

# MINING MANAGEMENT PLAN

## Yalco Project - 2017

Authorisation Number: 0818-01

Operator: **TECK AUSTRALIA PTY LTD** - Level 2/35 Ventnor Ave, West Perth, WA, 6005, Australia. Email: [perth@teck.com](mailto:perth@teck.com)

Project Name: **Yalco\*** - comprising EL25467 and EL29021

Reporting Year: 2017

Tenure Holder: Marindi Metals Ltd., Level 3, 35 Havelock Street, West Perth, WA 6005, Australia. Email: [info@marindi.com.au](mailto:info@marindi.com.au)

Date of submission: September 2017

### Distribution:

- Department of Primary Industry and Resources (Northern Territory)
- Marindi Metals Ltd, Teck Australia Pty Ltd

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*\* Previously named the Batten Creek Project*

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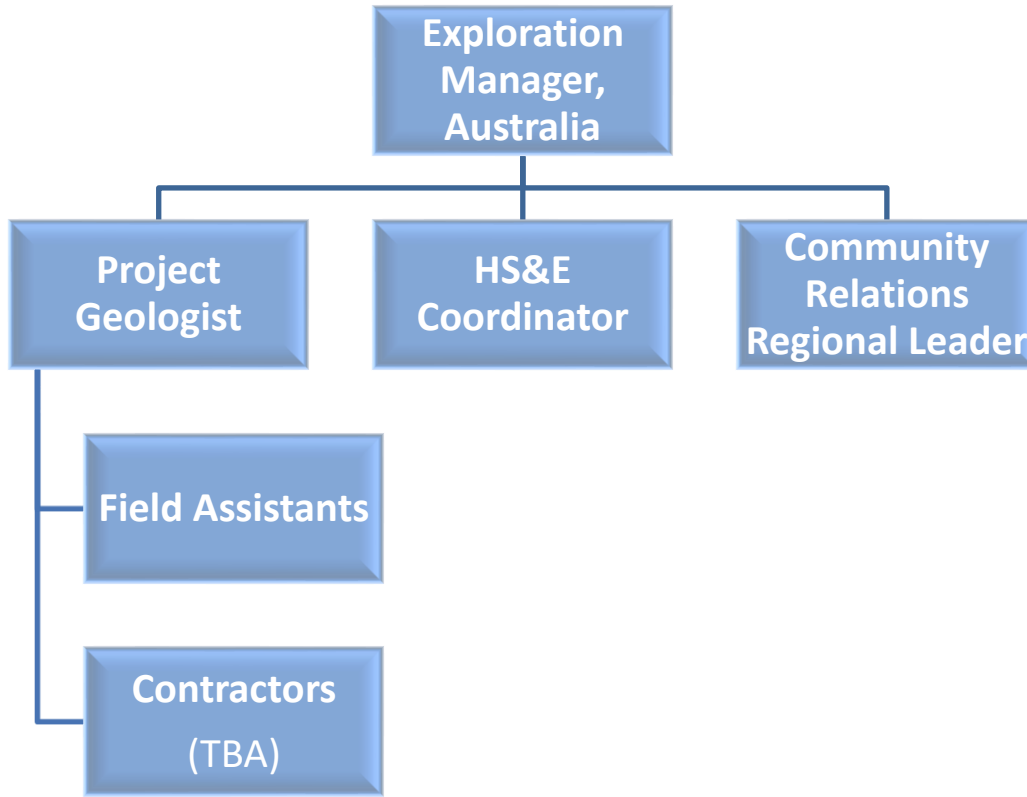
## AMENDMENTS

Section	Amendment	Date

## 1. OPERATOR DETAILS

	Owner	Operator
	Marindi Metals Ltd	Teck Australia Pty Ltd
<b>ABN</b>	84 118 522 124	35 091 271 911
<b>Key Contact Person</b>	Joe Treacy, Managing Director	Mike Taylor, Country Manager, Teck Australia; Susan McKay, Senior Mining Consultant M&M Walter Consulting – 08 9381 5866
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<b>Fax</b>	-	08 9321 4766
<b>Email</b>	<a href="mailto:info@marindi.com.au">info@marindi.com.au</a>	<a href="mailto:perth@teck.com">perth@teck.com</a>

## 5.1 Organisational Structure



## 5.2 Workforce

Teck Australia employs upwards of 10 geoscientists, including a designated Communities officer, and Safety and Environmental manager. Drilling and geophysical work is typically contracted out, with Teck staff acting as contract managers and having overall responsibility for safety and technical matters during the course of the work. Other exploration work is generally carried out by Teck employees.

