. The manganese orebody is a sedimentary layer, consisting of manganese strata occurring between clay and sand beds and gently undulates beneath the western plains of the island. It extends over an area of about 50 square kilometres as an almost continuous horizon ranging in thickness up to 11 metres. The ore body is thus essentially stratabound and strataform in character.

This report covers what is commonly referred to as the "Eastern Leases", the two Exploration Licences in Retention (ELR28161 and 28162) east of the main mining leases. Granted in November 2010, these licences cover the areas previously held by GEMCO under Exploration Licence EL10115 and 10108 respectively. A number of activities were conducted during the reporting period (November 17 2012 to January 30 2014). Results from the 2012 drilling program were received and were used to update the geological model. During 2013, an extensive drilling campaign was conducted. A total of 682 Reverse Circulation (RC) holes were drilled totalling 14,159 metres with 4,671 samples collected. Work commenced also on pre-feasibility and feasibility studies in which 12 mud rotary groundwater monitoring bores were installed in various areas of the leases totalling 297.9m. Ongoing cultural heritage and environmental studies were also initiated and are still in progress. One aerial LIDAR survey was conducted to obtain an updated ortho image and a detailed topographic model.

Titleholder	Groote Eylandt Mining Company Pty Ltd (GEMCO)
Operator (if different from above)	
Tenement Manager/Agent	BHP Billiton Manganese Australia
Titles/Tenements	ELR28161 ELR28162
Mine/Project Name	GEMCO
Report title including type of report and reporting period including a date	2013 Annual Group Technical Report GR-213/13
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Corporate author(s)	BHP Billiton GEMCO
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Contact details Postal address	Level 25, Riparian Plaza, 71 Eagle Street, Brisbane QLD
Fax	
Phone	+61732376004
Email for further details	Joshua.d.harvey@bhpbilliton.com

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1.0 Introduction

The Groote Eylandt Mining Company Pty Limited (GEMCO) is a joint venture between BHP Billiton (60%) and Anglo-American (40%). GEMCO has been mining manganese on Groote Eylandt since 1964 in accordance with mining leases granted by the Commonwealth Government and traditional Aboriginal owners. The deposit is located on the western margins on Groote Eylandt the Gulf of Carpentaria in the Northern Territory of Australia (Figure 1).

In November 2010 GEMCO was granted two Exploration Retention Licences (ELR28161 and ELR28162) over the previous Exploration Licences (EL10115 and 10108) to the East of the current mine site. These areas are commonly referred to as the "Eastern Leases". This report summarises the activities conducted in the Eastern Leases during the reporting period (November 17 2012 to January 30 2014).

2.0 Site Summary

2.1 Location and Access

Groote Eylandt is located on the western side of the Gulf of Carpentaria approximately 50 kilometres offshore forming the eastern border of Arnhem Land. GEMCO mines manganese from leases extending over an area of approximately 50 square kilometres on the western side of the island (Figure 1).

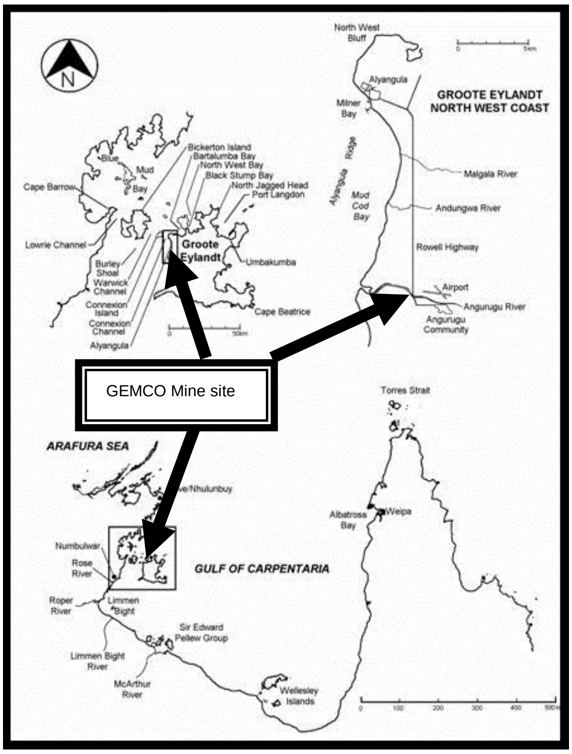

Figure 1 – Location

The port town of Alyangula is located to the north of the mine site and has a population of approximately 1500. The town accommodates both the residential and FIFO workforce on the mine, as well as others associated with government and support services.

The island is serviced by daily flights from Darwin and weekly charter flights from Darwin and Cairns. A weekly barge transports food and supplies to Alyangula as well as equipment and consumables required for the day-to-day operation of the mine. The barge is utilised for mobilising and demobilising of exploration and associated equipment, and town and messing facilities in Alyangula are used to support exploration staff.

The Eastern Leases cover inland extensions to the ore body which extend along paleo embayments to the east of the current mine and are located approximately 6km SE of GEMCO's southern most mining operation (D Quarry), and approximately 16km SSE of the Angurugu community (Figure 2).

Access into ELR28161 is obtained via Emerald River road to D Quarry and then east on a sandy access track. Access into ELR28162 is via Emerald River road south to Emerald River, then east onto the King's Crossing Track approximately 1km south of Emerald River. There is one track connecting the two leases.

2.2 Tenure

2.2.1 Land Status

Aboriginal Freehold Land - Anindilyakwa Land Council (ALC).

2.2.2 Tenements Involved

Groote Eylandt is Aboriginal owned land as granted under the Aboriginal Land Rights (NT) Act 1976 (ALRA). GEMCO's obligations are chiefly embodied in various lease documents including Mineral Leases and Special Purpose Leases, a Letter of Understanding dated 13 May 1965 and an Agreement dated 16 September 2006. These documents cover Mining operations, the township, welfare of Traditional owners, the Eastern Leases and other aspects ancillary to the Company's operations. Table 1 summarises the leases covered in this report.

