Cairn Hill Magnetite-Copper-Gold Mining Project

MINING AND REHABILITATION COMPLIANCE REPORT (MARCR) 2012 – 2013

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Appendices
No appendices
Acknowledgements

Termite Resources would like to thank Health Safety Environment Australia (HSEA), MACCS Group, EBS Ecology (EBS), Care of Our Environment (COOE) and Ecological Horizons (EH) who have provided consultant reports and data facilitating the preparation of this report.

Acknowledgement is also given to the Cairn Hill Project team, including geology, survey, mining production and administration staff, for their overall contributions to the report and for their commitment to excellence over the past year. Acknowledgement also goes to the Exact Mining Services personnel, specifically maintenance and health and safety departments, for their contributions to the report.
1. Introduction

1.1 General

Termite Resources NL (TR, 51% owned by IMX Resources Ltd and 49% owned by Taifeng Group) is owner and operator of the Cairn Hill Magnetite-Copper-Gold Project (the ‘Project’) which is located approximately 55 km south-east of Coober Pedy, South Australia (Figure 1). This report meets the requirement for TR to provide the Department for Manufacturing, Innovation, Trade, Resources and Energy (DMITRE) with an annual mining and rehabilitation compliance report (MARCR) for operations carried out on the Mining Lease (ML) during the previous reporting period. The MARCR complies with the approved Mining and Rehabilitation Program (MARP) and ML conditions.

The MARCR has been prepared in general accordance with DMITRE’s MG3 Guidelines for miners: preparation of a mining and rehabilitation compliance report (MARCR) in South Australia, Version 1.4 (dated March 2009) and includes the following:

- a summary of the major mining activities undertaken in the reporting year and proposed activities for the following year;
- a summary of environmental management and rehabilitation activities for the reporting year and proposed activities for the following year;
- a summary of consultation undertaken in the reporting year, and of complaints (if any) received from third parties and actions taken by TR to resolve these;
- a statement of compliance with the obligations under the Lease conditions and the approved MARP for the year;
- a statement of action taken to rectify any noncompliance, detected either by DMITRE inspections or TR’s monitoring, and to prevent recurrence;
- a statement on the effectiveness of any previously undertaken action to rectify noncompliance;
- any new environmental hazards detected during the year that were not previously documented to DMITRE (e.g. at the time the MARP was approved); and
- environmental incidents that have occurred and how these incidents were managed and resolved.

In accordance with the Lease conditions, TR has completed and submitted three MARCRs to date for the Project:

- Cairn Hill Magnetite-Copper-Gold Project Mining and Rehabilitation Compliance Report 2008 – 2010 (dated 18 June 2010);
- Cairn Hill Magnetite-Copper-Gold Project Mining and Rehabilitation Compliance Report 2010 – 2011 (dated 26 July 2011); and
Figure 1: Cairn Hill Project Location
Figure 2: Cairn Hill Approved Original and Revised Mining Lease Areas
Figure 3: Cairn Hill Design Project Infrastructure (Phase 1)
1.2 Project Background

In July 2007, TR submitted a ML application (and supporting documentation) to DMITRE (then PIRSA) to facilitate the recovery of gold, copper and iron from the Cairn Hill Project Site (the ‘Site’). The Mining Lease (ML6303) which originally covered approximately 80 km$^2$ was granted by the Minister for Mineral Resource Development on 17 April 2008.

In June 2008 TR submitted Development Applications (DA) (and supporting documentation) for ancillary infrastructure which are located outside the ML area (haul road, supply borefield and infrastructure, rail siding and underpass).

The Early Works MARP (EWMARP) covered the trial mining activities and following completion of these activities in September 2008, the EWMARP was revised and updated through a consultative process with DMITRE to form the revised MARP for the Cairn Hill Project. The revised MARP was submitted to DMITRE for approval on 21 November 2008 and was subsequently approved on 26 May 2009. Amendments were made to the Mining Act 1971 and the Mining Regulations 2011, which have been in effect since 1 July 2011, with existing MARPs now deemed to be PEPRs. To avoid confusion for the reader, the currently approved MARP will continue to be referred to as the ‘MARP’ in this report, with any future planned revisions referred to as the ‘PEPR’ (for example, any planned revisions for Cairn Hill Phase 2).

TR undertook trial mining operations within the ML during July 2008. This work resulted in the extraction of approximately 20,000 tonnes of ore and provided valuable information concerning both waste rock and ore characteristics. Minor construction works commenced at Cairn Hill in February 2010. A Mining Services Contract was executed with Exact Mining Services (Exact) in May 2010 and full-scale mine construction commenced.

More recently, TR submitted an application to DMITRE to reduce the size of the Cairn Hill ML area from approximately 80 km$^2$ to the smaller area of approximately 18.4 km$^2$. The revised ML area was consented to by the Deputy Executive Director, Mineral Resources on 22 February 2013. The revised ML area is shown in Figure 2 together with the originally approved area.

As of April 2013, TR had shipped more than 3,600,000 tonnes (3.6 Mt) of ore from the Cairn Hill Project. This ore was extracted from the first phase (Phase 1) of the Project, expected to deliver up to 7.9 million tonnes of ore from two pits. The crushed ore is transported on a dedicated haul road to a rail siding at Rankin Dam (on the Tarcoola-Darwin railway line) for loading onto trains for export through Port Adelaide.

During the next twelve month period, TR plans to continue mining and shipping of the Phase 1 resource at the current targeted shipping rate of approximately 1.8 Mtpa (million tonnes per annum). During this period, IMX/TR also plans to continue their assessment into the feasibility of the second phase resource (Phase 2), located immediately to the east of Phase 1, as well as undertaking a Preliminary Economic Assessment (PEA) for the Mt Woods Project. The addition of the Phase 2 resource to Cairn Hill would trigger the need to update the existing MARP (to be referred to as the PEPR) for the Project in consultation with DMITRE and other stakeholders.
1.3 Commitment

TR is committed to complying with the requirements of the MARP and conditions set out in the ML offer. The Early Works process was of benefit from a mining, environmental and social perspective. During this process TR’s requirements and obligations were reviewed and assessed, and areas requiring improvement prior to full-scale mining operation commencement were identified.

TR currently employs a full-time Senior Environmental Officer and a full-time External Relations and Land Access Manager whose responsibilities include monitoring activities on-Site and within the wider community and providing assistance to Site Management to ensure that the requirements of the MARP are met in relation to the Project. These employees are also responsible for ensuring that the MARCR is completed each reporting year.
2. Description of Mining Activities

2.1 Tenement

The Cairn Hill Project infrastructure, including pits, waste dumps, site offices, ROM pad, magazine and other infrastructure (shown in Figure 3) are located within Mining Lease 6303.

Additional tenements not covered under this MARCR include the haul road and rail siding, which are located within exploration licences EL 4706, EL 5048, EL 4715 and EL 4525.

2.2 Owner/Operator

The Cairn Hill Project is owned and operated by TR (51% owned by IMX Resources, 49% owned by Taifeng Group).

2.3 MARCR Responsibilities

This MARCR has been prepared by TR, with full and ultimate responsibility for all components of the report. The overall responsibility for this report is with Mr Simon Parsons, General Manager for the Cairn Hill Project.

Consultant information used in the preparation of this MARCR was obtained from the following companies:

- Health Safety Environment Australia (HSEA)
- MACCS Group
- EBS Ecology (EBS)
- Care of Our Environment (COOE)
- Ecological Horizons (EH)

2.4 Reporting Period

The Mining Lease (ML6303) was granted by the Minister for Mineral Resource Development on 17 April 2008. TR is to provide DMITRE with an annual MARCR within two (2) months of the anniversary of the Lease grant. The reporting period selected for this MARCR is 1 May 2012 to 30 April 2013. This reporting period has been chosen in order to facilitate ease of reporting for certain components (e.g. obtaining mining volumes mid-month is difficult to achieve).

2.5 Overview

Key characteristics of the mining activities are summarised below in Table 1.
Table 1: Updated key characteristics of the Project (Phase 1)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Location</td>
<td>750 km north-northwest of Adelaide, South Australia 50 km south-east of Coober Pedy, South Australia</td>
</tr>
<tr>
<td>Exploration Licence</td>
<td>EL 4706</td>
</tr>
<tr>
<td>Mining Lease</td>
<td>ML 6303</td>
</tr>
<tr>
<td>Mining Project Area (Phase 1)</td>
<td>Total – 1,408,013 m² Waste Dumps 1 and 2 – 496,630 m² ROM Pad (final) – 118,700 m² Laydown Pad – 90,223 m² Explosive Storage Area – 15,000 m² Site Roads – 143,500 m² Portion of Access Roads – 75,000 m² Pit 1 (inclusive of starter Pit) – 198,960 m² Pit 2 – 270,000 m²</td>
</tr>
<tr>
<td>Mining Method</td>
<td>Open pit</td>
</tr>
<tr>
<td>Mineralisation Comprises</td>
<td>Iron (Magnetite), Copper (Cu) and Gold (Au) for Phase 1</td>
</tr>
<tr>
<td>Mining rate (average)</td>
<td>Dependant on mine scheduling requirements but up to 10,000 bcm per day</td>
</tr>
<tr>
<td>Mine life</td>
<td>Up to 6 years. Project economic and technical fundamentals are to be reviewed bi-annually</td>
</tr>
<tr>
<td>Resource</td>
<td>8.37 Mt @ 46.7% Fe (diluted JORC resource estimate) including 3.77 Mt @ 47.8% Fe Indicated Resource and 4.6Mt @ 45.8% Fe Inferred Resource using a 35% Fe cut off</td>
</tr>
<tr>
<td>Pit dimensions (longest and widest extents)</td>
<td>Pit 1 – 915 m long (east – west) and 375 m wide (north – south) Pit 2 – 500 m long (east – west) and 240 m wide (north – south)</td>
</tr>
<tr>
<td>Processing method</td>
<td>Conventional mobile crushing and screening</td>
</tr>
<tr>
<td>Operating hours</td>
<td>Continuous operation, up to 24 hours per day, 7 days per week</td>
</tr>
<tr>
<td>Tailings Storage</td>
<td>No tailings facility required</td>
</tr>
<tr>
<td>Power source</td>
<td>Mobile Gen sets utilised</td>
</tr>
<tr>
<td>Power requirement</td>
<td>Mobile Gen sets utilised</td>
</tr>
<tr>
<td>Raw water source</td>
<td>Existing production bores (CHPB01 and CHPB02)</td>
</tr>
<tr>
<td>Raw water requirement</td>
<td>Minimal requirements for dust suppression/road maintenance/construction</td>
</tr>
<tr>
<td>Accommodation</td>
<td>All staff reside in Coober Pedy, no on-Site accommodation</td>
</tr>
<tr>
<td>Employees</td>
<td>Up to a nominal 200 people</td>
</tr>
<tr>
<td>Capital expenditure (estimated)</td>
<td>Approximately $24M</td>
</tr>
</tbody>
</table>

The major components of the mine operations and predicted associated footprints are identified in Table 2 for Phase 1.
Table 2: Project Components and Predicted Footprints (Phase 1)

<table>
<thead>
<tr>
<th>Component</th>
<th>Footprint Area (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste Dumps</td>
<td>496,630</td>
</tr>
<tr>
<td>ROM Pad</td>
<td>118,700</td>
</tr>
<tr>
<td>Laydown Pad</td>
<td>90,223</td>
</tr>
<tr>
<td>Explosive Storage</td>
<td>15,000</td>
</tr>
<tr>
<td>Site Roads</td>
<td>143,500</td>
</tr>
<tr>
<td>Portion of Site Access Road</td>
<td>75,000</td>
</tr>
<tr>
<td>Pit 1 (including starter Pit)</td>
<td>198,960</td>
</tr>
<tr>
<td>Pit 2</td>
<td>270,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,408,013</strong></td>
</tr>
</tbody>
</table>

2.6 Mining Activities Undertaken during 2012-2013

The following activities occurred on Site during the 2012-2013 reporting period:

- Drill and blast activities;
- Mining of ore and cartage to the ROM pad;
- Crushing;
- Road haulage;
- Establishment of larger Site offices and crib hut for Exact;
- Expansion of Pit 1 to the west and vertically;
- Small increase to the northern extent of the ROM pad (approximately 35,250 m²);
- Increase in the height of the haul road / bund between the Southern waste dump and Pit 2 to provide increased protection against surface water flows and return flows back to the natural Creek channel (within existing disturbance footprint area);
- Increase in the height of the Northern and Southern waste dumps; and
- Small increase to the southern extent of the Northern waste dump (approximately 25,400 m²).

During the reporting period, mining occurred in Pit 1 down to the 50 RL. The western cutback of Pit 1 has progressed down to 105 RL. Mining from this area utilised two interim ramps at the western end of the south wall, one to haul waste across the top of Pit 2 to the southern waste dump and the second to haul ore to the ROM pad.

Pit 2 was commenced in October 2011 and has currently been mined to the 130 RL. The majority of mining within Pit 2 has been free dig as we are yet to reach the basement rock, however some drill and blast has been required for some localised hard cap rock. Mining in Pit 2 was dramatically reduced during the reporting period to allow a reduction in overall unit costs as a result of commodity pricing uncertainties.
During the next reporting period it is planned that Pit 1 will be mined out to -5 RL, and Pit 2 will be mined to the 105 RL. It is planned that ore will continue to be mined at 1.8 Mtpa and exported at our current capacity of approximately 1.8 Mtpa.

Final design criteria of Pits 1 & 2 have been based upon the ‘trial pit’ design parameters as well as geotechnical fieldwork and the following criteria:

- Ramp width – 22 m (double lane);
- Single lane ramps for bottom (nominally) 25 Vm;
- Ramp gradient – 1:8;
- Batter height – varies between 10 m and 20 m;
- Berm width – varies between 5 m and 10 m; and
- Perimeter safety bunds have been constructed around the crest of the pit(s).

Details of the volume of material mined during the previous year are given below in Table 3.

**Table 3: Mining volumes for the previous year (1 May 2012 to 30 April 2013)**

<table>
<thead>
<tr>
<th>Mining Volume (BCM)</th>
<th>TOTAL (1 May 2012 to 30 April 2013)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste (free dig) (BCM)</td>
<td>146,507</td>
</tr>
<tr>
<td>Waste (drill and blasted) (BCM)</td>
<td>1,742,908</td>
</tr>
<tr>
<td>Ore (BCM)</td>
<td>413,445</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>2,302,860</strong></td>
</tr>
<tr>
<td>Tonnes</td>
<td>1,777,811</td>
</tr>
<tr>
<td>Fe %</td>
<td>52.97</td>
</tr>
<tr>
<td>Cu %</td>
<td>0.59</td>
</tr>
</tbody>
</table>

A plan showing the design of Phase 1 mine infrastructure is shown in Figure 3 above. The current extent of Phase 1 mine infrastructure including additions made during the 2012-2013 reporting period is shown below in Figure 4.