Estimated staff requirements for the 2017/18 field work are outlined below in the sections describing the work plan, with Teck allocating up to two geologists and two field assistants from the company to the project. These will be supplemented with additional staff (and contractors) if deemed necessary. The contractor drill crew will comprise two drillers and four off-siders working day and night.

During field work, monitors from the appropriate Native Title groups are also employed on a casual basis. Wherever possible, local contractors are preferred, including local field assistants, and earth moving contractors.

## 2. IDENTIFIED STAKEHOLDERS AND CONSULTATION

Teck Australia has in the past maintained close cooperation with McArthur River Station management through the Reward Project (EL10316, EL27541, EL26406, and EL30042), which is to the south of Yalco. Teck discussed scheduled exploration activities for 2016/2017 with the McArthur River Station when field operations affected their pastoral lease. Communication prior to and during exploration activities includes phone calls, email, and face-to-face visits.

Project clearances are conducted through the Aboriginal Areas Protection Authority (AAPA). Teck was issued an AAPA certificate that covered the entire Yalco project in 2015 (C2015\_138). Prior to any ground disturbing activities traditional owners and other community representatives are brought to site to conduct cultural monitoring of affected areas. Selection of cultural monitors is done through consultation with the local community.

Teck operates under EHSC management standards which incorporate a systems based approach to community relations. Teck's professional development framework incorporates community development training and practice opportunities for staff, many of whom have knowledge of "participatory approaches" to community development, and focus on free, prior and informed consent.

At the Yalco project, Teck has undertaken high-level social screening using various local sources including the Northern Land Council and local indigenous families. Teck seeks input to project planning from affected members of the community and has established feedback mechanisms to capture and respond to community concerns (Appendix I). Teck supports local community initiatives and capacity building and will seek to promote additional community benefits as the project advances.

Teck Australia instigates routine consultations with the relevant project stakeholders:

- Northern Land Council (NLC)
- McArthur River station pastoral lease
- Lorella Springs station pastoral lease
- The Alawa, Yanyuwa, Gurdanji and Mara People
- Pandanus Ridge
- Independent anthropologists
- Local indigenous families
- NT Government (Dept. Primary Resources and Energy)
- Department of Natural Resources
- NT Worksafe
- Marindi Metals

## 3. PROJECT DETAILS

The Yalco project is located approximately 675 km southeast of Darwin in the McArthur basin in the Northern Territory. Figure 1 shows the location of the Yalco project and access tracks. Track condition is variable depending upon the season and many areas become waterlogged and boggy during the wet season. Some tracks also have long sandy patches and bull dust develops in some areas. There are three significant watercourses passing through the project: Pine Creek, Galah Creek and Batten Creek.

The nearest sizeable township is Borroloola, which is located approximately 20km from the southeast corner of the project. Borroloola has a permanent population of about 900 people.

Land use in the region is predominantly cattle grazing on large pastoral holdings. Mining, fishing and tourism are also active industries in the region. The Yalco Project straddles the McArthur River and Lorella Springs pastoral stations.