EL	Area (ha)	Activity	Expiry Date
ELR28161	1,249	Exploration and Pre Feasibility Studies (Previously EL10108)	16 Nov 2015
ELR28162	3,165	Exploration and Pre Feasibility Studies (Previously EL10115)	24 Nov 2015

TABLE 1 – Lease Summary

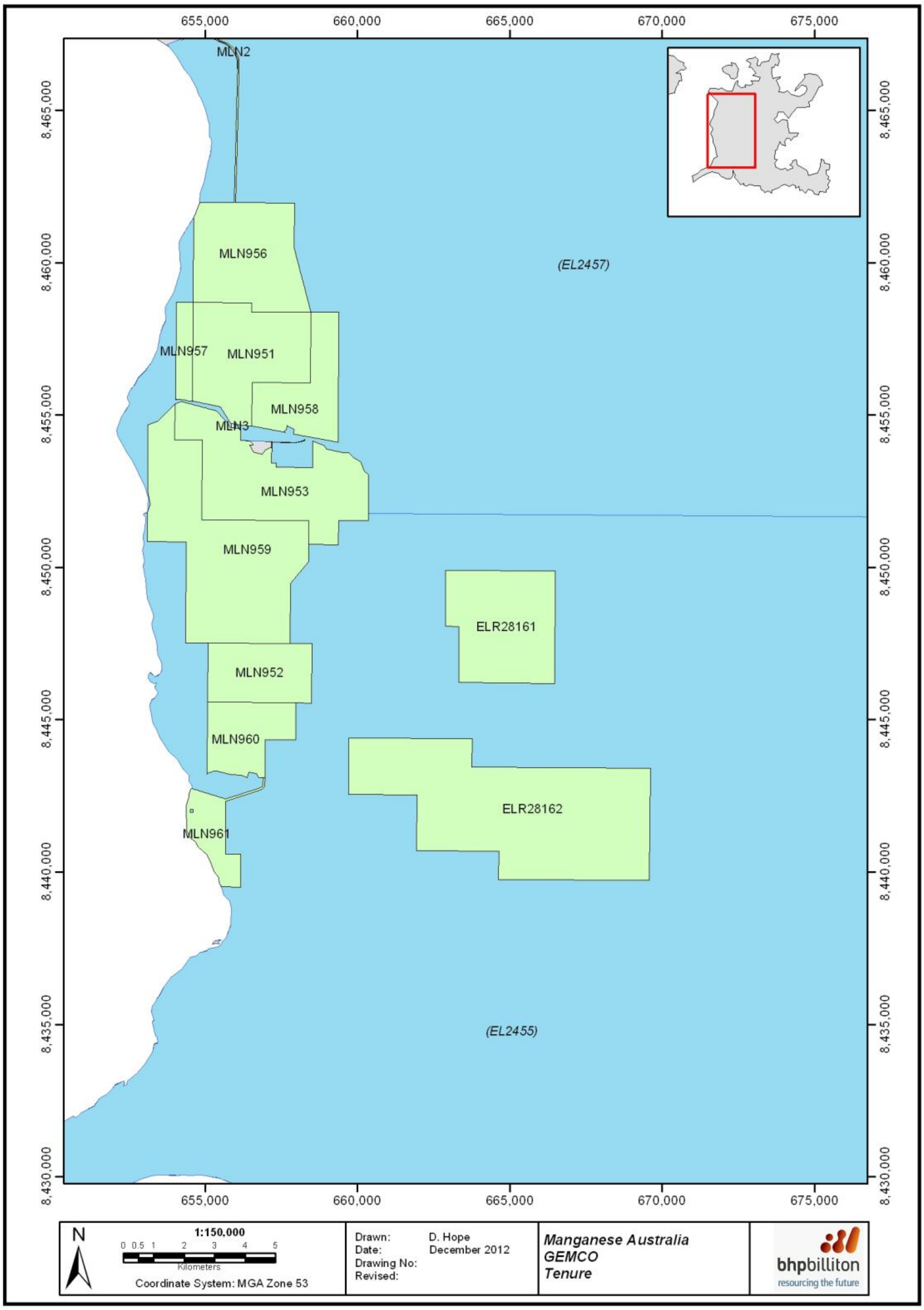

FIGURE 2 – Tenement Map

3.0 Deposit geology

3.1 Geology Overview

The geology and mineralogy of the Groote Eylandt manganese deposits are well documented in the public record. Various sources have been drawn upon to briefly summarise the current knowledge of the Groote Eylandt deposits.

Groote Eylandt is predominantly composed of a stable basement of Proterozoic sandstones and quartzites. The manganese deposits are part of a blanket of Cretaceous sediments lapping onto the western margin of the Proterozoic basement sandstones and quartzites. Erosion channels in the basement have influenced both primary manganese deposition as sediments as well as supergene enrichment by laterisation.

The manganese orebody is a sedimentary layer, consisting of manganese strata occurring between clay and sand beds and gently undulates beneath the western plains of the island. It extends over an area of about 50 square kilometres as an almost continuous horizon ranging in thickness up to 11 metres. The ore body is thus essentially stratabound and strataform in character.

The orebody consists of pisolitic and oolitic manganese oxides. These oxides are thought to have originally been deposited as a chemical precipitate, forming a tabular sedimentary deposit in wave affected shallow sea-floor environments during a period of rising and falling sea levels. Subsequent to deposition, the manganese layer emerged from the sea during a worldwide drop in sea level. The depositional events were followed by a long period of tropical weathering, which extensively modified the upper parts of the sediment profile. Pisolitic manganese oxides underwent partial to complete remobilisation and recrystallisation that resulted in the formation of hard cemented pisolite and massive manganese oxides. The overlying clays and gravels were strongly oxidised and leached to form the iron and alumina rich laterites that are now removed as overburden.

Figure 3 shows the geological distribution of manganese ore on Groote Eylandt. Figure 4, diagrammatically depicts rock types, mining horizon and the relationship to the stratigraphic model.

The ore horizon is covered by laterite overburden ranging in thickness up to 25m. In most current areas, the overburden averages 5m thick. The orebody is typically mined as two different layers:

- **Middle** - massive high grade ore and cemented and loose high-grade pisolitic ore.
- **Bottom** - massive, high silica ore.