A plan showing the existing Phase 1 vegetation disturbance and rehabilitation areas is shown in Figure 5. Existing disturbance areas are those shown in red hatching, with rehabilitation areas shown in green hatching. The existing disturbance area associated with exploration activities (Phase 2) has also been defined and is shown in yellow hatching in Figure 5.
2.7 Mining Activities Proposed for 2013-2014

Mining will continue in Pits 1 and recommence in Pit 2 during the next reporting period at the rate of approximately 1.8 Mt of ore per year. During this period IMX/TR also plans to continue their assessment into the feasibility of the second phase resource (Phase 2), located immediately to the east of Phase 1, as well as completing a Preliminary Economic Assessment (PEA) and potentially a Pre-Feasibility Study (PFS) for the Mt Woods Project. The addition of the Phase 2 resource to Cairn Hill would trigger the need to update the existing MARP (to be referred to as the PEPR) for the Project in consultation with DMITRE and other stakeholders.
Figure 5: Cairn Hill Existing Vegetation Clearance and Rehabilitation Areas
3. Ore Reserves and Mine Life

3.1 Review of Reserves

3.1.1 Phase 1

The Phase 1 Mineral Resource has been classified and reported above a 40% metal equivalent Fe cut-off grade using *The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves Code (JORC, 2004).*

The Phase 1 Cairn Hill Mineral Resource estimate as at June 2007 (40% Fe metal equivalent cut-off) for an in-situ and undiluted resource was:

- Indicated: 10.5 million tonnes of ore
- Inferred: 4.2 million tonnes of ore.

The resource has been classified on the basis of the Fe, Cu and Au grades as follows:

- Iron (Fe) as magnetite = 51.9%
- Copper (Cu) = 0.4%
- Gold (Au) = 0.12 g/t.

Since the last official JORC Reserve statement by AMC in December 2008, a new Fe cut-off grade of 30% has been applied to the 2007 Resource model resulting in an increase in ore tonnes and a slight decrease in the grade.

3.1.2 Phase 2

The Phase 2 Mineral Resource is 8.37 Mt at 46.7% Fe, which has been classified and reported above a 35% metal equivalent Fe cut-off grade also using *The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves Code (JORC, 2004).*

The Phase 2 Cairn Hill Mineral Resource estimate as at August 2011 (35% Fe metal equivalent cut-off) for an in-situ and undiluted resource was:

- Indicated: 3.77 million tonnes of ore
- Inferred: 4.60 million tonnes of ore.

The resource has been classified on the basis of the Fe, Cu and Au grades as follows:

- Iron (Fe) as magnetite = 46.7%
- Copper (Cu) = 0.03%
- Gold (Au) = 0.005 g/t.

The estimate is based on infill and resource extension drilling completed between June 2007 and April 2011. The Mineral Resource has been estimated over a 3.3 km strike length and was estimated to an average depth of 200 m based on a combination of diamond and reverse circulation (RC) drill hole samples composited to 1 m lengths.
In addition to Cairn Hill Phase 1 and 2, several large, isolated magnetic anomalies occur within a radius of 25 km of the mine. These targets have the potential to significantly increase the size of the resource.

3.2 Additional Potential Sources

The location of the existing Cairn Hill Project is shown in Figure 6, together with IMX’s current ELs and some of the other existing and potential mineral reserves in the Mt Woods Area (Snaefell, Tomahawk and Axehead). In addition, IMX continues to investigate other potential prospects in the wider Mt Woods Area, such as Penrhyn, Arapiles, Eagle and others.

In an Australian Stock Exchange (ASX) Announcement released on 27 March 2013, IMX announced the discovery of new iron rich magnetite formations at the Axehead and Tomahawk North prospects. Six prospects were drilled, the results of which have increased the Mt Woods Project exploration target tonnage by 168-214 Mt. When combined with the existing Inferred Mineral Resource at Snaefell and a review of regional magnetics data and historical exploration drilling, the global exploration target tonnage now totals 1.5-1.8 billion tonnes.

3.2.1 Snaefell

In an ASX Announcement released on 1 March 2012, IMX announced a substantially increased mineral resource estimate of 569 Mt at 27.1% Fe using an 18% Fe cut-off grade at its wholly-owned Snaefell iron ore project. The Snaefell iron ore project is located 12 km west of the Cairn Hill Project within EL4649.

This new estimate represents a 184% increase on the maiden resource of 200 Mt at 27.65% Fe (using an 18% Fe cut-off grade) reported on 12 October 2011. The entire upgraded resource averages over 27% Fe, demonstrating the consistency of the magnetite mineralisation.

The Snaefell magnetite iron ore mineralisation extends for 2.7km, with the mineralisation remaining open along strike and at depth.

In an ASX Announcement released on 19 March 2013, the results of updated test work were reported showing a significant improvement in metallurgical performance from previous testing. Highlights of this work included:

- Increase in the anticipated overall yield from previous test work programs to approximately 28.5% which includes the ability to beneficiate mill feed to around 35% iron through dry magnetic separation on crushed product, delivering a sizeable reduction in estimated operating costs.
- High grade, low impurity magnetite concentrate of above 68.5% iron at relatively coarse grind size of 75 to 80 micron (P80).
- Alternative coarse direct sinter feed product at 65% iron can still be produced with the same flow sheet giving the option to maximise Project returns.

Figure 6: Current IMX Resources ELs with Existing and Potential Mineral Reserves in the Mt Woods Area
3.2.2 Tomahawk and Axehead

On 25 January 2012, IMX announced the discovery of magnetite at its Tomahawk iron ore prospect within EL4706, located 25 km south-east of the Cairn Hill Project. The Axehead prospect is located immediately to the north-west of Tomahawk.

In an Australian Stock Exchange (ASX) Announcement released on 27 March 2013, IMX announced the discovery of new iron rich magnetite formations at the Axehead and Tomahawk North prospects. Six prospects were drilled, the results of which have increased the Mt Woods Project exploration target tonnage by 168-214 Mt.

Twenty-five reverse circulation (RC) drill holes, totalling 3,486 m were drilled during October and November 2012, with all holes returning significant magnetite iron intersections from five prospects near the Tomahawk prospect and from Fitzgerald Dam which is located west of Cairn Hill.

The magnetite-quartz formations were found to have relatively consistent iron grades across their full width, with the formations also displaying minimal weathering of the magnetite mineralisation.

The iron formations continue at depth, beyond all existing drilling and like the Tomahawk magnetite deposit (ASX: 25 January 2012) the magnetite at Axehead and Tomahawk North is coarse-grained.

IMX’s RC drilling at the Tomahawk group of prospects has shown higher average iron grades, minimal oxidation of magnetite and shallower overburden compared to the Snaefell deposit. IMX now plans to complete a program of Davis Tube Recovery analysis to indicate the iron content of magnetically separated concentrates generated from these samples primarily as these smaller, potentially high yielding targets could represent opportunities in terms of resources to develop on a smaller scale start-up project.

Further details of the resource and metallurgy for Tomahawk and Axehead can be found in the ASX Announcements available from [http://www.imxresources.com.au/](http://www.imxresources.com.au/).

3.2.3 OZ Minerals Exploration Joint Venture

An exploration program of IMX’s Mt Woods tenements commenced in early 2010 as a joint venture with OZ Minerals (see Figure 7 for location of joint venture tenements). The likelihood of an economic discovery within the IMX tenements is greatly improved due to the proximity to the Prominent Hill mine and supporting infrastructure.

The joint venture does not cover any exploitable iron ore / magnetite in the Joint Venture Area and the rights to exploitable iron ore / magnetite in the joint venture area are retained by IMX. IMX will continue to have the right to explore for iron ore / magnetite dominant ore bodies. In this regard, OZ Minerals and IMX have also signed a separate Minerals and Iron Ore Sharing Agreement governing the priority of (on the one hand) mining of iron ore / magnetite by IMX and (on the other hand) mining of all other minerals by the joint venture. Under this Minerals and Iron Ore Sharing Agreement, the party with the iron ore / magnetite or other minerals rights with the higher recoverable value of resources in a deposit, will have first priority in respect of the development and mining of that deposit. The joint venture will be offered new discoveries of
copper / gold on the Cairn Hill ML currently owned by TR where those areas are not being used or proposed to be used by TR for any iron ore development and mining operations.
Figure 7: OZ Minerals and IMX Resources ELs
4. **Rehabilitation and Environmental Management Activities**

This section describes the rehabilitation and environmental management activities that occurred during the reporting period designed to meet the outcomes set out in the MARP and Lease conditions. This section also describes the rehabilitation and environmental management activities proposed for the coming year, based on current knowledge of the Site. Detailed information (including raw data, results, figures and methodologies) have not been provided in this section in order to provide a more concise and easy-to-read report.

4.1 **Disturbance and Rehabilitation**

As mentioned in the 2011-2012 MARCR, approximately 40 Native Apricot (*Pittosporum angustifolium*) seedlings were planted in July 2011 along a section of Engenina Creek, located to the south of Pit 1 (see Plate 1 and also Figure 5). During 2012-2013 the seedlings were allowed to develop naturally without additional watering or nutrient inputs. While some seedlings showed good signs of development such as increased height and foliage, others unfortunately perished during the period. This could be the result of cattle grazing activity, insufficient water or nutrients in the topsoil, the presence of diseases and pests or perhaps a combination of these factors. Currently there are only 8 remaining seedlings. The presence of numerous cattle ‘pats’ and tracks throughout the area where the seedlings were planted suggests that cattle activity could be one of the main contributing factors. When planted, seedlings were protected by plastic tree guards held in place with wooden stakes and stones, a number of which were destroyed or moved by cattle. Tree guards have been replaced for surviving seedlings. The condition of the surviving seedlings will continue to be monitored in the next reporting period.

There were no other physical rehabilitation works carried out during the reporting period (e.g. backfilling and scarifying), however the progress of previous rehabilitation works was monitored.
As mentioned in the 2010-2011 MARCR, a decommissioned turkey’s nest dam located adjacent to Bore 7 was backfilled and scarified in April 2011, allowing for natural regeneration (see Plate 2). The progress of rehabilitation was monitored in March 2012 (see Plate 3), and more recently in March 2013 (see Plate 4). Some vegetation (mainly small shrubs and grasses) have re-established within the furrows created after scarifying and there is evidence that rehabilitation is naturally occurring. There was a significant rainfall event in late February to early March 2012 (approx. 60 mm total) which likely resulted in increased vegetation establishment and the green ‘flush’ observed in March 2012. Conditions during the 2012-2013 reporting period were drier than those experienced 2011-2012 and this is evident from the reduced vegetation cover and generally drier vegetation condition (where present) observed in March 2013. Numerous cattle ‘pats’ and tracks were observed within the area which is also likely to have placed additional pressure on the vegetation growth and condition.

A small area of disturbance adjacent to the Bore 1 turkey’s nest dam which was rehabilitated in 2010 was also monitored, as well as a small area of disturbance adjoining the Pastoral Access Road (shown in Figure 5) which was rehabilitated in 2010. Re-vegetation of these areas is also progressing in a similar manner to that seen at the former Bore 7 turkey’s nest dam. The progress of natural regeneration in these areas will continue to be monitored and reported during the next reporting period.
Plate 2: Rehabilitation of Bore 7 turkey’s nest dam (April 2011)

Plate 3: Progress of rehabilitation of Bore 7 turkey’s nest dam (March 2012)

Plate 4: Progress of rehabilitation of Bore 7 turkey’s nest dam (March 2013)
A number of IMX exploration drill holes which lie within the revised ML area have not yet been rehabilitated. Most of these drill holes are sited within the footprint of proposed Phase 2 pits and therefore would not be rehabilitated if mining proceeds in those areas. Drill holes which lie outside of the footprint of mine infrastructure will be rehabilitated progressively throughout the remainder of the Project. Also noteworthy is that those drill holes which were outside of the revised ML area, but inside of the previously approved ML area have been rehabilitated. An update on plans for Phase 2 exploration drill hole rehabilitation will be provided in next year’s MARCR.

The current remaining disturbance area due to previous IMX exploration activities was identified during the reporting period and is estimated at 101,480 m². The area was estimated using GIS software (MapInfo) and the orthophotograph captured by Fugro in September 2011 (shown in Figure 5 above). The disturbance area estimated captures all access roads, drill holes, stockpiles, sumps and other disturbances associated with exploration drilling that have not been rehabilitated at the time of writing. Previously rehabilitated sites have not been included in the estimated area. Likewise, drill holes that are sited within the footprint of existing mine infrastructure have not been included as they have previously been accounted for in the mine footprint estimates.

The total area of disturbed land to date for Phase 1 is 1,280,050 m² (128.005 ha) (see section 5 below for further details). This is below the total predicted footprint for Phase 1 (1,408,013 m²) and no adjustment to the Significant Environmental Benefit (SEB) for the Project is required at this point in time.

There is no predicted additional footprint to the end of the next 12 month period (2013-2014) as a result of planned Phase 1 works.

4.2 Biodiversity

4.2.1 Flora and Fauna Monitoring Program

Several flora and fauna studies have been undertaken for the Cairn Hill Project to date, including:

- Cairn Hill Flora and Fauna Assessment (EBS, 2006a) (initially issued October 2006 then re-issued in July 2007).
- Cairn Hill Targeted Survey and Regional Assessment (EBS, 2006b).
- Draft Haul road (45km) / Wirrida Siding Bird Assessment (EBS, 2007).

The MARP currently states that six-monthly (or bi-annual) monitoring of flora and fauna is required for established flora and fauna monitoring sites (see Figure 8 below).
Figure 8: Location and distribution of fauna and flora monitoring sites across the ML and in relation to mine infrastructure (courtesy of EBS Ecology, 2013)

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TR has fulfilled the MARP requirements since the commencement of operations by undertaking bi-annual flora and fauna monitoring surveys, generally in the seasons of autumn (in March to April) and spring (in October to November). The following monitoring investigations have been undertaken at the Cairn Hill Site to date:

- 2010: Autumn (March) flora and fauna monitoring (EBS Ecology);
- 2010: Spring (November) flora and fauna monitoring (EBS Ecology);
- 2011: Winter (July) flora and bird monitoring (EBS Ecology);
- 2011: Spring (November) flora and fauna monitoring (EBS Ecology);
- 2012: Autumn (April) flora and fauna monitoring (Ecological Horizons); and
- 2012: Spring (November) flora and fauna monitoring (EBS Ecology).