**Table 1** project details

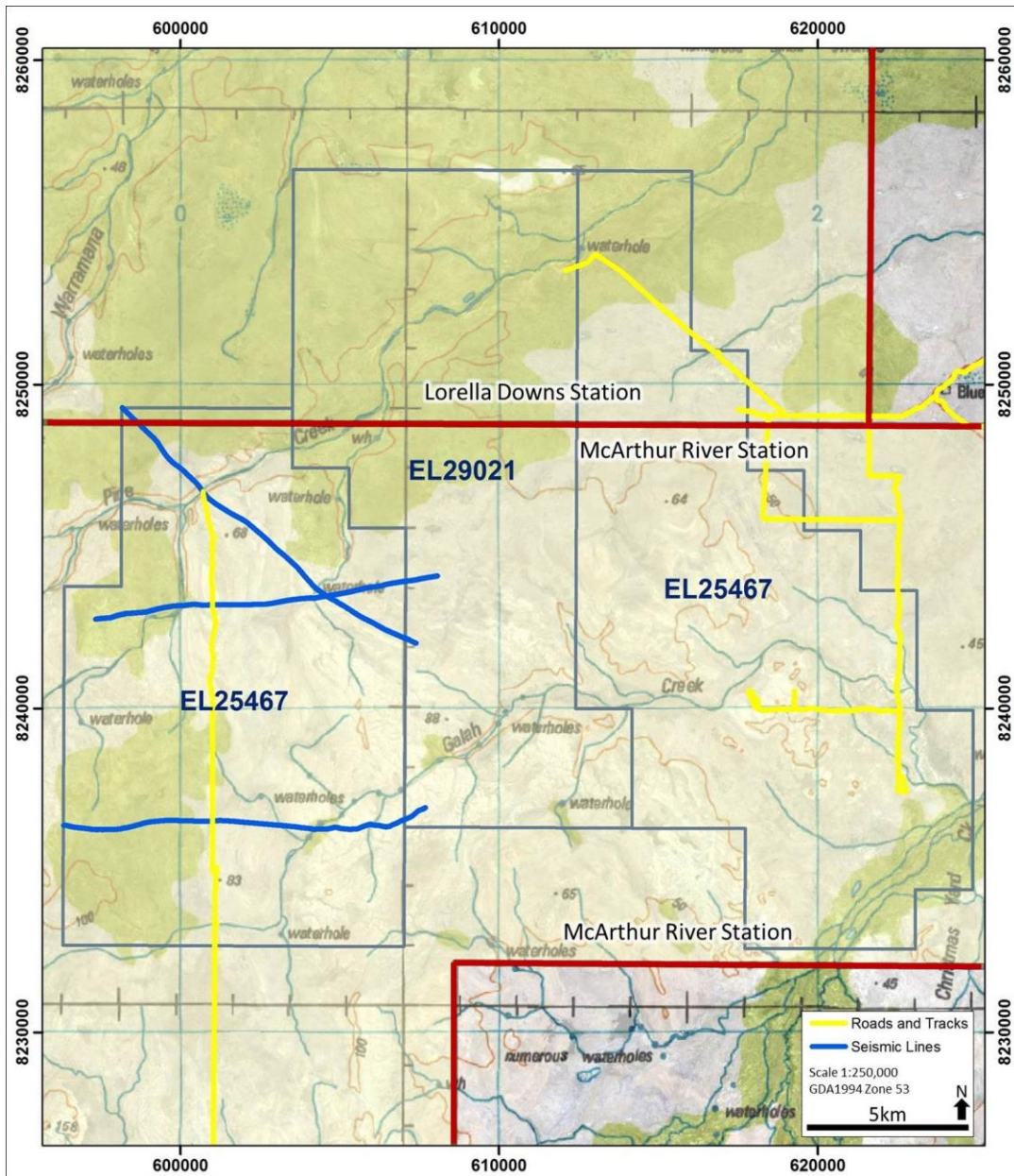
<b>Project Name:</b>	Yalco (previously Batten Creek)
<b>Location:</b>	Approximately 40 kilometres by road & station tracks north-west of Borroloola
<b>Site Access:</b>	Via the Borroloola – Bing Bong road from Borroloola then via established tracks (station & previous BHP exploration) to license areas.
<b>Mining Interest/s:</b>	EL25467, EL29021
<b>Title holder/s:</b>	EL25467 and EL29021 are owned 100% by Marindi Metals. Teck Australia Pty Ltd is earning 70% of EL25467 and EL29021 through exploration expenditure with an option to form a JV with Marindi Metals Ltd once the necessary earn in expenditure has been committed to the project.



**Figure 1** location map

**Table 2** Yalco exploration licenses (Figure 2)

Title number	Owner	Grant Date	Expiry Date
EL25467	Marindi Metals	15/08/2007	Renewal application under
EL29021	Marindi Metals	3/8/2012	02/08/2018



**Figure 2** tenement map of the Yalco Project showing tracks and station boundaries



### 5.3 Previous Activities and Current Status

A total of seventeen exploration companies are known to have previously worked in the area covered by the Yalco project over a period of approximately 40 years. A review of the available open file data indicates that most of these companies were focused on discovering McArthur River style Zn-Pb-Ag sediment-hosted massive sulphide (SHMS) deposits in sub-basins containing thickened sequences of Barney Creek Formation.