In the present mining areas, the mined ore horizon is between 0.5 and 11 metres thick. Currently a maximum of about twenty metres of overburden is being stripped using an Hitachi 2500 excavator (example F3, D, A South, E South and B quarry). Dozers have been effectively employed in pre-stripping since 1995 in some of the shallower quarries where lateritic clay overburden is between 0-15m thick (example F3N, parts of F3, C, F1 and the north east corner of D quarry). Currently mining is being carried out in B, E, F and A series Quarries with ROM product being extracted from G quarry.

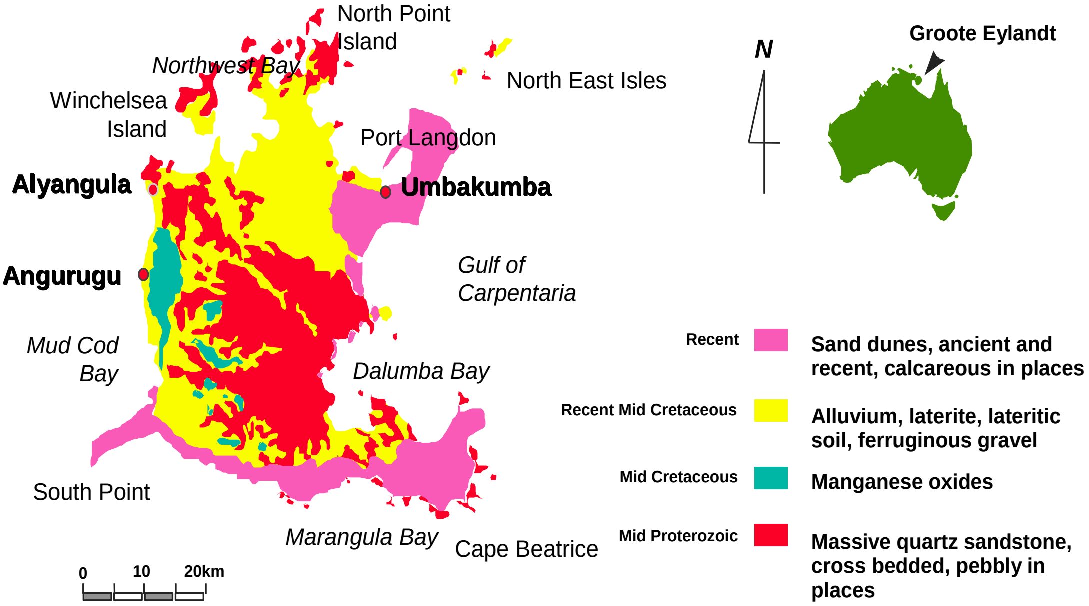

Figure 3 – Geological setting

3.2 Stratigraphy

The Groote Eylandt stratigraphic sequence is as follows in chronological order:

- **Middle Proterozoic Basement** (approx. 1800 Million Years)

  Quartzite: A strongly jointed, massive, near horizontal unit.

- **Lower Cretaceous Sediment Sequence** (approx. 136 Million Years)

  Quartz Sandstone: Derived from the underlying older Proterozoic quartzite and does not contain fossils.

  Glauconitic Sands and Clays: A succession of shallow marine sediments of clays, siltstones and sands. The upper part of the sequence hosts the manganese ore, which occurs in distinct strata. These strataform bodies form an integral part of the sedimentary sequence. The known extent of the manganese oxide deposit is over 20 kilometres in the north south direction. It is open on the western (seaside) and lenses onto and abuts hills of the quartzite basement to the east. Boundaries between sediment types tend to be vertically gradational, although sharp boundaries exist. Substantial sediment ovELRay the basement, although in places the manganiferous horizons may be in direct contact with the basement.

- **Tertiary Laterite and Clay** (3 to 65 Million Years).

  Deep tropical weathering has resulted in the development of thick laterite profiles, consisting of enrichment and depletion of hydrated iron oxides and clays. Both the glauconitic units, including the manganiferous rich horizons and ovELRying gravels and clays are lateritised.

- **Quaternary Soil** (present to 3 Million Years)

Soil **-** Red-brown topsoil forms a thin coverage typically centimetres thick, pockets up to 2-3 meters thick exist.

Figure 4 illustrates a typical lithological column and the relationship to the stratigraphic model of the Palaeo-Proterozoic to recent.