In March 2013, TR sent a letter to DMITRE proposing a reduction in the frequency of flora and fauna monitoring at Cairn Hill from bi-annually to annually. TR has utilised the services of two independent and well respected ecological consultants with significant experience in arid zone ecology, namely EBS Ecology and Ecological Horizons (John Read et al). Both consultants made recommendations to TR that the bi-annual monitoring program could be modified to annual (spring) monitoring without compromising the objectives of the MARP with regards to flora and fauna.

The data collected over the past approximately three years indicates that there is low variability in ground dwelling mammal captures (with the exception of rodent species) and in particular reptile captures, between autumn and spring surveys. Spring is widely regarded by ecologists to be the optimal time for ground dwelling mammal, reptile and bird detection in the arid zone. Furthermore, spring is also the optimal time for identification of floral species due to the presence of reproductive material (i.e. flowers), usually not present in autumn.

In a letter received on 13 March 2013, the Mining Compliance and Investigations Manager from DMITRE acknowledged the proposed reduction in monitoring frequency, advising that the amendment is within the scope of the previously approved MARP and does not result in any change to the environmental or closure outcomes, or the compliance criteria. Based on this, TR has made a commitment to annual (spring) flora and fauna monitoring for the remainder of the Project.

Flora and fauna monitoring continued during the reporting period, with one additional investigation conducted in November 2012 for permanent sites and transects.

The nationally vulnerable Plains Mouse (*Pseudomys australis*) and Thick-billed Grasswren (*Amytornis textilis modestus*) were again recorded during the November 2012 survey. The Plains Mouse accounted for 51% of small mammal captures with a total of 16 captured across all fauna monitoring sites. One Thick-billed Grasswren was observed at control monitoring site CON001 and another individual at VEGCON-10.

At the time of the survey, habitat condition at Cairn Hill had declined over the preceding nine months as part of a natural cycle of drying off after the regionally high rainfall years of 2010 and 2011. The Coober Pedy area received very little rainfall in the ten months leading up to this survey, with only 7.2 mm of rainfall being recorded at the Bureau of Meteorology Coober Pedy Airport Station between mid-March 2012 and the commencement of this survey in late November. Vegetation health was moderate to poor. Grazing intensity
in the area coupled with the dry conditions had led to a reduction in biomass and increases in soil disturbance. Annual grass and herbaceous species had reduced in density and abundance and largely transitioned to a post seeding stage. Vegetative growth had ceased with many plants showing a reduction in leaf cover or considerably desiccated foliage.

For most perennial species, the Jessup transect survey technique, revealed a significant difference in the number of plants recorded within the control and impact zones. The abundance of four species (*Atriplex vesicaria* ssp. (Bladder Saltbush), *Maireana aphylla* (Cotton-bush), *Astrebla pectinata* (Barley Mitchell-grass), and *Sporobolus actinolatus* (Ray Grass), was considerably higher in control zones as opposed to the impact zones. Given that the local stock water source is located near the mine pit (within the impact zone) and these four species are highly palatable for livestock (with the exception of *Maireana aphylla* which has medium palatability), this result is most likely to be primarily driven by grazing rather than mining impacts.

Vegetation at the monitoring sites was noted as having a high density of cow pats, as well as presence of tracks and plant damage from trampling. Flora species such as *Pittosporum angustifolium* (Native Apricot), *Enchylaena tomentosa* (Ruby Saltbush), *Atriplex nummularia* ssp. *omissa* (Old-man Saltbush) and *Eremophila glabra* ssp. (Tar Bush) were noted as suffering heavily from grazing pressures. The ‘Solar Bore’ was suffering heavily from water point pressure, as it is the only available source of water for cattle in the Cairn Hill area. As such, the volume of cattle traffic at the dam is high. The land and vegetation within proximity to, and directly around the dam is highly degraded due to overgrazing and trampling from cattle.

Approximately 20 of the introduced *Carthamus lanatus* (Saffron Thistle) plants were recorded within the ephemeral drainage line near fauna monitoring site IMP001. This is the first recording of the weed species within the Cairn Hill ML area. The plant can occur in most soil types but prefers disturbed clay and loamy soils of high fertility. The plant is restricted to favourable areas (ephemeral drainage lines, dams and other artificial water sources) within the arid zone. Its occurrence within the ML is likely to be the result of surface water flows and the transport of seeds from further upstream rather than as a direct result of mining operations. *Carthamus lanatus* is not declared under the *Natural Resources Management Act 2004*.

Small mammal captures were considered to be very low at both the ‘control’ and ‘impact’ monitoring sites for the November 2012 survey period. This is likely to be a result of low rainfall and unfavourable habitat conditions leading up to the survey event. A comparison with the capture data from the November 2011 monitoring event, which was conducted following and during exceptional climatic and environmental conditions, highlights a downward trend with small mammal populations. The trend was comparable at both the ‘control’ and ‘impact’ monitoring sites.

Reptile pitfall captures were comparable at the ‘control’ and ‘impact’ monitoring sites during the November 2012 monitoring event. Captures also remained comparable between the November 2011 and November 2012 monitoring events. Total (impact and control sites combined) reptile captures within pitfalls for November 2012 was 65 in comparison with 75 in November 2011; equalling a 13 % drop in captures. This relatively small drop in numbers may be a result of the extremely hot day time temperatures experienced for the November 2012 survey period.
An Inland Taipan (*Oxyuranus microlepidotus*) (Plate 5) was captured approximately 12 km south-east of the Cairn Hill mine. The area was investigated after a possible sighting of an Inland Taipan by an IMX surveyor (Mark Hoad). An Inland Taipan skin was located at the site confirming the initial sighting and a live specimen was later captured approximately 5 km west from the location of the skin by EBS Ecology under the appropriate permits. The specimen was vouchered and later had the identity confirmed by the South Australian Museum.

Plate 5: Inland Taipan (*Oxyuranus microlepidotus*) (courtesy of EBS Ecology, 2013)

A road-kill specimen was located on the Cairn Hill Haul Road during the April 2012 monitoring survey (Ecological Horizons, 2012), which represented the southernmost locality for the species ever recorded. The most recent specimen has increased the distribution of the species by approximately 22 km. Interestingly, the specimen has only one temporal scale (the Inland Taipan holotype specimen has two). One other specimen from the South Australian Museum collection of Coober Pedy region specimens also has one temporal scale (Mark Hutchinson pers. com. with EBS, 2012). The two ‘irregular’ specimens are being investigated further by the South Australian Museum (Mark Hutchinson pers. com. with EBS, 2012) in order to determine genetic differences (if any) and the possibility of new sub-species.

Bird diversity and abundance within the Cairn Hill ML was much lower than previous spring surveys, being the lowest since surveys began in 2010, and can probably be attributed to less favourable environmental conditions (such as a reduction in local food sources). In addition to this, the extreme heat experienced during the survey (maximum temperature range 35.3 to 44.8 °C recorded at Coober Pedy Airport) potentially made it much more difficult to successfully observe birds.

The next flora and fauna monitoring survey is planned to occur in early Spring 2013 (preferably during September or October) with the aim of keeping the survey timing consistent from year to year. It is possible that full analysis of the flora and fauna data from all Spring surveys (2010-2013) will occur following the next survey.
4.2.2 Introduced Species (Pest & Weed) Management

As mentioned above, approximately 20 of the introduced *Carthamus lanatus* (Saffron Thistle) plants were recorded within the ephemeral drainage line near fauna monitoring site IMP001 during the November 2012 monitoring. In March 2013, TR hand-pulled approximately 60 of the Saffron Thistle plants (Plate 6) from an area adjacent to site IMP001 and placed them in sealed bags for safe destruction off-Site (Plate 7). The presence of Saffron Thistle across the Site, particularly in ephemeral drainage lines, will continue to be monitored by TR environmental staff throughout the year and also during future consultant monitoring surveys.

![Plate 6: *Carthamus lanatus* (Saffron Thistle) within ephemeral drainage line (March 2013)](image)

![Plate 7: Sealed bags of hand-pulled Saffron Thistle ready for disposal off-Site (March 2013)](image)

During the April (Autumn) 2012 monitoring survey conducted by Ecological Horizons, a small infestation of *Cenchrus ciliaris* (Buffel grass) plants were found along the rail corridor near the Cairn Hill Rail Siding. Plants were all mature and seeding at time of survey. An informal vehicle-based weed survey of the Haul
Road running west to the Rail Siding was carried out on the last day of the survey to look for Buffel grass. The haul road appeared to be weed-free, suggesting that the Buffel grass infestation was derived from the railway line and not the mining operation (Ecological Horizons, 2012). TR environmental staff have been periodically monitoring the condition of Buffel grass in this location since the April 2012 monitoring, in particular looking for signs of new growth after significant rainfall events. TR has engaged a weed management contractor to visit the location during mid 2013 to control the Buffel grass with an initial spraying. Regular surveys and appropriate management will be required to prevent establishment of this problem weed.

Plate 8: Monitoring of Buffel grass condition near the Rail Siding (December 2012)

Plate 9: Monitoring of Buffel grass condition near the Rail Siding showing some signs of ‘green flush’ after recent rainfall (March 2013)

Monitoring for pest fauna species (foxes, dingoes, wild dogs, rabbits, house mice, etc.) has also been undertaken during the period. This monitoring was carried out by both Site personnel throughout the year as well as by EBS Ecology during the November 2012 monitoring event.

The Red Fox (*Vulpes vulpes*) was recorded 33 times by EBS Ecology during the November 2012 monitoring. Three cats (*Felis catus*) and three European Rabbits (*Oryctolagus cuniculus*) were observed, all within control transects. A high density of Foxes was observed within close proximity to the Solar Bore, which is
also consistent with observations made by Site personnel and the landholder (SA Property Pty Ltd) throughout the year. Foxes were more prevalent near the mine ('impact' transects) that at 'control' transects whereas cats revealed the opposite trend. This was also the result of the spotlight transects during the April 2012 (Ecological Horizons) monitoring event.

In order to address the problem of increased wild dog numbers, including foxes and dingoes around the Site, TR commenced a baiting program in December 2012 in consultation with the landholder and the South Australian Arid Lands Natural Resources Management Board (SAAL NRMB).

The type of bait used was 1080 (active constituent 0.04 g/kg sodium fluoroacetate) obtained via the SAAL NRMB and Jade Chemicals. Individual baits were concealed by burying in a shallow hole (approximately 100-200 mm deep) and covering with soil. This method reduces the potential uptake by native animals and wild dogs are known to readily find and excavate buried baits. Neighbours were notified prior to baiting occurring and signage was placed conspicuously at all commonly used property-boundary entrances, such as access tracks, gates, entrances to the Haul Road and Site (see Plate 10).

Baits were placed at selected groundwater monitoring bores near the Site and at strategic locations within the Site, such as near waste bins and under Site offices. Baits were placed on the first day of each baiting 'event' and then left for 1-3 nights before being checked for uptake. If baits were found to be taken, they were replaced with fresh baits. Baiting locations were then left for up to one month before being re-checked. Three baiting events occurred during the period: December 2012 to January 2013, January to February 2013 and March to May 2013. The results of monitoring have been entered into an electronic database for future analysis, although the data has not yet been analysed in detail. Preliminary analysis of the results suggest that there is generally a low uptake of baits within the first 1-3 nights after placement (perhaps 10% uptake), but that this increases to a very good uptake within one month of placement (perhaps 80% uptake or greater). It is not possible to say with certainty whether all baits are ingested by wild dogs or foxes (versus other animals). However, anecdotally Site personnel have reported a drop in numbers of wild dogs and foxes around the mine itself.

Plate 10: Warning signage for 1080 meat baits placed at all commonly used property-boundary entrances to the baiting zone
TR has also made steps to improve the waste management on Site, particularly food scrap wastes from the Site offices which are an attractant for introduced species like wild dogs and cats. The previous open (mesh grid) lidded skips have been removed and replaced with skips which have solid plastic lids. A procedure has been implemented for these lidded skips to remain closed at all times when not in use to minimise the potential for attracting pest species by the odours produced.

The wild dog baiting program will continue as necessary during the next reporting period and analysis of results may be discussed in the 2013-2014 MARCR.

Although 1080 baiting may be having some positive impact on wild dog numbers, it is clear that it would not be having an impact on feral cat numbers. A possible management strategy that TR will consider during the next reporting period is the use of cage trapping (with euthanasia) which is a procedure employed at other arid zone mine sites in South Australia.

In July 2012 a number of rabbit warrens were also destroyed near the Rail Siding using a front end loader to excavate and cover them over with soil.

Plate 11: Rabbit warrens destroyed near the Rail Siding in July 2012 (Left: before and Right: after)

4.2.3 Other

In early January 2013, a number of EMS and TR/IMX employees took part in a Snake Awareness & First Aid training course delivered by Snake-Away Services. The course was designed to give employees a better general understanding of snake types and behaviors, discussion of the risks and control measures as well as first aid measures in the event of a snake bite. A select number of employees also undertook a Snake Removal / Relocation Course. The training also highlighted the fact that all snake species are protected by law and that proper relocation techniques must be employed.

The feedback received from most attendees was that the courses were excellent and well-presented and that most people came away with a better understanding and awareness of snakes. The plan is for all site personnel to undertake the Snake Awareness & First Aid training course within the next year and for site personnel to receive a refresher course periodically thereafter.
4.3 Groundwater

IMX currently holds Department of Environment, Water and Natural Resources (DEWNR) Licence No. 140253 for the taking of water from the Far North Prescribed Wells Area (FNPWA). Table 4 provides the details of the production bores for which a water allocation and Licence are currently held. In November 2012 IMX received approval from DEWNR for an extension to the ‘mine construction’ allocation component (182,500 m$^3$/year) which now expires on 30 June 2014. The ‘taking mining’ allocation component (109,500 m$^3$/year) expires on 30 June 2018.