A wide range of different exploration techniques were applied to the project area by different companies, including stream sediment and soil sampling surveys, rock chip sampling, gossan searches, ground gravity, electromagnetic (EM) surveys (GEOTEM, HOISTEM, VTEM, QUESTEM) and a number of drilling programs. Most of the historical drilling has been shallow RAB drilling that has focused on areas where Barney Creek Formation is interpreted close to the surface or on manganese potential in Cretaceous sediments. There has been limited diamond drilling on and immediately adjacent to the project area, with most of these holes failing to test the target Barney Creek Formation.

In May 2014 Teck and Marindi Metals signed an earn-in option agreement. Teck is currently earning 70% of the project from Marindi and has an option to spend no less than \$3.5 million prior to 30 June 2018.

During the 2013-2014 reporting period (15<sup>th</sup> of August 2013 to 14<sup>th</sup> of August 2014) Teck completed basic reconnaissance work, stakeholder engagement, desktop reviews and field preparation for additional work programs.

Teck completed a number of surveys over the 2014-2015 reporting year including ground gravity; project wide airborne magnetics and radiometrics; and reconnaissance soil sampling.

#### 2015 – 2016 Field Season

Exploration activities conducted during the 2015-2016 MMP period are summarised below:

- A ground gravity program to infill the 2014 survey over the Emu Fault Corridor and Yalco East
- Three seismic lines across the Emu Fault Corridor
- Magnetotelluric data collected along the seismic lines
- Geochemical sampling program to infill the 2014 survey and cover the eastern part of the project
- Re-logging of historical drill holes
- An AAPA certificate over the Yalco project was received by Teck Australia August 2015.
- Track construction and subsequent rehabilitation work were undertaken to enable the seismic survey

#### 2016-2017 Field Season

Works completed during the 2016-2017 reporting period are summarised below.

Track, pad and camp area clearance to support drilling activities in August 2017.

- Drilling of water bores in preparation for diamond drilling activities at Yalco in August 2017
- Drilling of diamond drill hole YLDD001 in August 2017
- Commencement of an AMT survey over the Yalco East area in September.

In preparation for the diamond-drilling program at Yalco a water bore (RN 38498) was constructed and registered.

### 5.4 Proposed Activities

#### Diamond Drilling

For the 2018 field season up to three diamond drill holes and up to four water bores have been planned for the Yalco project. The drilling of these holes is entirely dependent on findings from data interpretation and subsequent target reviews. If targets are downgraded they will not be drill tested. The likely sites of the proposed drill holes are the Flying Fox, Pine Creek and Galah target areas.

The location of these holes is based on a number of factors including their conceptual prospectivity, evidence for sub-basin formation and thickening of the BCF in this area. This is supported by interpretations of seismic, magnetic and magnetotelluric data; geochemical anomalism and field mapping.

Drill holes will be collared with PQ or HQ sized core and this will be used until the collar has stabilized. Once this has occurred the rest of the drill hole is expected to be completed using NQ sized core.

Water bores may need to be constructed to support drilling activities. It is likely that the Pine Creek bore would be used to support any drilling programs in the Pine Creek and Flying Fox areas. If possible existing water bores will be used for any drilling activities in the Galah Creek area. If the bore, currently known to exist in the Galah Creek area is no longer useable, an additional bore may be required.

No clearing or drilling shall occur within 25m of the riparian vegetation of drainage lines and creeks.