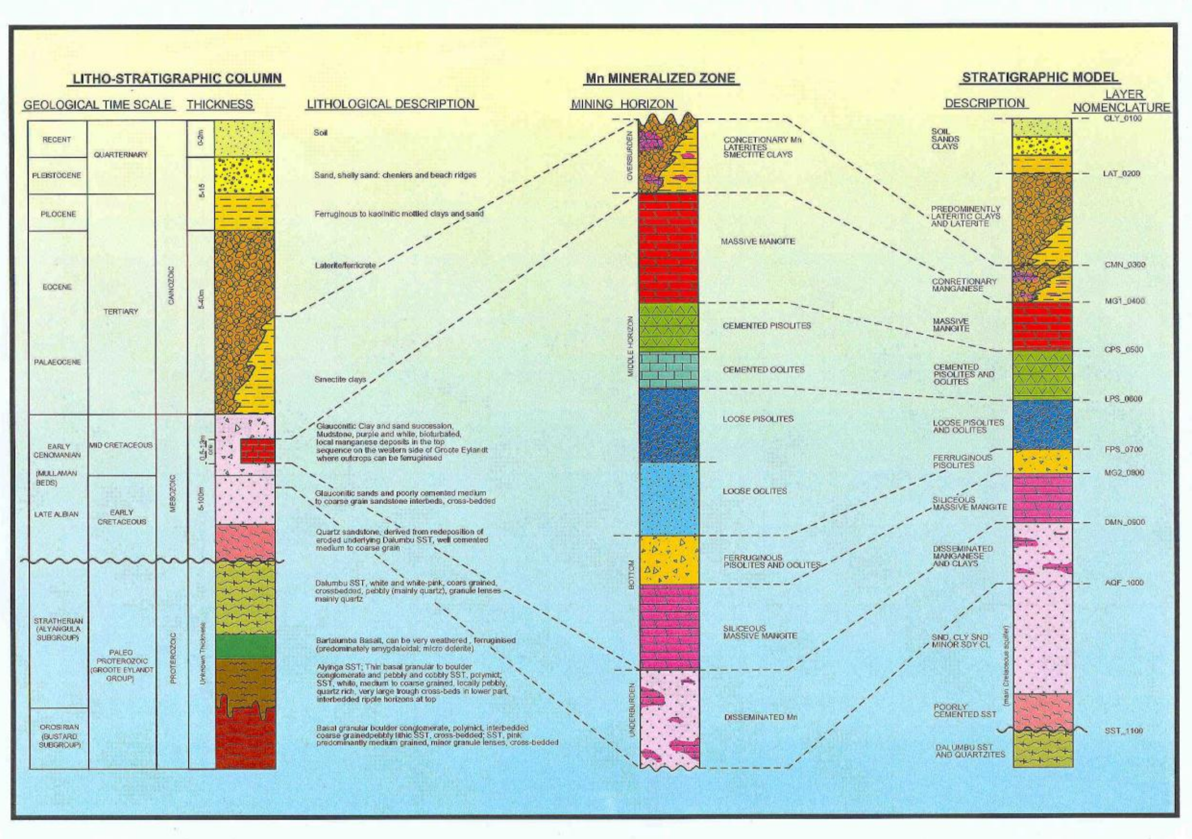

Figure 3 – Stratigraphic profile

3.3 Manganese Ore

The manganiferous deposits have largely resulted from the chemical precipitation of sedimentary iron, alumina and manganese minerals. There are two types of mineralisation, primary and secondary.

3.3.1 Primary Sedimentary Features

Whilst there is no clear evidence to indicate whether the primary manganiferous rich sediments are of organic or inorganic origin, characteristics of both deposits appear to be present within the Groote Eylandt mineralised resource. Oswald J (1990) has postulated an organic genesis for the manganiferous pisolites, suggesting the formation may be a phenomenon of coastal waters, river estuaries, lakes and embayments during a transgression of a stratified metal-enriched sea. An alternative is to consider an inorganic genesis of the pisolites, in which near shore and beach conditions (eg. wave action, long shore drift and winnowing) has strongly affected deposition.

The nature and form of these two potential origins may be significant in terms of modelling. Those areas along the original palaeo-coastline may represent the well-sorted sequence dominated by elongated bars of pisolites and oolites with ribbon like thickening. Whereas in other areas the mineralised strata has formed a blanket cover of shallow embayed zones and deeply filled channels of the palaeo-drainage, with the thickness and form of the layers strongly controlled by the direction and slope of the drainage system.

Mining has exposed primary sedimentary features that suggest a shallow marine environment. The ore contains pisoliths and ooliths, which is evidence of wave action influenced accretion. Inverse and normal graded bedding, cross bedding and ripple marks are evident, indicating deposition during a minor change from marine transgression to regression. In primary ore, manganese pisolites are loosely embedded in a matrix of white kaolin clay with very minor quartz sand. The primary ore is believed to be most closely represented by loose mangan pisolite and loose mangan oolite.

3.3.2 Secondary Manganese Enrichment

Lateritisation has mobilised manganese, iron, alumina and silica in the vertical profile. Manganese oxides through deep tropical weathering, during the Tertiary period have progressively replaced the kaolin matrix in the loose pisolite. This has caused the development of moderately thick laterite profiles above the ore. Diagenetic and supergene processes have recrystallised the primary manganese oxide minerals in the loose pisolite (pyrolusite, romanechite, todorokite, vanadates, lithiophorite, all with kaolinite gangue) to cemented mangan pisolite and massive mangite (dense cryptomelane and pyrolusite) at the top of the pisolitic ore and at the bottom of the siliceous faces.

The area has been extensively lateritised. In the wet season leaching of rocks occurs and in dry season the solution containing the leached ions is drawn to the surface by capillary action to be evaporated leaving salts to be washed away. Na, K, Ca, Mg are readily depleted and this can result in a complex vertical and lateral distribution of chemical environments. Specifically a solution containing these ions under suitable pH conditions can dissolve silica, leaving a clay saprolite. Sequences of smectite clay occur locally over the ore horizons - especially near F1 and C Quarry and regionally north from D quarry to B deposit and A South.

3.3.3 Mineralogy and Dominant Lithologies

The major sedimentary facies influencing ore types were pisolite facies and siliceous facies and these have been overprinted by supergene enrichment processes creating a supergene enriched facies.

Pisolite facies

- Major mineable ore type
- Generally confined to palaeo sea floor terraces close to palaeo highs
- Thickest ore on terraces
- Can be massive, cemented or loose pisolite/oolite
- Pisolite is composed of pisoliths (> = 2mm diameter)
- Oolite is composed of ooliths (< 2mm diameter)
- Found stratigraphically above siliceous facies.

The **supergene enriched facies** can be sub-divided into three main types:

- Massive Mangite - massive textureless manganese oxides usually occurring as a thin layer capping the orebody; formed by secondary recrystallisation and enrichment of primary pisolite ores.

- Cemented Mangan - Pisolite - primary pisolitic manganese oxides strongly cemented by a matrix of secondary manganese oxides; usually occurring in the upper part of orebody. The principle source of Metallurgical Lump ore.
- Loose Mangan - Pisolite - primary pisolitic manganese oxides weakly cemented by a matrix of clay; predominantly kaolinite.

Siliceous facies

- Most widespread manganese mineralisation on lease area is siliceous massive mangite.
- Present as thin bands and disseminations dispersed in clays and sands.
- Ore mineralogy consists of massive cryptomelane and pyrolusite with abundant quartz sand inclusions.
- Formed when supergene processes during laterisation transported Mn (probably from overlying pisolitic facies) to lower stratigraphic levels.
- Lowest stratigraphic manganese ore type - “bottom” horizon. Can rarely occur as thin mineralisation “cap”.

The mineralogy and chemistry of the ore is well described in Leenders’ Volume 1 of “Groote Eylandt Manganese Deposit – July 1995 Resources, pages 12-14.

The geological layers in the model have been classified according to a scheme that may be summarised as follows.