Table 4: Cairn Hill Project Water Licence Allocation

<table>
<thead>
<tr>
<th>Water Allocation</th>
<th>Aquifer</th>
<th>Bore Number</th>
<th>Purpose</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>300 m$^3$/day</td>
<td>Palaeochannel (Sand / Sandstone Aquifer)</td>
<td>CHPB01 (Bore 1)</td>
<td>Dust Suppression</td>
<td>CL 1628/71</td>
</tr>
<tr>
<td>(109,500 m$^3$/year)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>500 m$^3$/day</td>
<td>(Eromanga Basin)</td>
<td>CHPB02 (Bore 2)</td>
<td>Mine Construction and Dust Suppression</td>
<td>CL 1628/71</td>
</tr>
<tr>
<td>(182,500 m$^3$/year)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Groundwater Monitoring Program (GMP) for the Site was previously reviewed and updated by TR during the 2011-2012 reporting period (submitted to DEWNR on 20 April 2012). The updated GMP was approved by DEWNR on 10 August 2012.

During the reporting period, TR environmental personnel continued to collect monthly water level and water quality data (EC, temperature and pH) for the required monitoring and production bores in accordance with the approved GMP. A groundwater sampling event was conducted in October to November 2012, with groundwater samples sent for analysis to National Association of Testing Authority (NATA) accredited laboratories.

In accordance with the Water Allocation Plan for the Far North Prescribed Wells Area (SAAL NRMB, February 2009), an Annual Water Use Report (AWUR) was prepared for the previous water-use year (1 July 2011 to 30 June 2012) and was submitted to DEWNR on 8 August 2012. As this was the first AWUR that TR had prepared for the Site, a summary of groundwater usage and monitoring activities conducted since the commencement of operations (May 2010) was also provided to give relevant background information to the report.

The total volume of water used in production bores CHPB01 (Bore 1) and CHPB02 (Bore 2) during the 2011-2012 water-use year was approximately 152,579 m$^3$. This was calculated from water meter readings taken on 29 June 2012. Due to the fact that production bore monitoring is conducted on a weekly basis (generally on a Wednesday), the actual meter readings do not often fall on the start or end of a given month.
The breakdown of the volume of water used from each bore is shown in Table 5 below.

Table 5: Annual Water Use Summary (28 June 2011 to 29 June 2012)

<table>
<thead>
<tr>
<th>Bore Number</th>
<th>Water Allocation (m³/year)</th>
<th>Water Use (m³)</th>
<th>Water Meter Reading (m³)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHPB01 (Bore 1)</td>
<td>109,500</td>
<td>101,532*</td>
<td>221,592</td>
<td>29/6/12</td>
</tr>
<tr>
<td>CHPB02 (Bore 2)</td>
<td>182,500</td>
<td>51,047*</td>
<td>84,121</td>
<td>29/6/12</td>
</tr>
</tbody>
</table>

*Calculated as meter reading taken on 29/6/12 minus meter reading taken on 28/6/11.

The total water use at the Site since operations began (Bore 1 and Bore 2 combined total) is approximately 305,713 m³.

It can be seen from Table 5 that the water use in each bore was below the water allocation stipulated in the Water Licence, with water use from Bore 2 being significantly lower than the water allocation (less than 30% of the allocation).

There were no leaks, breaks or breaches in discharge lines and no meter failures recorded during the 2011-2012 water-use year.

The following conclusions were drawn from the monitoring undertaken during the 2011-2012 water-use year:

- There was little variation in reduced standing water levels (RSWLs) for both local and regional bores during the reporting period. In fact, based on the available data, there was little variation for the two-year period 2010-2012.
- RSWLs for PBBH05 (monitoring CHPB01) and PBBH08 (monitoring CHPB02) showed little variation during the reporting period indicating that water extracted from CHPB01 and CHPB02 is not impacting on the regional groundwater table.
- The variance of RSWL in Solar Bore has also been minimal and is comparable with RSWLs measured before operations commenced. This suggests that there has been little or no impact on the SWL of Solar Bore since the commencement of operations in May 2010.
- Comparison of the rainfall and temperature meteorological data for Coober Pedy Airport with the RSWLs for local and regional bores does not yield any discernible patterns of recharge due to surface water infiltration.
- The limited number of data points available for electrical conductivity (EC) and pH makes it difficult to identify conclusive trends at this stage. For most local bores, it appears that the EC has remained within a relatively narrow range during the reporting period (± 1 mS/cm) and that the pH also remained within a relatively narrow range (± 0.5 pH units). This suggests that water extracted from CHPB01 and CHPB02 is not impacting on regional groundwater quality.
- Also of note for Solar Bore is that there is little variance in the field EC data over the reporting period, with field EC in the range of 4.41 to 5.14 mS/cm, indicating that there has been little or no impact from water extraction due to Site operations thus far.
- Analytical results show that the total dissolved solids (TDS) of water collected from Solar Bore (3,060 mg/L) is both below the ANZECC Livestock Drinking Water Trigger Value (low risk) of 5,000 mg/L, which is consistent with field observations, and also below the trigger threshold of 4,000 mg/L stated in the MARP.
• Although analyses show sulfate (as SO$_4^{2-}$) concentrations for CHMB002, PBBH05 (CHPB01) and PBBH08 (CHPB02) exceed the ANZECC Trigger Value and EPP Livestock Value (1,000 mg/L), sulfate concentrations are likely to be naturally elevated for groundwater in the area and it is important to note that these bores are not used for stock watering purposes.

• Concentrations of the reported inorganic parameters (metals) for the bores sampled were either within criteria values or less than laboratory limits of reporting (LORs).

The AWUR for the current water-use year (1 July 2012 to 30 June 2013) is currently being prepared and will be submitted to DEWNR by 30 September 2013. Findings from the 2013-2013 AWUR will be discussed in next year’s MARCR.

4.4 Surface Water

The Cairn Hill Project area is subject to occasional localised short duration flooding despite the arid climate and ephemeral nature of creeks and lakes. In 2011-2012 it was reported that almost a third of the annual rainfall for the area fell in just two days in late February and early March 2012 (more than 60 mm total). This significant rainfall event resulted in surface water flow throughout channels of Engenina Creek, localised flooding and the closure of the mine, haul road and rail siding for a limited number of days.

In April 2012, TR engaged a surface water engineering consultant (Southfront Pty Ltd) to assess the flood risks for the Cairn Hill mine and a report was issued in October 2012. The work included modelling the surface water movement through the mine area and providing concept designs for suitable flood protection for infrastructure (to a minimum of a 1 in 100 year flood event). Different concept designs were developed to select a design with minimal impact on the natural flow regimes while also maintaining sufficient flood protection for the mine operations.

Following completion of the Southfront report, TR commenced liaison with SAAL NRMB (now part of DEWNR) and DMITRE regarding the proposed surface water management works for Phase 2 operations to the east of Phase 1. On 8 November 2012, a Water Affecting Activity (WAA) permit application was lodged with SAAL NRMB for the proposed Phase 2 works. A supporting Surface Water Management Plan (SWMP) for the proposed Phase 2 works was also prepared by TR and lodged together with the WAA permit application. The WAA permit application is currently being assessed by SAAL NRMB in consultation with DMITRE, pending a final decision on the PEPR for Cairn Hill Phase 1 and Phase 2 (when submitted).

Surface water courses (selected major channels of Engenina Creek) are inspected annually for signs of erosion, sediment deposition and water flow. This generally occurs opportunistically once a year after a significant (>20 mm) rainfall event where surface water flow is observed in the channels of Engenina Creek. At this time, surface water and bed sediment sampling is also performed as part of our MARP commitment. This was conducted in March 2012 for selected locations following the February/March rainfall event and an Annual Surface Water and Bed Sediment Sampling Report was produced in June 2012.

Baseline surface water and bed sediment samples were not collected prior to the commencement of operations in May 2010. This was a result of insufficient rainfall during the period when the ML application and MARP were being prepared and also the absence of any significant standing surface water bodies in the area leading up to that period.
The scope of works for the March 2012 surface water and bed sediment sampling included the following:

- Inspection of pre-mining water channels after a significant rainfall event (February/March) to identify sections of Engenina Creek where standing (pooled) surface water was present;
- Collection of surface water samples from sections of Engenina Creek where standing surface water was observed;
- Collection of bed sediment samples from sections of Engenina Creek where standing surface water was observed; and
- Chemical laboratory analysis of surface water and bed sediment samples and comparison with relevant guidelines for the protection of ecological systems.

In total, eight surface water and bed sediment sampling locations were selected. These were generally located in deeper sections of Engenina Creek where surface water was observed to have pooled. Surface water and bed sediment samples from each location were collected from approximately the same point in the water body.

Four ‘control’ sampling locations and four ‘impact’ sampling locations were selected in order to facilitate comparison of controls versus impacts and impact identification. Control locations were selected as those locations in Engenina Creek which were located approximately 5 km or more from the Site infrastructure. Impact locations were selected as those locations in Engenina Creek which were located less than 1 km from Site infrastructure and in most cases, adjacent to Site infrastructure.

It is intended that at least eight locations (four control and four impact) will be used for ongoing monitoring at the Site in opportunistic (event-based) sampling. The locations of pooled water after each significant rainfall event are likely to change. Any modifications to the natural landscape (e.g. diversions, bunds or access roads) are also likely to further modify the locations of pooled water. For this reason, the actual locations for future monitoring may change and will be determined at a later stage.

The analytical results for surface waters have been compared with the South Australian *Environmental Protection (Water Quality) Policy (2003)* (EPP, SA Government) for Freshwater Aquatic Ecosystem Protection Environmental Values (criteria). The ANZECC (2000) Trigger values for 95% Level of Protection for Freshwater Ecosystems were applied in the absence of EPP (2003) criteria.

The analytical results for bed sediment samples have been compared with the ANZECC (2000) Interim Sediment Quality Guidelines (ISQG) Low Trigger Values.

These criteria were selected on the basis that the potential receptor for surface waters and bed sediments on Site is freshwater aquatic ecosystems (in nearby ephemeral creeks). In the absence of Site-specific eco-toxicological information for the Site (i.e. for the aquatic and benthic organisms indigenous to the area), the above guidelines are believed to be the most suitable for comparison of chemical results and are probably overly conservative if anything.

Conclusions from the March 2012 investigation were as follows:

- Based on the field observations and measurements alone, there was no evidence to suggest adverse impacts on aquatic fauna and flora due to the generation and release of sediment or Acid
Rock Drainage (ARD) from mine operations, or the release of fuels and/or chemicals. This observation was supported by the analytical results when compared against relevant assessment criteria for the protection of fresh water ecological systems.

- Observation of surface water pooled at some impact locations indicates that natural surface water flows may have been interrupted by the construction of bunds and access roads. This may have implications for aquatic (and terrestrial) fauna and flora both upstream and downstream of the mine and further investigation may be required to determine this conclusively. Remedial earthworks (e.g. diversions and stabilisation) may also be required to return natural flows downstream.

- There is no discernible difference between chemical results at ‘control’ versus ‘impact’ locations for both surface water and bed sediment samples.

- The pH of surface waters and bed sediments were generally neutral or slightly alkaline, suggesting that there is currently no release of ARD from mine operations to ephemeral creeks close to the Site.

- Surface waters were of variable turbidity (low to high). For those water bodies with higher turbidity, this was more likely a function of the organisms present (e.g. Tadpole Shrimps stirring the sediments) and sediment loads from catchment runoff as opposed to increased sediment loads from mining operations.

- Chemical concentrations that were reported above assessment criteria are likely to be the result of naturally elevated (background) concentrations (e.g. heavy metals) rather than due to the release of fuels and/or chemicals from Site operations.

- The Total Petroleum Hydrocarbon (TPH) concentrations reported in sample CHBS002-CON (control) are most likely attributable to naturally occurring hydrocarbons (either dissolved or matrix) produced from the decomposition of organic matter in the stratum.

- The presence of aquatic organisms such as Tadpole (or Shield) Shrimps (Triops sp.), Trilling Frogs (Neobatrachus centralis) and numerous insects (mosquitoes, flies, etc.) found in large numbers at most surface water locations, suggests currently healthy aquatic ecosystems.

### 4.5 Climate

Historical climate data for the Cairn Hill area is obtained from the nearest Bureau of Meteorology (BOM) weather station, located at the Coober Pedy Airport.

There are however small differences in weather patterns (particularly rainfall) experienced between Coober Pedy and the Cairn Hill Project area with localised rainfall events sometimes experienced in one area but not the other. This is quite common throughout the arid areas of Australia.
TR installed a new weather station at the Cairn Hill Site in June 2012 (Plate 12) and the station has been recording data at 30 minute intervals since the start of July 2012. The weather station is capable of recording temperature, rainfall, wind speed, wind direction, humidity and solar radiation among other parameters. Data is downloaded monthly using wireless communications and software and the data is transferred to an electronic database for storage and analysis.

This weather station provides Site specific weather data for comparison with the historical data obtained from the BOM Station in Coober Pedy and for use in environmental reporting. Data obtained from the Cairn Hill Station for the period July 2012 to April 2013 is shown in Figure 9 together with data for the same period taken from the BOM Coober Pedy Airport Station. It is clear that there is a strong correlation between the data recorded for average maximum and minimum daily temperatures for both the Cairn Hill and BOM Coober Pedy Airport Stations. There is also good correlation between the total monthly rainfalls at both Stations however it is noticeable that the total monthly rainfalls recorded at Cairn Hill are on average much less than those recorded at the Coober Pedy Airport. Where possible in future reporting, the Cairn Hill Station data will be used in the first instance with the BOM Coober Pedy Airport data used to support it.

A lightning / storm detector system has also been installed at the Site to provide early warning against significant storm events.
Figure 9: Comparison of meteorological data from the IMX Cairn Hill and BOM Coober Pedy Airport Weather Stations
4.6 Site Contamination

During February 2013, TR environmental staff undertook an inspection of all fuel, oil and chemical containment areas across the Site with the assistance of EMS safety and maintenance staff. This included inspection of the following areas:

- Explosives magazine
- Main workshop
- Maintenance yard
- Boilermaker’s workshop (‘Boily Bay’)
- Productions bores (Bore 1 and Bore 2)
- Compressed gas cylinder storage
- Fuel farm
- Crusher maintenance workshop and yard

During the inspection, staff working in each area were asked about the types and locations of chemicals stored within those areas. Where chemicals were stored correctly, this was communicated to staff at the time and where improvements could be made immediately these were also discussed with staff at the time of the inspection. Photographic records were taken and an electronic database was created to help track the chemical storage locations, chemical types, approximate volumes, storage vessel types and secondary containment (if present) as well as signage present. Comments relating to the inspection have been passed on to the relevant Site personnel and recommendations for improvement (where necessary) have also been communicated for follow-up action. A follow-up inspection is planned during the next reporting period (within the next 6 months).