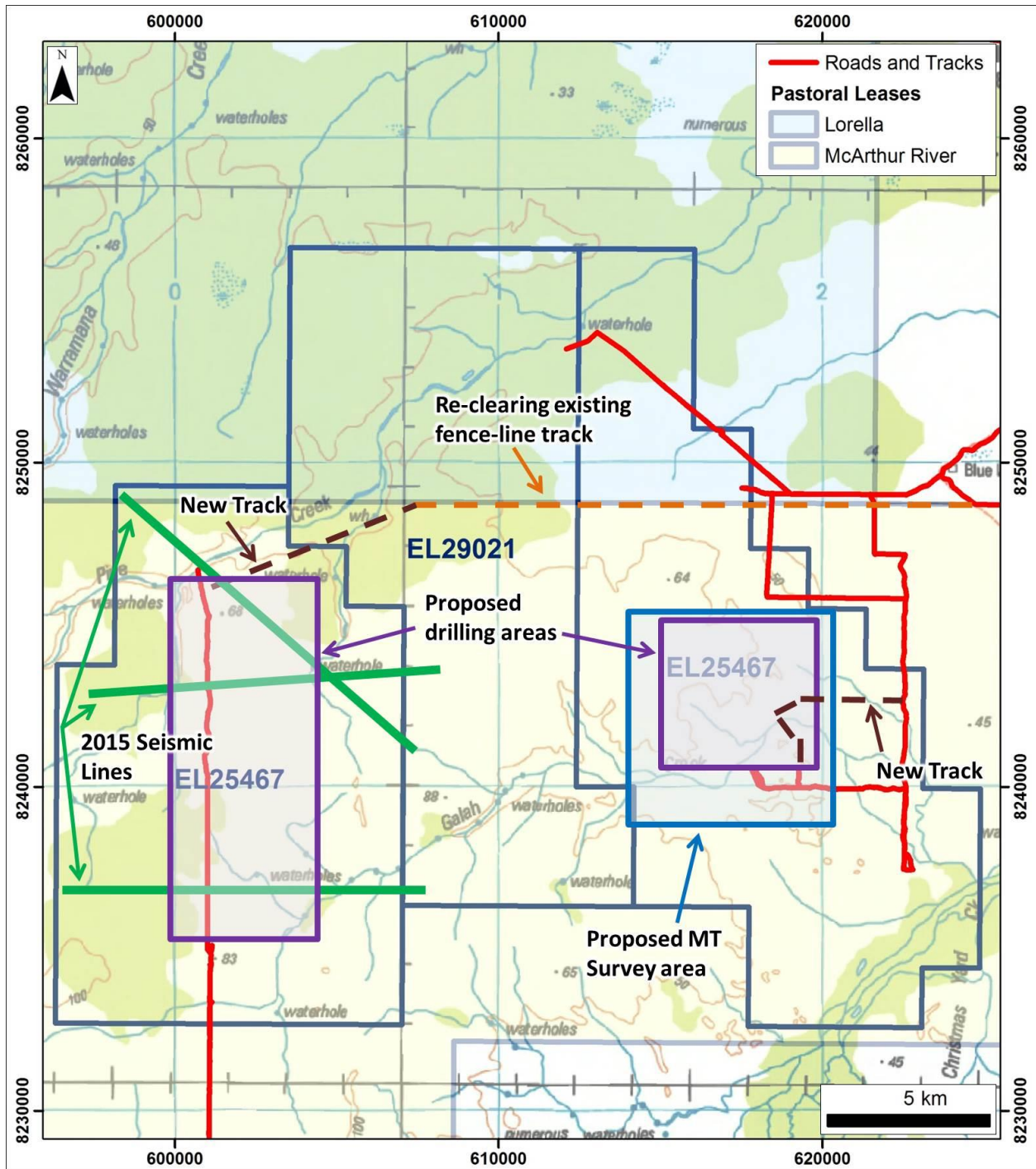


Figure 3 proposed drilling and AMT survey areas for 2018

*Additional Notes*

Drill collar coordinates represent a the centre of an area 30m x 25m in size. This allows for each collar to be appropriately positioned within this area based on ground conditions encountered during the drilling program. Each

drill hole requires a safe level pre-prepared work area (drill pad) of approximately 30m x 25m in size, free from vegetation and other fire and staking hazards (e.g. dead timber). The soil from each pad is piled at the side of the pad and returned during rehabilitation. Following completion of the holes all drill sites and sumps will be rehabilitated as per NT Government regulations and requirements. Typically the drill pads are rehabilitated progressively during and immediately following the drilling program. It is an objective of Teck's to have all drill pads rehabilitated prior to the wet season at the end of every year.

If progressed the construction of water bores on-site will comply with the Minimum Construction Requirements for Water Bores in Australia. A certified water bore driller will be contracted to undertake this work.

#### Access Tracks

Access to drill pads will be predominantly via existing tracks, where necessary tracks will be added for access, and will be rehabilitated post drilling. Should diamond drilling proceed at any of the targets a second access track may be cleared to support the drilling program; provide a second emergency escape route; and to reduce travel time to and from Borroloola.