Stratigraphic layer	SLAYER Code	Zone
Soil layer	100	Overburden
Laterite and lateritic clay	200	Overburden
Concretionary Mn	300	Overburden
Massive Mangite Layer	400	Mid
Cemented pisolites and oolites	500	Mid
Loose Pisolites	600	Mid
Ferruginous pisolites and oolites	700	Bot
Siliceous mangite	800	Bot
Disseminated Mn	900	Underburden
Glauconitic sands and clay	1000	Underburden
Basement quartzites and sand	1100	Underburden

Table 2 – Stratigraphic layer classification

4.0 Exploration and Mining History

Between 1963 and 1967, BHP undertook an extensive exploration program on Groote Eylandt. The Groote Eylandt Mining Company Pty Ltd was subsequently formed in December 1964 with special mining leases granted. In March 1966, the first shipment of manganese product was shipped to the Tasmanian Electro Metallurgical Company (TEMCO). TEMCO produces ferro-alloys and manganese sinter.

Mining operations at GEMCO involves the removal of manganese ore by open-cut strip mining. The mining sequence is a continuous cycle; areas where the ore mining void from is backfilled with overburden from the subsequent mining strip. This method results in the mining site moving across the orebody disturbing only a small section of land surface at any given time. The recovered manganese ore is then beneficiated to specified qualities at the mine site before transportation 16 kilometres north to the ship loading facilities at Milner Bay.

In September 1966, the first export shipment was made to Japan. Two years later the beneficiation plant was constructed. This was designed to produce one million tonnes of lump ore per annum. During the mid 1980's the concentrator was upgraded to handle up to 2.3 MTPA. The burgeoning export market eventually saw annual shipments climb to at 2.19 million tonnes by 1990. In recent years, a series of expansion projects have increased shipping capacity to 4.8 Mt by increasing the throughput of the concentrator and improving port stockpiling and ship loading facilities.

The increase in mining depletion to support the expansions has driven the exploration strategy to replace depleted Ore Reserves. Exploration licences were granted to GEMCO for EL 10115 and EL 10108 on the 13 October 2000 in the region of Groote Eylandt known as the Eastern Areas to the east of the main ore body.

4.1 Summary of previous exploration activities

In the first year, an exploration program was undertaken to collect raw data on the potential deposit. This involved aerial photography, ground reconnaissance, upgrading of access tracks, preparation of grid lines and reverse circulation drilling. The drill program intersected between 0.5-4.5m of sub-economic siliceous and medium grade lump manganese in 16 of the 30 holes drilled. From October 2001 to October 2002, the activities focussed on sample preparation and analysis of the samples generated from the RC drilling program in Year One, enabling preliminary data analysis and interpretation of the eastern areas.

During 2003, a broad-based review of all available data was conducted and maps required for target generation were digitised into Vulcan. Investigation commenced on a replacement database and accompanying management system for improved validation and interpretation on the Eastern Area drilling information.

In the fourth year, between October 2003 and October 2004, drill hole data in the GDHS database was converted to a new GBIS database, an outcrop mapping and sampling program was undertaken to assist in identifying potential drill targets and the 1991 GEOTEM data was re-analysed and modelled by BHBP Geophysicists in Brisbane, indicating weak to moderate conductivity of manganese ores and clays. In addition, different EM survey techniques were investigated to differentiate manganese ores from clays.

From October 2004 to October 2005, activities involved compilation of all historical exploration data for review, delineation and target generation, planning of a reverse circulation drilling program, gridline clearing and drill pad preparation to provide access for the drilling rig, and site visits with the traditional land owners to define areas of sacred significance.

GEMCO completed a total of 138 RC drill holes for 3,038metres during 2006. Drilling confirmed the presence of massive (lump) siliceous manganiferous material. Assay results were returned in late 2006. Additionally two diamond holes were also drilled (one in each lease) for measuring of geometallurgical properties.

In early 2007 GEMCO completed geological modelling and a resource estimate of the exploration results. Follow-up infill drilling was planned for the 2007 drill season however, the drilling contract was cut short due to safety concerns around the operation of the drill rig. 32 (all in EL10115) of the planned 161 were completed before the drill was sent off site. 22 of these reported significant intersects of manganese ore (≥1m and >40% Mn).

The 2008 drilling program was abandoned when no tenders were received for drilling that year.

In 2009 GEMCO conducted threatened fauna surveys in the Eastern Leases to obtain preliminary information on the presence of the three Environment Protection and Biodiversity Conservation (EPBC) Act listed threatened fauna species. The drill plan was modified in accordance with the referral. Additional data collected during the 2009 field season was included in an updated submission to the former Department of the Environment, Water, Heritage and the Arts (DEWHA) which resulted in lifting some of the restrictions placed on previous programs.

Infill RC drilling programs have been conducted annually since 2009 and the geological model has been updated with the available results. A summary of drilling activities is included in Table 3 and Figure 4 below.