TR periodically checks secondary containment (bunding) of all chemical storages across the Site. The design of secondary containment depends on the type and volume of chemical to be stored as well as other factors. As a general rule, the net capacity of a bunded compound in a storage facility must be at least 130% of the net capacity of the largest tank. As a result of inspections of hydrocarbon storages undertaken during the 2011-2012 reporting period, a recommendation was made to increase the capacity of some secondary containment (spill pallets) for temporary storages, such as diesel intermediate bulk containers (IBCs). The majority of these have now been replaced across the Site (see Plate 13).
Plate 13: Improved secondary containment (larger spill pallet) for the Bore 1 diesel IBC storage

4.7 Waste

There is currently no landfill facility operated at the Cairn Hill Project and the majority of waste is transported off-Site to appropriately licensed facilities in Port Augusta and Adelaide.

The types of waste generated at the Site generally fall into one of the following categories:

- recyclables or salvageables (including drinking bottles and cans, scrap metals, tyres and batteries);
- solid wastes (including ‘hard’ wastes and general ‘soft’ wastes);
- liquid wastes (including waste oils, coolant and other chemical wastes);
- septic wastes;
- impacted materials (e.g. chemical spills); and
- process (RO Plant) waste.

Currently, EMS has contractual responsibility for the management of all wastes generated at Cairn Hill, including waste storage, collection and disposal. Veolia Environmental Services (Veolia) is the primary waste collection contractor engaged by EMS to remove waste off-Site. The Port Augusta Resource Recovery Centre (Waste Transfer Station), operated by Transpacific is the closest EPA licensed facility to the Site which can be used for the disposal of most general waste. The Northern Saints Recycling Depot located in Coober Pedy is the closest recycling facility and is capable of accepting drinking cans and bottles for recycling.

Hazardous wastes and liquid wastes (e.g. septic) are collected by licenced contractors and sent for processing at the appropriately licensed facilities.

As mentioned in Section 4.2 above, TR has also made steps to improve the waste management on Site, particularly food scrap wastes from the Site offices which are an attractant for introduced species like wild
dogs and cats. The previous open (mesh grid) lidded skips have been removed and replaced with skips which have solid plastic lids. A procedure has been implemented for these lidded skips to remain closed at all times when not in use to minimise the potential for attracting pest species by the odours produced.

4.8 Dust and Air Quality

TR does not currently have passive dust monitoring stations recording dust levels surrounding the Cairn Hill operations. A follow-up respirable dust monitoring investigation was conducted at the Cairn Hill mine in February 2013 to assess the exposure of employees to respirable dust and quartz and determine the level of risk to their health from these exposures (HSEA, 2013). An initial investigation was conducted by HSEA in June 2011. The monitoring again involved undertaking a total of fourteen personal respirable dust samples for employees working in a range of areas on site (crusher operators, fitters, dozer operators, dump truck operators, loader operators, excavator operators and geologists).

Based on the measured respirable dust and quartz concentrations being typical of the exposures experienced by employees, HSEA reported that the risk to employees’ health from exposure to respirable quartz is low under the conditions of monitoring on 20th and 21st February 2013 (HSEA, 2013). The measured personal respirable dust and quartz concentrations on 20th and 21st February 2013 were at or below the concentrations that were measured in the previous investigation conducted on 28th and 29th June 2011. Dust suppression water sprays have been installed at the crushers and screens since the previous investigation in June 2011. It appeared that most operators have continued cleaning their vehicle cabins using a brush.

Based on the results of monitoring and observations made during the investigation, a number of recommendations were made for the improved management of respirable dust on Site (including improved implementation of the hierarchy of controls and periodic employee health surveillance monitoring). These will continue to be implemented and monitored over the next reporting period and TR will assess the need to complete another round of monitoring.

4.9 Geohazards

Geohazards include Acid Mine Drainage (AMD) and Potentially Acid Forming (PAF) materials as well as asbestiform minerals, radioactivity and earthquakes.

Experience at Cairn Hill and other mines in South Australia and elsewhere, suggests that AMD can be associated with mining of sulphide-bearing ore or waste rock.

An initial AMD study was undertaken for the Cairn Hill Project (referred to as PB, 2007c). The study examined the characteristics of selected samples of overburden sediments, ore and country rock (hanging wall and footwall gneiss). The samples were compared to guidelines to establish their AMD potential classification and to compare the uranium content to determine whether additional investigation was required.

An additional AMD study was undertaken in 2011 (referred to as COOE, 2011). This additional study consisted of a Site visit to investigate the status of sulphide oxidation, verify the AMD model established by
PB in 2007 and provide recommendations to improve the management of AMD at the Site. The additional study was prompted after a small pocket (approximately 50 m²) of fast reacting sulphides was identified in the ore body after a rainfall event.

The COOE study (2011) confirmed that AMD is only occurring within the ore body as predicted by PB (2007c), however it was noted that sulphides (most likely pyrite and pyrrhotite) in small areas of the ore body are highly reactive. Rain and high humidity, while rare in the region, may trigger the rapid oxidation of these exposed sulphides. The associated heat, vapour and sulphuric acid may produce unwanted health, safety and environmental impacts if not adequately managed.

A management strategy was subsequently developed for identifying and managing PAF materials and sulphide oxidation in the waste rock and ore. The following procedures were developed:

- **PRO G009 – Sulphide Oxidation Sampling Procedure** (an appendix to **PRO H010**);
- **PRO G010 – Identification and Handling of PAF Materials In Waste Rock Procedure**; and
- **PRO H010 – Sulphide Oxidation Management Procedure**.

At the end of September 2011, TR also commenced an ARD field trial (shelf life test) to monitor the physical and chemical characteristics of fresh ore over time as it is exposed to surface weathering. A small stockpile of fresh ore has been set aside (see Plate 14), with regular samples collected and analysed to establish the ARD potential and saleable characteristics of the ore. The ore sample was retrieved from a freshly crushed cone on the ROM Pad, which was standard run of mine grade, fresh (not-weathered) ore crushed to a top size of 40 mm. Samples have been collected approximately monthly since September 2011, with samples sent to Amdel (Bureau Veritas) laboratory for analytical testing of the following parameters:

- XRF (x-ray fluorescence)
- ANC (Acid Neutralising Capability)
- NAPP (Net Acid Production Potential)
- NAG (Net Acid Generation)
- DTR (Davis Tube Recovery)

Results are reported back to the Geology department approximately two weeks after sample submission and results are entered electronically for interpretation.

It is important to note that the test sample has a particle top size of 40 mm, and some amount of fluctuation in results is expected due to the non-homogeneous characteristics of the ore particles. During the trial period so far there has been frequent rain events and warm weather.

In relation to acid generation, based on the data received to date, a small amount of acid has been generated, resulting in a gradual decrease in pH. NAPP has decreased and the ANC has in turn gradually increased as the sulphides are consumed by the oxidation process. The study is ongoing and improvements are being made to the procedure as more information becomes available.
To date, no asbestiform minerals have been observed during drilling at the Cairn Hill deposits and are not expected to be encountered due the nature of the mineral deposits.

The possible presence of uranium at ‘nuisance’ concentrations at Cairn Hill was investigated and is included in full in the initial AMD and uranium content assessment (PB, 2007c). All measured uranium contents were below the trigger level for further investigation of 80 ppm.

Cairn Hill is located away from areas of enhanced earthquake activity such as the Flinders Ranges or Tennant Creek area of the Northern Territory, and earthquake risks are considered low.

### 4.10 Carbon Footprint and Energy

TR continued to track the usage of diesel and other energy uses for the purposes of National Greenhouse Energy Reporting System (NGERS) reporting (reporting period of 1 July 2011 to 30 June 2012). TR engaged consultant COOE to assist with preparing their inaugural NGERS report, which was submitted to the Clean Energy Regulator on 26 October 2012. The reported Scope 1 emissions for the Cairn Hill ‘Facility’ were 25,933 tonnes CO$_2$-e. TR continues to track energy data for the 2012-2013 reporting period.

National Pollutant Inventory (NPI) substances contained within many of the substances used on-site (such as oils and paints) were also tracked for NPI reporting purposes (reporting period of 1 July 2011 to 30 June 2012). COOE was also engaged to assist with preparing the NPI report, which was submitted to the SA EPA on 27 September 2012. TR also continues to track NPI data for the 2012-2013 reporting period.

### 4.11 Land and Community

TR has established good working relationships with all of the key stakeholders for the Project and the local community. Consultation has been continuous with these groups during the reporting year.

IMX/TR is committed to being a good corporate citizen and works hard at developing strong relations with surrounding communities and supporting local businesses. IMX Resources has developed and maintains very positive community relations, particularly with the people in and around the town of Coober Pedy.
A conscious decision was made in 2007 to build a village within the township of Coober Pedy. In 2010 IMX followed through with this promise to the community. IMX offers workers and their families who choose to relocate and live in Coober Pedy, a generous annual, local living allowance of $10,000 per year to encourage relocation of our FIFO workers. During the reporting period around 7% of our FIFO workforce has relocated to Coober Pedy. This has resulted in 20% of our workforce residing in the local community. This injects revenue into the local economy, helps to support local businesses and creates employment opportunities in support services for the mine. Having an accommodation facility in Coober Pedy encourages mine workers to become part of the local community, to spend money in local shops and restaurants and participate in local sporting and recreational activities.

Around 28% of our workforce resides in regional South Australia and 81% are South Australian based.

IMX/TR provides sponsorship to numerous events that provides social infrastructure to the most isolated families and communities in Australia. These events include picnic race meetings, bronco brandings, gymkhanas and camp drafts at communities such as Marree, William Creek and Oodnadatta.

Opal mining has been the mainstay of the local economy for nearly a century and has created a unique local culture. IMX supports the Coober Pedy Miners Association Inc. through sponsorship to assist the ongoing operation of an opal exploration program. The goal of the program is to open up new opal fields in the Coober Pedy Precious Stones Field.

IMX/TR sponsors and supports all football clubs in the communities that we operate in. IMX continues to sponsor the Port Districts Football Club (2011, 2012 and 2013) in the South Australian Amateur Football League (SAAFL) and the Coober Pedy Saints Football Club (2010, 2012 and 2013) in the Far North Football League (FNFL).

IMX/TR funds the Breakfast Club Programs operated by Red Cross South Australia at the Coober Pedy Area School and Marree Aboriginal School, ensuring that school children who may not otherwise have anything to eat, start their day with a healthy and nutritious breakfast.

IMX has sponsored many other community initiatives throughout the reporting, including but not limited to:

- 2013 Coober Pedy School Holiday Program
- 2012 Far North Economic Development Forum
- 2013 Coober Pedy Gen Trade Show
- 2013 Coober Pedy Opal Festival
- 2012 Great Breakaways Bolt (outback fun run/marathon)
- Adelaide University Geological Society

The number of Sri Lankan people in the Coober Pedy community has grown exponentially over the past 5 years. There are now over 100 Sri Lankan men, women and children that reside in the town. This has introduced a new ethnic group to the community thereby enriching the cultural diversity of the town. Cricket is the most popular sport in Sri Lanka. In an effort to make the Sri Lankan community feel welcomed into the town; IMX, OZ Minerals, Coober Pedy Concrete and the District Council of Coober Pedy pooled cash and in-
kind support to construct a cricket pitch at the recently re-turfed oval (Plate 15). The new cricket pitch has resulted in many community cricket matches as well as ‘friendlies’ such as Prominent Hill versus Coober Pedy. The cricket pitch project has been an excellent example of community and industry collaboration resulting in significant community benefits.

Plate 15: The Coober Pedy Cricket Pitch Project is an excellent example of the mining industry collaborating with local government to bring about positive benefits for the community

IMX believes that we have been awarded our ‘social license to operate’ and we work tirelessly and diligently to maintain it. This was reflected in November of last year when IMX was judged as the ‘2012 Winner – Large Business Award’ category of the Advantage SA Regional Awards – Far North SA Region. The following month, IMX received the inaugural state-wide award for ‘Overall Winner 2012 – Large Business Category’. It was with much honour that IMX received the awards as recognition of our ongoing commitment to ensuring the economic and social benefits of the Cairn Hill Project are shared with the South Australian community with a special focus on Coober Pedy.

4.12 Cultural Heritage

There are currently no indigenous heritage sites on the Register of Sites and Objects, held by the Aboriginal Affairs and Reconciliation Division (AARD) for the Cairn Hill Project area, including the ML and the access road, haul road and rail siding (Wood and Fitzpatrick, 2007a, 2007b and 2007c).

Work Area Clearances (WACs) were undertaken for the ML area and proposed haul road during Project development in 2006 and 2007 and Native Title agreements were finalised for the Project in March 2008.

Suggested exclusion areas that are avoided by the Project include a 50 m zone extending from Rocky Outcrops southeast of the proposed mine Site, a 100 m exclusion zone from Cairn Hill and an exclusion area along Engenina Creek to the east of the Project Site (Wood and Fitzpatrick, 2007a and 2007b).
Additionally, no places or items of European heritage have been identified within the Project area. Disturbance to non-indigenous historic and cultural heritage sites or items is considered unlikely given the nature of the area and the previous land use history of the Site (i.e. agricultural).

In order to manage potential heritage impacts of the Project TR complies with the following procedures:

- In the event that Aboriginal sites are discovered during Site development, cease work, and contact the Traditional Owners to determine the required assessment of the Site and appropriate management measures, in addition to statutory reporting under the *Aboriginal Heritage Act 1988* (SA).
- In the event that non-Aboriginal historic and cultural heritage sites are uncovered during Site development, cease work within 50 m of the area until a cultural heritage consultant has been contacted to undertake an assessment of the Site and determine appropriate management measures.
- Long term contractors are informed regarding indigenous and non-indigenous cultural history aspects of the operations and obligations if a site is uncovered.

4.13 Proposed Rehabilitation and Environmental Management Activities for 2013-2014

Proposed changes and improvements to rehabilitation and environmental management activities for the 2013-2014 reporting period are detailed below.

**Disturbance and Rehabilitation**

- Continued periodic monitoring of the Native Apricot seedlings planted along Engenina Creek.
- Continued periodic monitoring of the success (or otherwise) of previous rehabilitation works carried out on the ML and of natural re-generation progress.
- Approvals and tracking of any additional footprint proposed as result of Phase 1 works (if any).
- Planning for rehabilitation of Phase 2 exploration drill holes which are situated outside of any proposed footprints.