Track construction is expected to involve clearing approximately six kilometres of new track and re-clearing approximately 16.5 km of existing fence line tracks that run between McArthur River and Lorella Springs pastoral stations. This would be done in consultation with the managers and owners of the two stations.

If the Galah target is drill tested, up to 6km of track will be cleared to enable access to the drill site and the water bore.

All tracks would be approximately 2.5m wide and all clearance will be done in consultation with the relevant stakeholders. The track will be constructed to minimize environmental damage and all ground disturbances will be cleared with cultural heritage monitors present. Note that the layout of the tracks shown may change following stakeholder consultation; field reconnaissance; and assessment of physical factors.

A bull dozer will be used for the work and wherever possible will clear with a raised blade. This prevents windrows from being built up, leaves topsoil in place and minimizes damage to rootstock.

Any new access tracks are likely to be rehabilitated at the end of the 2018 program depending on drilling results.

#### Audio Magnetotelluric Survey

Additional audio magnetotelluric surveys are planned for 2018. The audio magnetotelluric survey will focus on the area shown in Figure 3 proposed drilling and AMT survey areas for 2018. The survey will comprise the following:

- 3 man AMT crew using light or all-terrain vehicles to access the planned stations;
- All planned AMT stations are in the Yalco East area;
- For each station, shallow trenches (1.5m long, 20cm wide, and 10cm deep) and 1 post hole (10cm diameter by 1m deep) will be required. Trenches and post holes will be back-filled and rehabilitated immediately following the acquisition of the data when the equipment is collected.

Depending upon the outcomes of work programs completed during 2017, additional geophysical surveys may be undertaken, which may include time-domain electromagnetics (TEM) and induced polarisation (IP) surveys. These surveys are dependent upon a number of factors including the project budget for 2018 and physical access to specific areas. Potential ground geophysical surveys will concentrate on high priority areas identified through interpretation of detailed aeromagnetic and radiometric data, geological mapping and comprehensive data review.

#### Summary of Proposed Activities

Activities proposed for the 2018 field season at Yalco are summarised below in Table 3 summary of proposed activities

**Table 3** summary of proposed activities

<b>Mining Interests</b>	EL 25467 and 29021
<b>What time of the year will exploration occur?</b>	Drilling – between April 2018 and November 2019.
<b>How long is exploration expected to occur?</b>	Drilling: up to 15 weeks, mobilisation to site, camp and site preparation 2-6 weeks; demobilisation, pack up and site rehabilitation 2-4 weeks
<b>Type of drilling</b>	Diamond core; water bore RC/RAB
<b>Target Commodity</b>	Zn, Pb, Ag
<b>Is drilling likely to encounter radioactive material</b>	No
<b>Number of proposed drill holes</b>	Up to three diamond drill holes and four water bores are proposed for 2018
<b>Max. Depth of hole</b>	up to 1,400m for diamond hole, up to 100m for water bore
<b>Number and dimensions of drill pads</b>	Up to 7 drill pads (three for diamond drill holes, four for water bores). 40m x 30m pads for diamond rig (1200m <sup>2</sup> x 3); 15x15m pad for bores (225m <sup>2</sup> )
<b>Is drilling likely to encounter groundwater</b>	Potentially. The diamond holes are planned a few hundred metres away from Pine creek/Galah creek which are likely to have groundwater flowing beneath them.
<b>Number and dimensions of sumps</b>	~2-3 sumps for each diamond hole
<b>Line length (km) / track clearing (m)</b>	Drill tracks: 2km x 2.5m (access to drill pad and water bore) Access tracks: approximately 6km x 2.5m Re-clearing of existing tracks: 16.5km x 2.5m
<b>Costeans</b>	No
<b>Total Bulk samples (l x w x d)</b>	None
<b>Will topsoil be removed for rehabilitation?</b>	No – reapplied over cleared area to facilitate re-vegetation
<b>Previous disturbances yet to be rehabilitated (if known)</b>	Main N-S access track along the Emu Fault Corridor (12.5km)
<b>Total area disturbed (ha)</b>	Up to four hectares of new disturbance (drill pads, new tracks, camp sites, laydown areas); approximately 50,000m <sup>2</sup> of old tracks, pads and camp area to rehabilitate in total.
<b>Other</b>	Note: remaining area of re-cleared existing tracks is approximately 51,250m <sup>2</sup> ; approximately 9,000m <sup>2</sup> of which will be rehabilitated by the end of 2017.