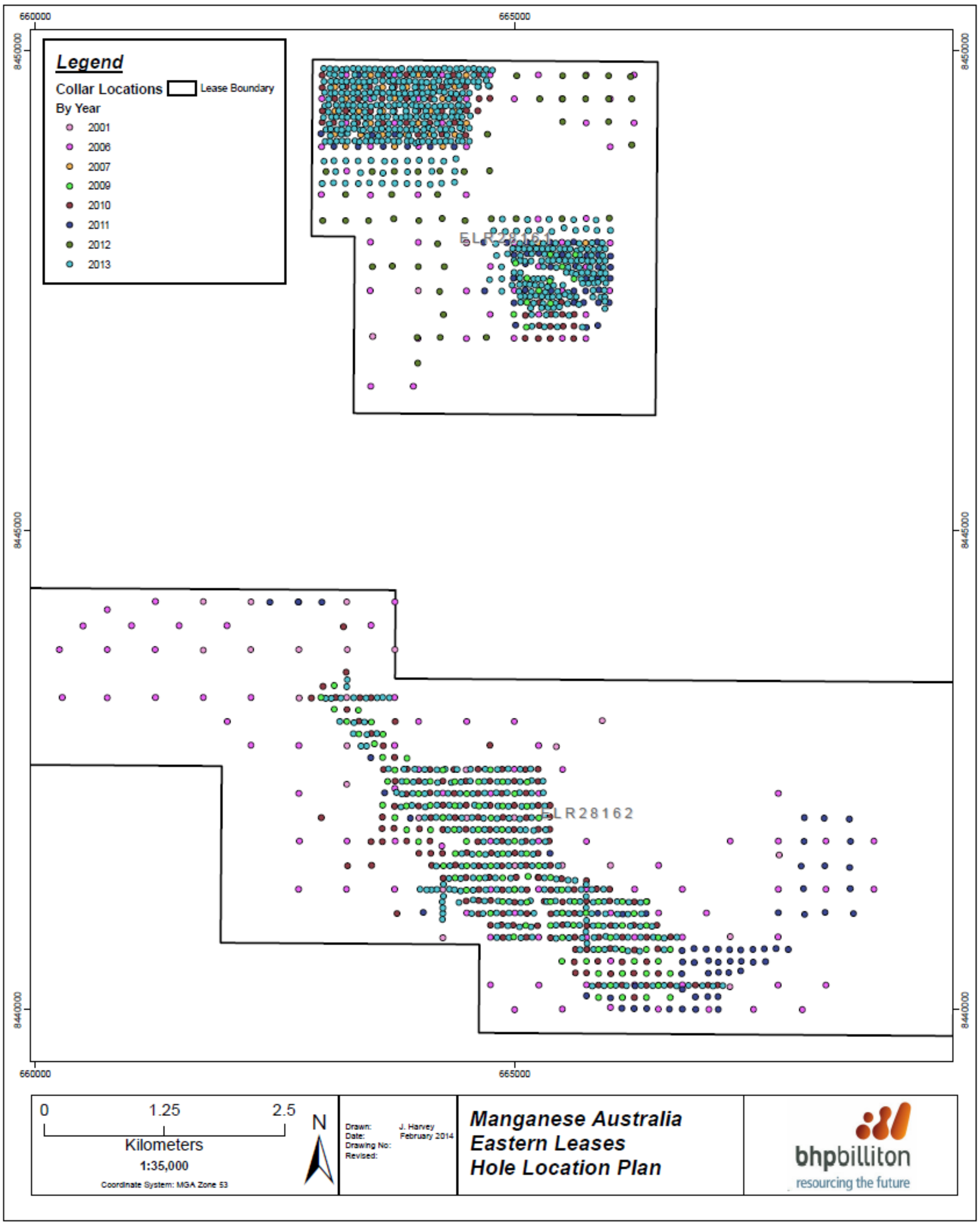

Figure 4 – Drillholes to Date

Year	Holes Drilled	Metres Drilled	Samples Collected
2001	31	958.5	182
2006	138	3038	550
2007	32	564	281
2009	112	2824	1134
2010	212	5490.5	3331
2011	110	2415.5	1561
2012	46	864	384
2013	682	14159	4671

TABLE 3 – Summary of holes drilled per year

5.0 Work Summary

A number of separate work programs were conducted in the Eastern Leases during the reporting period.

5.1 Resouce Definition Drilling

The major focus of drilling for the reporting period was to infill the main ore zone in order to improve its confidence. 682 RC holes were drilled for a total of 14,159m. Drillholes were selectively sampled every 0.5m down the hole within the orebody and submitted for analysis (see section 5.1.3). Table 4 summarises the RC drilling conducted.

	RC drilling	
Lease	**Holes**	**Metres**
ELR28161	449	8,826.5
ELR28162	233	5,332.5
TOTAL	**682**	**14,159**

Table 4 – 2013 Drill program summary

5.1.1 Sample analysis during the reporting period

GEMCO received all outstanding results from the 2012 drilling program and all results have been included in the current geological model. During the 2013 drilling program, 4,671 samples were collected for chemical analysis. To date, 3,975 samples have been processed and uploaded into the drillhole database. Modelling of the results is expected to commence in early April and an updated geological model is expected to be available by the end of June.

Lease	Samples Collected	Results Received
ELR28161	3,012	2,316
ELR28162	1,659	1,659
TOTAL	**4,671**	**3,975**

Table 5 – 2013 Drill program sample summary

All results to date for the current reporting period are included in this submission. Sample results for the 2012 drill program were not reported during the previous reporting period and have also been included.

5.1.2 Drill Hole inclusion in resource model

Various campaigns of drilling have been conducted at Groote Eylandt, however there are significant differences in quality of the various drilling techniques and some samples are considered inappropriate for resource estimation.

All drill holes existing in GEMCO's database have been assessed on individual merit to determine the validity of including all or part of their data. For example, early open percussion drill holes and Caldwell bulk sampling drill holes with valid geological logging but containing samples with incompatible assaying techniques have been used to help control stratigraphic modeling and the estimation of yield and density, but have been excluded from the grade estimation. This approach is in line with recommendations contained in Dr John Cottle's "Resource Estimation Models Review" of 1997.

All drill holes with valid geological logging were used to determine stratigraphic intervals and included: Caldwell bulk sampling; reverse evaluation (open percussion or rotary air blast RE, ST, WB); reverse circulation (RC). Reverse circulation and some RE drilling are the only holes used for grade estimation. This data provides the most comprehensive coverage of the leases; were drilled for resource definition and have compatible methods of assaying.

A resource model update was completed in 2013 using the updated methodology introduced by the Quantitative Group (QG) in 2010. The included drill holes were almost entirely RC type holes. All results up to the 2012 drilling campaign have been included in the 2013 resource model update.

5.1.3 Sampling and analytical procedures

RC drill samples submitted for assaying have been split into various fractions as a means to replicate the recovered grade of manganese after scrubbing, screening and heavy media separation in the concentrator. Up to five sub-samples were prepared for each sample. The assay types are shown in the table below.