**Biodiversity**

- On-going biodiversity awareness training for workers at the Site, designed to assist with identifying existing native species and unwanted exotic species (pests and weeds).
- Training in Snake Awareness and First Aid for Site workers to be implemented (consultant) particularly for those workers that missed the 2012 training.
- Continued on-going monitoring for pest fauna species (e.g. wild dogs, foxes, dingoes, rabbits, house mice, etc.) and weed species (e.g. Buffel grass).
- Continuation of a pest management program, including continued wild dog baiting and spraying or hand-pulling of invasive weeds such as Buffel Grass and Saffron Thistle.
- Continued on-going mobile plant inspections for all new plant and vehicles entering the Site.
- Continued annual (Spring) monitoring of all permanent flora and fauna monitoring sites (consultant).
• Continued protection of the permanent monitoring sites from disturbance, including avoiding aligning any new access tracks or infrastructure through or immediately adjacent to the sites.
• Increased engagement with and assistance to the SAAL NRMB in meeting their objectives where possible.

Groundwater

• Continued on-going monitoring of Solar (Budget) Bore and consultation with the landholder (SA Property Pty Ltd).
• Continued on-going monitoring of water levels and water quality data (EC, temperature and pH) for the required monitoring and production bores.
• Groundwater sampling event to be conducted in Q3/Q4 2013, with groundwater samples sent for analysis to National Association of Testing Authority (NATA) accredited laboratories.
• Annual Water Use Report to be completed for the previous water-use year (1 July 2012 to 30 June 2013) and submitted to DEWNR.

Surface Water

• Continued liaison with SAAL NRMB (DEWNR) to assess the surface water concept designs proposed and, if required, agree on a design plus obtain the necessary approvals for Phase 2 (i.e. WAA permit).
• Continued periodic inspection of surface water courses (selected major channels of Engenina Creek) for signs of erosion, sediment deposition and water flow.
• Opportunistic surface water and bed sediment sampling once during the year after a significant (>20 mm) rainfall event where surface water flow is observed in the channels of Engenina Creek.

Climate

• Continued data collection and analysis from the weather station installed at the Cairn Hill site.
• Continued comparison of historical data obtained from the BOM station in Coober Pedy with the Cairn Hill weather station data.

Site Contamination

• On-going site contamination awareness training for workers at the Site, designed to assist with better management of chemical spills and the impacted soils.
• Continued periodic inspections of chemical, fuel and oil storages and secondary containment.
• Continued replacement and improvement of secondary containment across the Site.

Waste

• On-going waste management awareness training for workers at the Site.
• Investigate options for improved waste management to minimise the production of waste using the strategy of Avoid, Reduce, Reuse, Recycle, Recover, Treat and Dispose.
Dust and Air Quality

- Conduct a follow-up respirable dust monitoring investigation for workers at the Site (consultant).
- Improved implementation of the hierarchy of controls and periodic employee health surveillance monitoring in consultation with EMS.

Geohazards

- On-going AMD/PAF awareness training for workers at the Site.
- Continued on-going monitoring of water quality, gases and soil parameters when favourable conditions for AMD exist (e.g. warm and humid weather after rainfall).

Carbon Footprint and Energy

- Continued on-going tracking of the usage of diesel and other energy uses for the purpose of National Greenhouse Energy Reporting System (NGERS) reporting.
- Continued on-going tracking of National Pollutant Inventory (NPI) substances for NPI reporting purposes.
- Investigate opportunities to reduce energy consumption and carbon footprint.

Land and Community

- Continued on-going consultation with key stakeholders for the Project.
- Continued on-going consultation with the landholder in regards to Solar (Budget) Bore monitoring.
- Continued consultation with a number of stakeholders involved with the assessment of a revised PEPR for Cairn Hill Phase 2 with the aim of obtaining approval (if required).

General

- Revise and update policies, management plans, operating procedures and forms for key environmental areas.
- Continue to development Environmental Management System with a view to obtaining future independent certification.
5. **Operations Summary**

The operations summary showing the disturbed areas (footprints) for each area of the Project is shown in Table 6 below. Predicted total Project footprints (revised in January 2011), actual footprints for the last reporting period (2011-2012), actual footprints for the current reporting period (2012-2013), and predicted additional footprints for the next 12 months (2013-2014) are shown. Note that the total Project footprint to date for Phase 1 (1,280,050 m$^2$) is still well below the total predicted footprint (1,408,013 m$^2$).

There is no predicted additional footprint to the end of the next 12 month period (2013-2014) as a result of planned Phase 1 works. As mentioned previously, during the next twelve month period, IMX/TR plans to continue their assessment into the feasibility of the Phase 2 resource. The addition of the Phase 2 resource to the Project would trigger the need to update the existing MARP (to be referred to as the PEPR) and there would be an expected additional footprint and associated adjustment to the SEB for the Project.

A plan showing the current and proposed (nil) disturbance areas for the next 12 months is shown in Figure 5.

**Table 6: Project footprints and operations summary (Phase 1)**

<table>
<thead>
<tr>
<th>Project Area</th>
<th>Total predicted Project footprint (revised Jan 2011)</th>
<th>Actual footprint at last reporting period (2011-2012) (m$^2$)</th>
<th>Actual footprint at current reporting period (2012-2013) (m$^2$)</th>
<th>Predicted additional footprint for next reporting period (2013-2014) (m$^2$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste Dumps</td>
<td>496,630</td>
<td>457,500</td>
<td>482,900</td>
<td>-</td>
</tr>
<tr>
<td>ROM Pad</td>
<td>118,700</td>
<td>90,000</td>
<td>125,250</td>
<td>-</td>
</tr>
<tr>
<td>Laydown Pad</td>
<td>90,223</td>
<td>77,920</td>
<td>77,920</td>
<td>-</td>
</tr>
<tr>
<td>Explosives Storage</td>
<td>15,000</td>
<td>9,100</td>
<td>9,100</td>
<td>-</td>
</tr>
<tr>
<td>Site Roads &amp; Portion of Site Access Road</td>
<td>218,500</td>
<td>233,800</td>
<td>233,800</td>
<td>-</td>
</tr>
<tr>
<td>Pit 1</td>
<td>198,960</td>
<td>230,000</td>
<td>230,000</td>
<td>-</td>
</tr>
<tr>
<td>Pit 2</td>
<td>270,000</td>
<td>93,310</td>
<td>93,310</td>
<td>-</td>
</tr>
<tr>
<td>Surface Water Bund</td>
<td>NA</td>
<td>27,770</td>
<td>27,770</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,408,013</strong></td>
<td><strong>1,219,400</strong></td>
<td><strong>1,280,050</strong></td>
<td>-</td>
</tr>
</tbody>
</table>

*Note: In the 2011-2012 MARCR, an estimated total footprint for Phase 1 of 1,127,288 m$^2$ was reported. This has since been estimated more accurately using the surveyed footprints of mine infrastructure and area estimation performed using GIS software (MapInfo).
6. Compliance with Outcomes

6.1 Review of Non-compliance for 2011-2012

The non-compliances (and assessment criteria) identified for the previous 2011-2012 reporting period are summarised below:

- **Surface Water:**
  - Compliance with *Surface Water Management Plan*.
  - Demonstrate water channel profiles pre and post mining show that pre mining water flow regimes are re-established post mining.
  - Records of inspection of fuel, oil and chemical containment areas.

- **Land Management and Land Use:**
  - Records of inspection of fuel, oil and chemical containment areas.

No instances of non-compliance with the outcomes or Lease conditions were noted for the Project by DMITRE during the 2011-2012 reporting period. There were also no instances of non-compliance reported during the previous period (2010-2011).

6.2 Statement of Compliance for 2012-2013

Table 7 (see over) lists the outcomes, control and management measures and assessment criteria of the current approved MARP and Lease conditions for the Project. For each outcome listed, TR has made an assessment of whether the operations were compliant or non-compliant during the current reporting period.

For each statement of compliance, TR has provided a summary of measurement data that demonstrates the conclusion that the outcome was (or was not) fully achieved. To aid interpretation and to avoid data overload, TR has not provided detailed raw data or reports here, however additional information may be available to the reader on request.
### Table 7: Compliance with Outcomes Assessment