## 4. CURRENT PROJECT SITE CONDITIONS

Table 4 project site conditions

Site Conditions	Description
<p><b>Local and regional geology</b></p>	<p>The project overlies rocks the Paleoproterozoic McArthur group, a thick sequence of sedimentary rocks that hosts a number of major zinc-lead orebodies in the region (e.g., HYC, Coxco etc.).</p> <p>Much of the area is covered by recent alluvium with the McArthur group rocks forming occasional outcrops. The Lynott Formation contains thinly bedded and laminated, medium to dark grey, variably pyritic, carbonaceous dolomitic siltstone and minor dolomitic siltstone, sandstone and breccia. The Reward Dolomite is a massive to (less commonly) thinly bedded dolostone, algal dolostone and dolomitic siltstone. Both of these units are resistive and form a considerable portion of the outcrop. Underlying these units is the Barney Creek Formation, which comprises massive to thinly bedded and laminated, variably pyritic, carbonaceous dolomitic siltstone and minor dolomitic siltstone, sandstone, breccia and tuffaceous siltstone, which are typically recessive. Teena Dolomite is a thick unit of interbedded massive to laminated, light grey to pinkish grey dolostone, algal and stromatolitic dolostone. The unit conformably overlies the Emmerugga Dolomite, which consists of massive light grey dolostone and algal dolostone and minor algal plate breccia. The rocks of the McArthur Group are typically faulted, gently folded and un-metamorphosed.</p> <p>The tenement area is assessed as a “G4 Geomorphic Province” (Aldrick &amp; Wilson, 1990). Of the six land systems described by Aldrick &amp; Wilson (1990), three occur within the area of ELs 25467 and 29021</p> <ol style="list-style-type: none"> <li>1. Broad or narrow fluvial corridors conducting regional drainage (i.e., McArthur River). Grey and brown clays and siliceous sands are characteristic, and mid-high open woodland of <i>Eucalyptus Terminalis</i> and <i>e. Microtheca</i> with some <i>e. Papuana</i> and <i>e. Polycarpa</i> occurs. Tall fringing riparian vegetation often includes <i>Melaleuca</i> SPP.</li> <li>2. Level to gently undulating plains of mainly unconsolidated, transported materials. Yellow and brown earths and cracking clays. Mid-high open woodland of <i>E.Tectifca</i>, <i>E.Terminalis</i> and <i>Erythropheleum Cholorostachys</i>.</li> <li>3. Undulating to rolling low hills on mainly argillaceous sediment. Lithosols and shallow yellow earths. Mid-high open woodland of <i>E.Leucophloia</i>, <i>E.Tectifca</i>, <i>E.Terminalis</i> and <i>Erythropheleum Cholorostachys</i>.</li> </ol>
<p><b>Hydrology</b></p>	<p>Water for drilling and camping is to be sourced and filtered a water bore that is likely to be drilled proximal to the camp and drill sites.</p> <p>The subsurface hydrology of the Yalco area is poorly understood due to a lack of drilling, notably on the western side of the project. Significant watercourses running through the project include Pine and Galah creeks, which are ephemeral and flow only during the wet season; and Batten creek, which flows year round.</p>
<p><b>Flora and Fauna</b></p>	<p>Climate of the area is tropical with the wet and dry seasons occurring between November to March and April to October respectively.</p> <p>The most extensive vegetation type is open woodland dominated by Darwin Stringybark, Eucalyptus Tetrodonta and Variable-barked Bloodwood c. Dichromophloia with spinifex understorey; and woodland dominated by Northern Box Eucalyptus Tectifca with tussock grass understorey.</p> <p>Investigation of the Northern Territory Natural Resource Management database for this project area is detailed in APPENDIX III and lists the vulnerable and endangered flora and fauna within the region. Fauna within the Yalco project includes kangaroos, wallabies, numerous bird species, lizards, and snakes. Crocodiles are also known to occur in the area. Cane toads, feral pigs, water buffaloes, brumbys and donkeys inhabit the area.</p> <p>Management of feral fauna, weeds and fire control is undertaken in conjunction with other regional stakeholders. Notification of located weeds and our fire control measures will be advised to the pastoralist and local authorities. Weed control will be ‘prevention first’ approach as per the NT Weeds Management Strategy. Introduction of weeds will be prevented by the prior and regular washing of all machinery prior to entry on site.</p> <p>The area is subject to occasional grass fires although these usually occur at the end of the dry season. Some fires are started by lightning, while others may be licensed controlled burn-offs by landowners. These are monitored via various state and nationally run bushfire websites.</p>