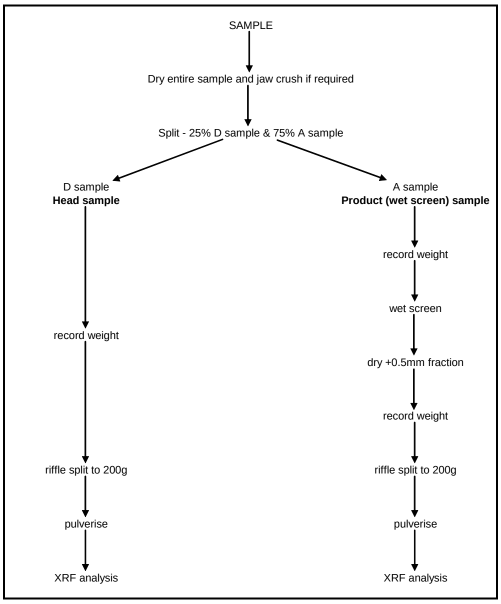

Figure 5 – Sample preparation flowsheet

Only the A and D assays have been used in this resource/reserve estimation. The D assay represents a true in-situ geological sample whilst the other splits more truly describe a metallurgical test to represent likely recovery from processing. Furthermore, it is assumed that the Type A assays give reasonable approximation of the final product, (some bias is recognised by the liberation of free silica during drilling). Previous studies discuss the apparent overestimation of SiO_2 and underestimation of Mn being a consequence of the percussion drilling techniques breaking up material more than the concentrator does. However, the A assay has proven to be the most accurate emulation of the beneficiation plant. The laboratory uses internal and international standards. Recent drilling campaigns include the use of field blank and duplicate samples as well.

Assay Type	Split	Description
A assays	Wash/Screen	A split of the drill sample that is then wet screened at 0.5mm (early samples taken from 1979-1983 were based on +1mm screen)
B assays	Gravity Sep	The portion of the A Sample which has been further separated using bromoform (SG 2.89) heavy media liquid (the material removed is predominantly coarse quartz sand)
C assays	Heavy Media	The portion of the A Sample which has been further separated using tetra bromo-ethane TBE (SG 2.97) heavy media liquid (the material removed is predominantly coarse quartz sand)
D assays	In-situ	A split of the drill sample as received
E assays	Met Test	This preparation was only used for Caldwell bulk samples processed in the Metallurgical Test Plant.

Table 6 – Sample type

Field QA/QC controls consist essentially the placement of an uncertified reference material made up of local homogenised blast hole samples, at a rate of 1 blank per 60 samples. In addition a system of assaying field duplicates at a rate of 1 sample per 30 samples was done. Laboratory QA/QC controls includes regular standard calibrations and the consistent use of internal duplicates. Round Robin assaying has also been undertaken.

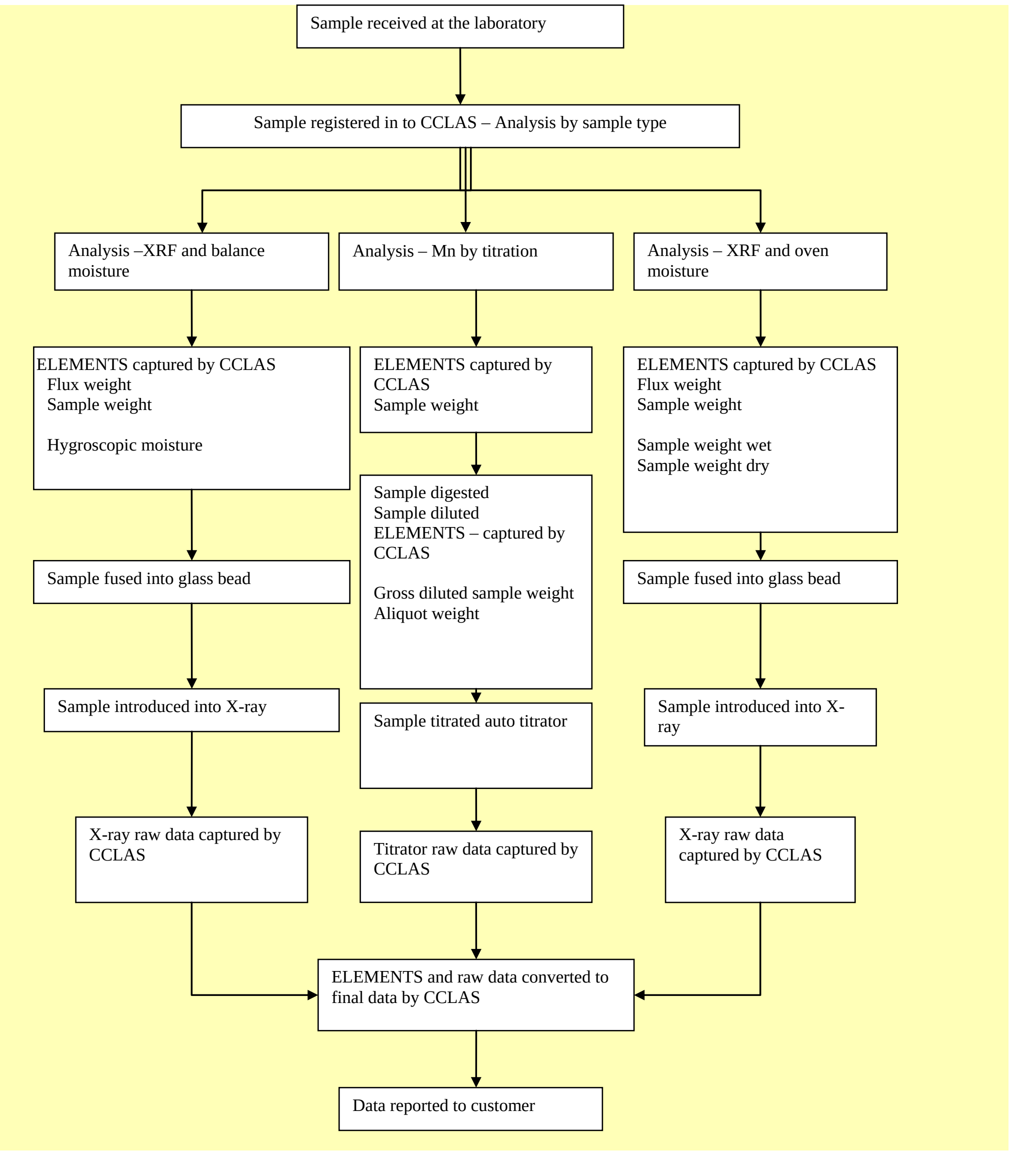

Figure 6 – Assay flowsheet

5.1.4 Resource Estimation

The history of resource estimation is long and complex with various attempts and models been completed over the years. Previous estimations are summarised in Table 1. The Eastern Leases were first added to the resource in 2011.