<table>
<thead>
<tr>
<th>Issue (outcome) (as per MARP)</th>
<th>Summary of control and management measures</th>
<th>Assessment criteria</th>
<th>Compliant or non-compliant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flora</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Objective:</strong> To maintain the regional abundance, diversity and productivity of vegetation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No significant adverse impact on the abundance and diversity of threatened or non-threatened native flora species as a result of mining operations.</td>
<td>- Defined areas for vegetation clearance (disturbance).&lt;br&gt;- Native Vegetation Management Plan.&lt;br&gt;- Dust Management Plan.&lt;br&gt;- Restriction of traffic movements.&lt;br&gt;- Ongoing surveys at nominated 'control' and 'impact' locations to identify changes in composition and abundance of flora species.&lt;br&gt;- No application of saline water outside of the 'cleared areas'.</td>
<td>- Clearance not to occur outside of the areas shown in Figure 1.2 – Mining Lease Area (in the MARP) and not to exceed clearance footprint shown in Table 5.2 – Project Components and Footprints (in the MARP).&lt;br&gt;- Ongoing surveys at nominated locations to identify changes in composition and abundance of flora species.</td>
<td><strong>Compliant</strong>&lt;br&gt;- 128.005 ha cleared to date within proposed total footprint (Phase 1). DMITRE approved revised total footprint is 140.8 ha.&lt;br&gt;- Monitored the progress of previous rehabilitation activities in decommissioned areas.&lt;br&gt;- Monitored condition of <em>Pittosporum</em> seedlings planted along Engenina Creek line.</td>
</tr>
<tr>
<td>(CH_001, CH_002, CH_003, and CH_004)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issue (outcome) (as per MARP)</td>
<td>Summary of control and management measures</td>
<td>Assessment criteria</td>
<td>Compliant or non-compliant</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------------------------------------</td>
<td>---------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td></td>
<td>Adherence to the <em>Dust Management Plan</em>, including the proposed management and mitigation measures:</td>
<td>Compliant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- mine traffic to remain on formed roads and tracks within the mining areas</td>
<td>• All personnel were inducted prior to entry to Site. Induction includes emphasis on the need to remain on formed roads and within speed limits.</td>
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<td>- clearing to be undertaken immediately prior to development to minimise the time of exposure of cleared land</td>
<td>• Only areas that need to be cleared for mine development purposes have been cleared. All areas that needed to be cleared were cleared immediately prior to development (e.g. ROM pad extension).</td>
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<td>- stabilisation of disturbed areas using water.</td>
<td>• Minimum of 1 water truck continuously (7 am to 6 pm) watering all disturbed areas to minimise dust generation and road and pad degradation.</td>
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| No increase in the weeds and plant pathogens as a result of mining operations. (CH_005) | • Weed and Pest Management Plan.  
• Implement ongoing inspection for weeds.  
• Implement weed awareness as part of the Site induction.  
• Implement eradication plan if weeds identified.  
• Complaints register. | • Compliance with Weed and Pest Management Plan, with adherence to the following weed management activities:  
- inspection of mine area for the presence of weeds  
- all interstate or higher risk vehicles or equipment shall be checked and cleaned prior to commencing work  
- all vehicles will be required to remain on formed roads and tracks within the mining project area  
- regular inspections of areas surrounding mining operations to identify any new weeds. | Compliant  
• Autumn (April) 2012 and Spring (November) surveys conducted, including weed and pest monitoring.  
• No weed species requiring control (declared weeds) under the NRM Act were recorded during the surveys conducted.  
• Small infestation of Saffron Thistle plants from an area adjacent to site IMP001 were removed and destroyed off-Site with ongoing monitoring to occur during next reporting period.  
• Small infestation of Buffel grass near the Rail Siding is to be sprayed in mid-2013 with ongoing monitoring.  
• Establishment of a wild dog baiting program and destruction of rabbit warrens near the Rail Siding.  
• All interstate or higher risk plant / vehicles checked and cleaned prior to entering the Site (Vehicle Inspection Checklists completed). All plant / vehicles arriving to Site from interstate inspected on highway prior to authorisation to proceed to Site.  
• All personnel instructed to remain on formed roads during induction process. |
| | | • Complaints register (containing register relating to weeds issues) with associated actions / responses to demonstrate all reasonable complaint(s) are addressed. | Not applicable to date  
• No weed species requiring control (declared weeds) under the NRM Act were recorded during the surveys conducted.  
• Compliance register yet to be implemented as no complaints have been received to date. |
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<tbody>
<tr>
<td>Fauna</td>
<td>Objective: To maintain the regional abundance, diversity and productivity of fauna.</td>
<td>No significant adverse impact on the abundance and diversity of threatened or non-threatened native fauna species, as a result of mining operations.</td>
<td>Compliant</td>
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<td></td>
<td>Implementation and adherence to a Fauna Management Plan.</td>
<td>Clearance not to occur outside of the areas shown in Figure 1.2 – Mining Lease Area (in the MARP) and not to exceed clearance footprint shown in Table 5.2 – Project Components and Footprints (in the MARP).</td>
<td>128.005 ha cleared to date within proposed total footprint (Phase 1). DMITRE approved revised total footprint is 140.8 ha.</td>
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| Includes impacts associated with reduced habitat, noise and vibration, entrapments or barriers to movement, traffic collisions. (CH_006, CH_007, CH_008, CH_009 and CH_010) | • Compliance with *Fauna Management Plan*, with adherence to the following proposed management and mitigation measures:  
  - no driving off mine management roads unless authorisation received by TR  
  - mine excavation areas to be inspected regularly to identify existence of potentially trapped fauna  
  - maintenance of site fencing to avoid, minimise and manage impacts associated with grazing animals  
  - adherence to waste management procedures to reduce potential food sources for introduced pests and vermin  
  - monitor and implement pest trapping and management as may be required. | Compliant  
  • Excavated areas including borrow pits and turkey nest dams are inspected regularly for trapped fauna.  
  • All turkey nest dams have been fenced to mitigate risks to native fauna and grazing stock and these are also regularly inspected and maintained (as required).  
  • Establishment of a wild dog baiting program has occurred and is ongoing.  
  • A detailed *Waste Management Plan* was implemented during the period to improve waste management practices.  
  • All food scraps and office wastes are stored in lidded bins or skips and removed weekly by a contractor.  
  • All personnel instructed to remain on formed roads during induction process. |
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|                             | Ensure equipment complies with relevant noise standards. | Compliant | • No significant, permanent man-made noise sources are located near the Project area. The nearest sensitive noise receptor to the mining operation is now Arrium’s ‘Windy Valley’ village which is located approximately 24 km south-west of the Project, a distance which is well in excess of any recommended separation distances in the EPA Guidelines.  
• Therefore, it is determined that there is no need to undertake regular monitoring of noise levels. In regards to native fauna, the affect to native fauna levels will be determined by annual fauna surveys undertaken by consultants. |
|                             | Results of monitoring program show no statistically significant differences (increase or decrease) in native vertebrate density and diversity compared with the local area. | Compliant | • Fauna monitoring sites established for long-term monitoring of impact sites (close to development area) and control sites (approximately 5 km from impact area) allowing comparison of any differences in vertebrate density and diversity.  
• Autumn (April) 2012 and Spring (November) 2012 surveys conducted.  
• Full trend analysis of the data is not warranted to date, however this may be conducted following the Spring 2013 monitoring. |
|                             | Results of monitoring program show no statistically significant differences (increase or decrease) in introduced vertebrate density and diversity compared with the local area. | Compliant | • As above.  
• Wild dog baiting program commenced. |
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<td></td>
<td>• Ongoing fauna monitoring and observation to determine changes in abundance of fauna species.</td>
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<td>Compliant • As above.</td>
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<tr>
<td><strong>Groundwater</strong></td>
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<tr>
<td><strong>Objective:</strong> To ensure that extraction and use of groundwater does not adversely affect environmental values, existing users or the health and amenity of people.</td>
<td>• Water supply bores are a significant distance from Southwest Springs zone boundary and the main flow area of the GAB.</td>
<td>• Demonstrate that there are no impacts to the GAB springs due to the Project water extraction.</td>
<td><strong>Compliant</strong></td>
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<td></td>
<td>• Adhere to Groundwater Management Plan.</td>
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<td>• Agreement in place with pastoralist in the event that water in the Solar Bore is impacted.</td>
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<td>• Demonstrate ground water levels / drawdown, as measured, do not exceed Water Licence conditions.</td>
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<td><strong>Compliant</strong></td>
<td>• Surveys and research conducted (see Habermehl 1980; Habermehl and Lau 1997) indicate the GAB is 80+ km north east of Cairn Hill, and not within the important water resources of the GAB proper.</td>
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<td>• Groundwater levels investigated in 2006 and 2007 (PB 2007a and 2007b).</td>
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<td>• TR personnel continued to collect monthly water level and water quality (EC, Temperature and pH) data for Solar Bore and other required bores in accordance with GMP.</td>
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<td>• A groundwater sampling event was conducted in October-November 2012, with groundwater samples collected from required bores sent for analysis to NATA accredited laboratories.</td>
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<td></td>
<td>• Annual Water Use Report for 2011-2012 was submitted to DEWNR. Results show that drawdown of SWLs and readings for EC (TDS) and pH for required bores are within the parameters set out in the GMP and Water Licence conditions.</td>
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<td>• The revised Groundwater Monitoring Program was approved by DEWNR.</td>
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<td></td>
<td>• Monitoring of groundwater in Solar Bore (in accordance with <em>Groundwater Management Plan</em>).</td>
<td>Compliant&lt;br&gt;• TR personnel continued to collect monthly water level and water quality (EC, Temperature and pH) data for Solar Bore in accordance with GMP.&lt;br&gt;• A groundwater sampling event was conducted in October-November 2012, with groundwater samples collected from Solar Bore and sent for analysis to NATA accredited laboratories.&lt;br&gt;• Results of Solar Bore analysis communicated to landholder (SA Property).&lt;br&gt;• Annual Water Use Report for 2011-2012 submitted to DEWNR. Results for Solar Bore show that drawdown of SWL and readings of EC (TDS) and pH are within the parameters set out in the GMP and Lease conditions.</td>
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<td></td>
<td>• Measures identified in agreement with pastoralist to be implemented if groundwater in Solar Bore is impacted.</td>
<td>Compliant&lt;br&gt;• On-going liaison with pastoralist and landholder (SA Property). Meetings were convened on a monthly basis with the previous pastoralist and continue to be convened on an ‘as needs’ basis with the new owners, however continuous contact is maintained, generally via email. All aspects of the agreement discussed and the pastoralist invited to raise any concerns they may have had. Good relationship with the new owners is well established.</td>
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<tr>
<td><strong>Surface Water</strong></td>
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<td><strong>Objective:</strong></td>
<td>To maintain the pre-mining quality and flow of surface watercourses so that environmental values are protected.</td>
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<tr>
<td>No long term effects on aquatic fauna and flora due to altered flow regimes (CH_013)</td>
<td>• Adherence to <em>Surface Water Management Plan</em>.</td>
<td>• Compliance with <em>Surface Water Management Plan</em>.</td>
<td>Compliant</td>
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<td>• Design (as required) post mining water channels to re-establish flow regimes post mining.</td>
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<td>• Inspection of surface water flows after rain events.</td>
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<td>Requirements of the <em>Surface Water Management Plan</em> were met, including inspection of surface water flows after rain events.</td>
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<td>Following the February/March 2012 significant rainfall event, surface water and bed sediment samples were collected from selected locations within Engenina Creek and an Annual Surface Water and Bed Sediment Sampling Report was produced in June 2012.</td>
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<td>TR engaged a surface water engineering consultant (Southfront) to review and assess the flood risks of the mine. This included modelling surface water flows and providing concept designs for upgrade of safety and containment bunds, while maintaining surface water flows in Engenina Creek (completed October 2012).</td>
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<td>The surface water bund between Pit 2 and the Southern waste dump has been upgraded to provide a greater level of protection.</td>
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<td>A more detailed <em>Surface Water Management Plan</em> was developed and a WAA permit application has been submitted to DEWNR for proposed Phase 2 works (currently under assessment).</td>
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<tr>
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|                               | • Concentration of water contaminants and contaminants in bed sediments to comply with ANZECC / ARMCANZ (2000) water and sediment quality guidelines. | • Selected major channels of Engenina Creek were inspected for signs of erosion, sediment deposition and water flow after the significant rainfall event (>60 mm) in February-March 2012 and an Annual Surface Water and Bed Sediment Sampling Report was produced in June 2012.  
• Surface water and bed sediment samples were collected from 8 selected locations (4 ‘control’ and 4 ‘impact’ locations) and samples sent to NATA accredited laboratories for analysis. Comparison of analytical results against relevant assessment criteria for the protection of fresh water ecological systems was performed and a brief report produced.  
• Results show no evidence of adverse impacts on aquatic fauna and flora due to altered surface water flow regimes, the generation and release of sediment or ARD from mine operations, or the release of fuels and/or chemicals.  
• There is no discernible difference between chemical results at ‘control’ versus ‘impact’ locations for both surface water and bed sediment samples.  
• There were no significant rainfall events during the 2012-2013 reporting period where surface water flow was observed within Engenina Creek. | Compliant |
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</table>
| No long term effects on aquatic fauna and flora due to acid rock drainage (ARD) (CH_014) | • Design and construct ore pads to be low permeability and waste dumps to encapsulate PAF.  
• Ore and waste rock will be stored on low permeability storage pads and potentially acid forming (PAF) waste rock will be encapsulated.  
• Leaching tests to determine AFR potential of stockpiles. | • Compliance with the design requirements for ARD management. | Compliant |
| | | • Demonstrate water channel profiles pre and post mining show that pre mining water flow regimes are re-established post mining. | Compliant |
| | | • TR engaged a surface water engineering consultant (Southfront) to review and assess the flood risks of the mine. This included modelling surface water flows and providing concept designs for upgrade of safety and containment bunds, while also maintaining surface water flows in Engenina Creek (completed October 2012).  
• A more detailed Surface Water Management Plan was developed and a WAA permit application has been submitted to DEWNR for proposed Phase 2 works (currently under assessment).  
• Comparison of aerial photographs and surveyed data will provide assessment of whether the pre mining water flow regimes are re-established post mining. | |
| | | • TR personnel continue to monitor and collect water quality and gas data and perform leaching tests for PAF when favourable environmental conditions exist (e.g. hot and humid weather).  
• No signs of acid generation were observed during the reporting period.  
• Where identified, PAF rock was encapsulated within the waste rock dumps and records kept. | |
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<tr>
<td></td>
<td>• Inspection of surface water flows after rain events.</td>
<td>Compliant</td>
<td>• Inspection of ore stockpiles was undertaken after rainfall events and water quality data (pH) was recorded.</td>
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<td></td>
<td>• Inspection of ore stockpiles was undertaken after rainfall events and water quality data (pH) was recorded.</td>
<td></td>
<td>• Selected major channels of Engenina Creek were also inspected for signs of erosion, sediment deposition and water flow after the significant rainfall event (&gt;60 mm) in February-March 2012.</td>
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<tr>
<td></td>
<td>• Selected major channels of Engenina Creek were also inspected for signs of erosion, sediment deposition and water flow after the significant rainfall event (&gt;60 mm) in February-March 2012.</td>
<td>See above.</td>
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<td></td>
<td>• Concentration of water contaminants and contaminants in bed sediments to comply with ANZECC / ARMCANZ (2000) water and sediment quality guidelines.</td>
<td>Compliant</td>
<td>• Inspection of ore stockpiles was undertaken after rainfall events and water quality data (pH) was recorded, with comparisons made against relevant assessment criteria (SA EPP and ANZECC / ARMCANZ).</td>
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<td></td>
<td>• Surface water and bed sediment samples were collected from 8 selected locations (4 ‘control’ and 4 ‘impact’ locations) in Engenina Creek and samples sent to NATA accredited laboratories for analysis. Comparison of analytical results against relevant assessment criteria for the protection of fresh water ecological systems was performed and a brief report produced.</td>
<td></td>
<td>• Surface water and bed sediment samples were collected from 8 selected locations (4 ‘control’ and 4 ‘impact’ locations) in Engenina Creek and samples sent to NATA accredited laboratories for analysis. Comparison of analytical results against relevant assessment criteria for the protection of fresh water ecological systems was performed and a brief report produced.</td>
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<td>• Results show no evidence of adverse impacts on aquatic fauna and flora due to altered surface water flow regimes, the generation and release of sediment or ARD from mine operations, or the release of fuels and/or chemicals.</td>
<td></td>
<td>• Results show no evidence of adverse impacts on aquatic fauna and flora due to altered surface water flow regimes, the generation and release of sediment or ARD from mine operations, or the release of fuels and/or chemicals.</td>
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<td></td>
<td>• Where identified, PAF rock was encapsulated within the waste rock dumps and records maintained.</td>
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| No long term effects on aquatic fauna and flora due to release of fuel and / or chemicals. (CH_015) | • Implement procedures and training to ensure refuelling to be undertaken in accordance with industry best practice and any spills attended to immediately.  
• Fuel / chemical / oil storage in accordance with guidelines, maintained and inspected to ensure integrity, good housekeeping and correct use of the area.  
• Records of inspections of fuel, oil and chemical containment areas.  
• Measure and record amount of contaminated material removed from individual sites. | • Demonstrate adherence to industry best practice and guidelines. | Compliant  
• All personnel were inducted prior to entry to mine Site. Induction includes MSDS and chemical register requirements.  
• Adequate training of personnel using or decanting chemicals is carried out using appropriate procedures (by the Contractor)  
• All appropriate MSDS are kept on Site (by the Contractor), storages are labelled appropriately and a register is maintained.  
• A detailed Site Contamination Management Plan (SCMP) has been developed for managing site contamination issues in general accordance with currently accepted industry standards and guidelines. Implementation and training is ongoing.  
• As a result of inspections of hydrocarbon storages, some secondary containment (spill pallets) for temporary storages (such as diesel IBCs) were identified as being inadequate. These were replaced with larger spill pallets with a volume of 130% of the net capacity of the largest storages.  
• Dangerous goods are stored appropriately. The main diesel storage on Site is within a self bunded tank and smaller quantities of flammable and combustible liquids are stored appropriately within spill containment facilities. |
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<tr>
<td>Compliant</td>
<td>Surface water and bed sediment samples were collected from 8 selected locations (4 ‘control’ and 4 ‘impact’ locations) and samples sent to NATA accredited laboratories for analysis. Comparison of analytical results against relevant assessment criteria for the protection of fresh water ecological systems was performed and a brief report produced. Results show no evidence of adverse impacts on aquatic fauna and flora due to altered surface water flow regimes, the generation and release of sediment or ARD from mine operations, or the release of fuels and/or chemicals. There is no discernible difference between chemical results at ‘control’ versus ‘impact’ locations for both surface water and bed sediment samples.</td>
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• Concentration of water contaminants and contaminants in bed sediments to comply with ANZECC / ARMCANZ (2000) water and sediment quality guidelines.
### Land Management and Land Use