Estimation	GENCO Total resource (million dry ROM tonnes)
1975 FARAG & SLEE (published)	490 Mt
1985 Mining Mag.(published)	330 Mt.
1990 MINEX	189.9 Mt.
1993 MRT model	209.8 Mt.
1995 BHPE model	168.8. Mt
1995 BHP GEMCO model	149.2 Mt
1998 MINEX model	179.5 Mt
1998 BHP GEMCO model	138.8 Mt
1998 RUNGE model	227.6 Mt.
2000 (MAPTEK / SRK) GEMCO model	205.4 Mt
2000 estimation (2000 model)	205.4 Mt
2001 estimation (2000 model)	212.6 Mt
2002 estimation (2000 model)	209.6 Mt
2003 estimation (2000 model)	206.1 Mt
2004 (Snowden / Golder) GEMCO Model	153.35 Mt
2004 estimation (2004 model)	152.8 Mt
2005 estimation (2004 Model)	173.3 Mt *
2006 estimation (2004 Model)	169.4Mt
2007 estimation (2007 model)	169.6Mt
2008 estimation (2007 model)	163.4Mt
2009 estimation (2007 model)	159.8Mt
2010 estimation (2007 model)	155.2Mt
2011 estimation (2011 IRM)	169.2Mt**
2012 estimation (2012 Model)	161.8Mt**
2013 estimation (2013 Model)	175.7Mt**

Table 7 – Estimation history

* The 2005 estimation is in dry ROM tonnes while the 2004 estimate reported dry in-situ tonnes. This change increased ROM tonnes while decreasing yields, leading to a slight reduction in product tonnes from FY2004 to FY2005.

** Updated resource model using modified methodology and additional drilling data; and also includes an Inferred Mineral Resource on the Eastern Leases.

5.2 Groundwater Monitoring

Twelve groundwater monitoring bores totalling 297.9m were drilled in the Eastern Leases as part of an ongoing environmental study to gather baseline data for the area prior to potential mining (Table 8). The holes were drilled using a mud rotary bit and were located in key areas linked to potential pit designs. Ongoing monitoring of the water quality will continue into the next reporting period. Detailed logs are included in Appendix A and are included digitally in this data submission.

	Mud Rotary	
Lease	**Holes**	**Metres**
ELR28161	10	246.9
ELR28162	2	51
TOTAL	**12**	**297.9**

Table 9 – Groundwater Bores

5.3 Aerial Survey

A LIDAR survey was conducted over the mine site and extended over the Eastern Leases. The final survey report is included in Appendix B. The survey data is extensive and will be supplied as an appendix to GEMCO's annual mining report.

6.0 Environmental/Cultural

6.1 Fauna Surveys

In 2009, a search of the Environment Protection and Biodiversity Conservation Act (1999) Protected Matters Database identified three threatened fauna species listed under the EPBC Act database as potentially present within the Eastern Leases area.

In accordance with the EPBC Act (1999), GEMCO submitted a referral of proposed action to the Department of Environment, Water, Heritage and the Arts (DEWHA) for a determination on the proposed exploration works. Prior to submitting the referral, GEMCO conducted threatened fauna surveys in the Eastern Leases to obtain preliminary information on the presence of the three EPBC Act listed threatened fauna species.

Results from the surveys indicated the following;

- An abundance of the Northern Quoll in the area
- Evidence of burrowing activities of the Northern Hopping-mouse. Burrows were generally found to be more abundant close to white rock outcrops
- No signs of the Brush-tailed Rabbit-rat were observed

GEMCO submitted an updated referral in 2010 based on additional data collected during the 2009 drilling season. Some restrictions relating to exclusion zones around the quartzite outcrops (usually sandier in nature) were lifted. GEMCO continues to conduct its exploration activities based on the recommendations from the survey work under the guidelines of its threatened species management plan (STA-3056) which is available on request.

6.2 Culturally Sensitive Areas

Two listed sacred sites exist within and along the boundary of ELR28162. In addition, the ALC conducted an aerial survey in consultation with traditional owners in 2009 and identified additional sensitive areas within the lease. These areas have been removed from the drill plan until further clarity is available.

7.0 Summary of future work

RC resource definition drilling will continue in 2014 to further improve the confidence of the resource. Infill drilling will focus on the southern ELR28162 where the bulk of the drillholes are planned.

A mine waste geochemistry assessment of the Eastern Leases project suitable for the Environmental Impact Assessment process will be carried out in 2014. The assessment will focus on determining the geochemistry of the mined overburden and process residue materials to be generated as a result of development of the Eastern Leases. For overburden, fresh samples will be preferentially collected from targeted drilling holes that have been chosen to intersect with the ore body at depth within each of the quarries.

These samples will be supplemented using other fresh samples collected from the groundwater drilling program and from exploration holes and/or chip samples. The geochemistry assessment is designed to identify any potential impacts that may be associated with mine waste materials including rehabilitation limitations, water and health related impacts as the potential for acid mine drainage.

As part of the Eastern Leases Selection Study and Definition Phase Study, non-invasive geotechnical soil sampling will be carried out in 2014/2015 using a combination of test pits and dynamic cone penetrometer (DCP) in order to determine the suitability and physical characteristics of soils required for the construction of access roads, dams and other associated infrastructure. This work will be scoped in greater detail following agreement on project definition

8.0 Conclusions and recommendations

These leases remain a high priority target on Groote Eylandt. Consequently additional infill drilling is planned to confirm the continuity and tenor of mineralised horizon for the next dry season. Based on the results GEMCO are likely to seek to convert these licences for mining.

9.0 Expenditure

The total expenditure for the reporting period is shown in Table 10 below. Differences between expected and actual costs can be attributed to the early commencement of environmental and pre-feasibility studies.

	Expenditure (AU$)		
Lease	**Covenant for the reporting period**	**Reported expenditure**	**Covenant for upcoming reporting period**
ELR28161	806,000	2,482,275	1,296,000
ELR28162	1,210,000	1,505,725	4,915,000
TOTAL	**2,016,000**	**3,988,000**	**6,211,000**

Table 10 – Summary of expenditures

10.0 Appendices

Appendices have been included in the supporting email and digital media.