**Objective:** To ensure that impacts to land management and land use are kept as low as reasonably practicable.

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<tr>
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</table>
| No long term impacts to soil quality due to spills of fuel, oil or chemicals during mining operations. (CH_016) | • Implement procedures and training to ensure refuelling to be undertaken in accordance industry best practice and any spills attended to immediately.  
• Fuel / chemicals / oil storage in accordance with guidelines, maintained and inspected to ensure integrity, good housekeeping and correct use of area.  
• All MSDS on Site and up to date. | • Demonstrate adherence to industry best practice and guidelines. | **Compliant**  
• All personnel were inducted prior to entry to mine Site. Induction includes MSDS and chemical register requirements.  
• Adequate training of personnel using or decanting chemicals is carried out using appropriate procedures.  
• All appropriate MSDS are kept on Site (by the Contractor) and a register is maintained.  
• A detailed *Site Contamination Management Plan* (SCMP) has been developed for managing site contamination issues in general accordance with currently accepted industry standards and guidelines. Implementation and training is ongoing.  
• Records of inspections of fuel, oil and chemical containment areas. | **Compliant**  
• During February 2013, TR environmental staff undertook an inspection of all fuel, oil and chemical containment areas across the Site with the assistance of EMS safety and maintenance staff.  
• Recommendations for improvement have been made and a follow-up investigation is planned for 2013-2014. |
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| No long term impacts to soil quality due to leakages from water supply pipelines. (CH_017) | • Adherence to Land Management Plan.  
• Design water pipelines to eliminate leakage.  
• Implement procedures for pipeline inspection. | • Concentration of contaminants in soils in compliance with NEPC soil investigation criteria.  
  • A detailed Site Contamination Management Plan (SCMP) has been developed for managing site contamination issues, including the sampling and assessment of impacted soils (arising from chemical spills).  
  • Bed sediment samples were collected from 8 selected locations (4 ‘control’ and 4 ‘impact’ locations) in Engenina Creek and samples sent to NATA accredited laboratories for analysis. Comparison of analytical results against relevant assessment criteria (including NEPC) for the protection of fresh water ecological systems was performed and a brief report produced.  
  • Results show no evidence of adverse impacts on aquatic fauna and flora due to altered surface water flow regimes, the generation and release of sediment or ARD from mine operations, or the release of fuels and/or chemicals. | Compliant  
  • Weekly inspection of water supply pipelines undertaken by TR personnel and records maintained.  
  • Condition of water supply pipelines maintained during the period.  
  • Repair water leaks as identified.  
  • Repair and stabilise landform scours / washouts / erosion.  
  • Concentration of contaminants in soils in compliance with NEPC soil investigation criteria.  
  • No water leaks to date.  
  • No erosion to date.  
  • No water leaks to date. |
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<tr>
<td><strong>Indigenous and Non-Indigenous Heritage</strong>&lt;br&gt;&lt;strong&gt;Objective:&lt;/strong&gt; To ensure that changes to the biophysical environment do not adversely affect historical and cultural associations.&lt;br&gt;Aboriginal sites of scientific, mythological and cultural significance are protected or lawfully removed with consent of the native title claimants, and reported in accordance with statutory requirements (under the Aboriginal Heritage Act 1988).&lt;br&gt;(CH_018)</td>
<td>• Cease work and consult with Antakirinja native title claimants in event of discovery of aboriginal sites/relics.&lt;br&gt;• Statutory reporting of discoveries in accordance with the Aboriginal Heritage Act 1988 (SA).&lt;br&gt;• Long term contractors will be informed regarding indigenous and non-indigenous cultural history aspects of the operations and obligations if a site is uncovered.</td>
<td>• Demonstration of consultation with the native title claimants and statutory reporting in the event that a suspected Aboriginal site / relic is discovered.</td>
<td>Compliant&lt;br&gt;• The Project area is located within the Antakirinja Matu-Yankunytjatjara Aboriginal Corporation (AMYAC) native title area. The AMY people became recognised as Native Title holders (i.e. Traditional Owners) of the area on the 11 May 2011 through a consent determination.&lt;br&gt;• A Native Title Mining Agreement (NTMA) between TR and AMYAC (then ALMAC) was executed in March 2008. Prior to the native title consent determination in May 2011, part of the ML was subject to native title claims by both AMYAC and the Arabana People in an “overlap” area. However the overlap area has since been resolved and it is now entirely held by AMYAC.&lt;br&gt;• No suspected aboriginal sites or relics discovered to date.&lt;br&gt;• Site Induction includes instruction on the procedure to follow in the event that a relic or possible Aboriginal site is discovered.</td>
</tr>
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7. Rectification of Non-compliance

This Section summarises the activities undertaken during the reporting period (2012-2013) to rectify non-compliances identified from the previous year. Non-compliances for the current reporting period (2012-2013) are also summarised along with environmental incidents and complaints received.

7.1 Non-compliance for 2011-2012

TR identified areas of non-compliance during the 2011-2012 reporting period relating to surface water and land management / land use. The key areas (and assessment criteria) are identified below along with the methods of rectification and the progress of activities over the previous year.

Surface Water

Assessment criterion: Compliance with Surface Water Management Plan.

- In April 2012, TR engaged a surface water engineering consultant (Southfront) to assess the flood risks for the Cairn Hill mine and a final report was issued in October 2012. The work included modelling the surface water movement through the mine area and providing concept designs for suitable flood protection for infrastructure (to a minimum of a 1 in 100 year flood event). Different concept designs were developed to select a design with minimal impact on the natural flow regimes while also maintaining sufficient flood protection for the mine operations.
- An updated and more detailed Surface Water Management Plan (SWMP) has now been implemented for the Site.
- Surface water courses (selected major channels of Engenina Creek) are inspected annually for signs of erosion, sediment deposition and water flow. This generally occurs opportunistically once a year after a significant (>20 mm) rainfall event where surface water flow is observed in the channels of Engenina Creek. At this time, surface water and bed sediment sampling is also performed as part of our MARP commitment. This was conducted in March 2012 for selected locations following the February/March rainfall event and an Annual Surface Water and Bed Sediment Sampling Report was produced in June 2012.
- TR considers that it is now compliant in this area.

Assessment criterion: Demonstrate water channel profiles pre and post mining show that pre mining water flow regimes are re-established post mining.

- The concept designs presented in the Southfront (2012) report were developed with the dual purpose of selecting a design with minimal impact on the natural flow regimes while also maintaining sufficient flood protection for the mine operations.
- An orthophotograph of the Site was captured in September 2011 and survey data for the operations is continually updated. Comparison of aerial photographs and surveyed data over time will provide assessment of whether the pre mining water flow regimes are established post mining.
Assessment criterion: Records of inspection of fuel, oil and chemical containment areas.

- During February 2013, TR environmental staff undertook an inspection of all fuel, oil and chemical containment areas across the Site with the assistance of EMS safety and maintenance staff.
- During the inspection, staff working in each area were asked about the types and locations of chemicals stored within those areas. Where chemicals were stored correctly, this was communicated to staff at the time and where improvements could be made immediately these were also discussed with staff at the time of the inspection.
- Photographic records were taken and an electronic database was created to help track the chemical storage locations, chemical types, approximate volumes, storage vessel types and secondary containment (if present) as well as signage present.
- Comments relating to the inspection have been passed on to the relevant Site personnel and recommendations for improvement (where necessary) have also been communicated for follow-up action.
- A follow-up inspection is planned during the next reporting period (within the next 6 months).
- TR considers that it is now compliant in this area.

Land Management and Land Use

Assessment criterion: Records of inspection of fuel, oil and chemical containment areas.

- As above for the surface water criterion.
- TR considers that it is now compliant in this area

7.2 Non-compliance for 2012-2013

There are no non-compliances identified for the current reporting period in the Compliance with Outcomes Assessment above (see Table 7). Due to the work undertaken by TR in rectifying non-compliances from last year, TR considers that it is now compliant in all areas related to the outcomes and Lease conditions.

No instances of non-compliance with the outcomes or Lease conditions were noted for the Project by DMITRE during the 2012-2013 reporting period. There were also no instances of non-compliance reported during the previous period (2011-2012).

7.3 Environmental Incidents

Environmental incidents occurring at the Site are captured under the Cairn Hill Safety Management System and recorded in the Incident Register maintained by the Contractor (EMS). A total of 56 incidents were recorded during the 2012-2013 reporting period, eight of which were classed as primarily environmental in nature.

Of the eight environmental incidents captured, four were for chemicals spills. Three of these related to minor chemical spills (<100 L) occurring on the ROM pad at the Site (hydraulic oil and diesel). One of these was a major diesel spill (approximately 200-300 L) which occurred in May 2012 near the Rail Siding when SCT train operators were refuelling. Clean-up of diesel spills within the rail corridor are the responsibility of the
rail contractor (SCT). TR will however monitor the progress of clean-up activities over the next reporting period and provide assistance where possible. The remaining minor chemical spills on Site have been cleaned up by TR.

The remaining four environmental incidents were related to animal collisions. Three of these were livestock (cattle) deaths on the Haul Road as a result of collision with road trains. Where this has occurred, the pastoralist (SA Property) has been financially compensated for the livestock at relevant market rates. The other animal collision was a kangaroo strike by a light vehicle travelling to work on the Stuart Highway.

7.4 Complaints

No complaints have been received by TR to date for the Project. A Complaints Register will be established when required.
8. Management Systems Review

8.1 Overview

Management systems for the Cairn Hill Project are supported by the organisational Risk Management Strategy developed by IMX. IMX has established an Audit and Risk Management Committee (ARMC) to assist the Board in fulfilling its statutory and fiduciary responsibilities. The ARMC meets at least twice per year, or more regularly as required, to review company risks and advise management accordingly. The ARMC ensures that IMX management has established and operates a financial risk management system which is designed to identify, assess, monitor and manage financial risk. In addition to financial risk, the ARMC also considers other external risks and those associated with the operations such as health, safety and environmental risks.

Specifically for the Cairn Hill Project, TR also operates the Cairn Hill Safety Management System (SMS). This is a valuable tool for personnel in managing the health and safety risks for workers at the Site as well as risks in the areas of environment, administration, geology, mining and surveying. The Cairn Hill SMS includes six sub-sections (folders) as follows:

1) Health and Safety
2) Environment
3) Administration
4) Geology
5) Mining
6) Survey

These six sub-sections cover the range of operational activities undertaken at the Site. Within each sub-section are the relevant policies, procedures, documents and forms necessary to carry out the operations in a safe, responsible and efficient manner.

TR’s management systems are supported by those of the contractor (EMS). EMS has developed their own management systems for the Project, including policies, standard operating procedures (SOPs), management plans and forms. These documents have been reviewed and approved by TR.

All staff and contractors working on the Project are encouraged and expected to participate in the identification and management of health, safety and environmental risks. This includes the reporting of near misses, safety hazards and incidents to Site Management. An incident management system (Cairn Hill Incident Register) has been established for the Project to document reported incidents, investigate root causes and develop corrective actions with assigned responsibilities. Specific incidents related to the environment (e.g. chemical spills) are reported to DMITRE annually in the MARCRs. Major environmental incidents will be reported to the SA EPA as soon as possible after the incident. Safety incidents are also reported to SafeWork SA and DMITRE as required by legislation.

As IMX/TR continues to grow and evolve, a more comprehensive system for managing risk is likely to be developed. This may include further development and refinement of the following management systems:
• Quality Management System in accordance with ISO 9001:2008;
• Occupational Health and Safety System in accordance with AS/NZS 4801; and

8.2 Management Systems Audit

In early 2013, TR engaged an independent consultant (MACCS Group) to complete a work health and safety compliance review for the Cairn Hill operations. The review consisted of both a field review component conducted on-Site as well as a desktop review of the TR Safety Management System based on the requirements of the South Australian Work Health and Safety Act and Regulations 2012.

The field review considered the minimum requirements for legislative requirements and best industry practice and was made up of two parts:

• Part 1: Physical Inspection – to verify conformance with standard industry practices; and
• Part 2: Review of applicable systems of work in operation on the day of review – to measure capacity to meet the criteria.

The desktop review process consisted of a detailed analysis of the TR Safety Management System and how it is designed to be applied throughout the organisation.

MACCS Group reported from their field review that standards observed whilst on Site were above average. The desktop review revealed that the SMS is reasonably well structured and reflects aspects of the minimum elements of the Regulations of Chapter 10 Mines Part 1 – Mining work. There have been some key recommendations drawn from the review process and identified to TR. These recommendations will now be carefully assessed by TR over the next reporting period and changes implemented where necessary and appropriate.

There were no other reviews of management systems conducted during the reporting period.

8.3 Reviews of Plant, Equipment, Infrastructure and Other Facilities

DMITRE expect major items of plant or equipment to be reviewed at least once every five years. As activities at Cairn Hill have not reached or exceeded five years, no reviews have been conducted to date.

Exact Mining Services employs a full-time maintenance team responsible for the maintenance of all plant, equipment, infrastructure and other facilities on Site. During the reporting period 2012-2013, a number of plant / equipment movements to the Cairn Hill Site were tracked by EMS. Many of these movements included smaller items such as compressors, trailers, fridges and pumps. All of these pieces of plant / equipment were checked for serviceability prior to entering the Site and records of these checks have been entered into the maintenance logs kept with each piece of plant / equipment.
9. New Environmental Hazards

There were no new environmental hazards or risks identified during the conduct of operations in the 2012-2013 reporting period.

Although not a new hazard or risk to the Project, surface water flooding risk was identified in 2011-2012 as requiring increased consideration and action. TR has now addressed this risk as discussed in Section 7.1.

The proposed Cairn Hill Phase 2 operations essentially represent an increase in production of a known resource (primarily magnetite) on the existing ML. Existing Site infrastructure (such as Site access roads, haul road, waste dumps and Site offices) will be utilised where possible to minimise the Project footprint and environmental impact. During the next 12 months, IMX/TR plans to continue their assessment into the feasibility of the second phase resource (Phase 2), located immediately to the east of Phase 1. The addition of the Phase 2 resource to Cairn Hill would trigger the need to update the existing MARP (to be referred to as the PEPR) for the Project in consultation with DMITRE and other stakeholders.
10. Environmental Protection and Biodiversity Conservation (EPBC) Act Reporting

The Cairn Hill Project is not subject to approval under the Environment Protection and Biodiversity Conservation Act 1999 as it is not a controlled action. This decision was made by the Commonwealth Department of the Environment, Water, Heritage and the Arts on 6 May 2008 after consideration of the EPBC Act Referral Cairn Hill Project SA, dated 28 March 2008 (PB, 2008a).

The nationally vulnerable Plains Mouse (*Pseudomys australis*), a mammal species listed under the EPBC Act, was caught during surveys conducted in the 2012-2013 reporting period. This species was also detected in previous surveys conducted in the period 2010-2012. One bird species of conservation significance, the nationally vulnerable Thick-billed Grasswren (*Amytornis textilis modestus*), was also observed during surveys conducted in the 2012-2013 reporting period. This species was also detected in previous surveys conducted in the period 2010-2012. These two species may be resident to the area and their abundance and distribution is likely to be largely dictated by changing environmental conditions from year to year. They will continue to remain the focus of future monitoring to gauge population abundance and permanence.
11. References


Wood, V & Fitzpatrick, P (2007a). *Work Area Clearance for the proposed Cairn Hill MLA and haul road route*, a report to Goldstream Mining NL (now IMX Resources or Termite Resources NL) and the Antakirinja Matu-Yankunytjatjara Native Title Claimants.

Wood, V & Fitzpatrick, P (2007b). *Work Area Clearance proposed Cairn Hill Mining Lease*, a report to Goldstream Mining NL (now IMX Resources or Termite Resources NL) and the Arabunna People’s Native Title Claimants.

Wood, V & Fitzpatrick, P (2007c). *Work Area Clearance for proposed Cairn Hill haul road route – northern option*, a report to Goldstream Mining NL (now IMX Resources or Termite Resources NL) and the Antakarinja Matu-Yankunytjatjara Native Title Claimants.