	Data obtained from a recent NRETAS review (see fauna summary Appendix III) identified the potential for the existence of a number of endangered species including the northern quoll and Gouldian finch. Teck Australia will ensure that all staff & contractors are made aware of the potential existence of endangered species and the need to restrict activities to avoid interference of any description. Contractors are made aware of this through the site induction, which details at risk species, invasive species and what to do when they are observed. The project or site manager at the time is responsible for inducting contractors when they enter site. In addition to this expert assessments made at Teck Australia's Reward/Teena project to the south of Yalco are being used to help identify species of conservation significance.
<b>Current Land Use</b>	The proposed work will fall within the McArthur River Pastoral Lease upon which normal grazing activities are carried out. The pastoral lessee will be contacted regarding the proposed work to be carried out. There are no parks, reserves, communities, town sites or aboriginal land within the boundaries of EL25467 and EL29021. There are no extractive mining activities taking place within EL25467 and EL29021.
<b>Historical, Aboriginal, Heritage Sites</b>	An AAPA authority certificate covering the Yalco project has been issued: C2015/138

## 5. ENVIRONMENTAL MANAGEMENT SYSTEM

### 5.1 Environmental Policy and Responsibilities

The exploration manager is accountable for ensuring every Teck Australia employee observes the Environmental Management procedures that comprise Teck's management system. The HSE coordinator (see org chart) is responsible for the execution of the environmental management of the project.

Teck Australia operates within the environmental, health, safety and community management standards. These standards are based on the Charter of Corporate responsibility, Code of Sustainable Conduct, Health and Safety Policy and Indigenous Peoples Policy, which are attached in Appendix IV.

All staff and contractors are responsible for implementing, and conducting sound environmental practices. In Statutory and Non-Statutory Requirements.

#### Statutory

Exploration will be conducted in compliance with the conditions of the authorisation and statutory requirements of the Northern Territory and Commonwealth Legislation. Outlined below are the relevant acts considered during exploration.

- Mining Management Act
- Minerals Title Act and Regulations
- Bushfires Act
- Weeds Management Act
- Aboriginal Sacred Sites Act
- Heritage Act
- Work Health and Safety Act
- Soil Conservation and Land Utilisation Act
- Territory Parks and Wildlife Conservation Act
- Plant Health Act
- Waste Management and Pollution Control Act
- Water Act

Relevant legislative and regulatory requirements are captured in Teck's legal risk register which is available for all staff prior to project activities.

Non-Statutory

There are no non-statutory requirements for the Yalco project.

**5.2 Induction and Training**

All key aspects of this Mine Management Plan and Teck HSEC Standards and policies are presented during inductions for all staff and contractors. Particular attention is paid to environmental issues during daily safety and planning meetings. These include discussions around hydrocarbon spills, water discharge, transmission of invasive species and other relevant topics. Any issues raised during these meetings will be formally noted in the weekly site report and actioned promptly.

On site inductions are given to all Teck staff, contractors and third parties that work within the project area. It is a site requirement that all inductees sign off on the induction once completed. Inductions are updated annually and include information relating to the following:

- Minimising environmental disturbance;
- Use of vehicles on the site;
- Capping all drill holes;
- Weed control;
- Removal and correct disposal of all rubbish from site;
- Removal of sample bags within six months or less;
- Rehabilitation of drill sites and access tracks;
- Responsibilities with regard to avoiding sacred sites and restricted work areas;
- Risk management and safety of all staff and contractors; and
- Incident reporting.

**5.3 Identification of Environmental Aspects and Impacts**

Identification of actual and potential environmental impact is undertaken by an analysis of the task/work to be undertaken. Prior to any field work, Teck Australia conduct comprehensive hazard and environmental impact assessments. These assessments are designed to address site-specific conditions, situations, and instigate appropriate mitigation and contingency measures if required. Figure 4 shows the risk matrix used by Teck Australia. Environmental Aspects and Impacts identified for this project are shown in Table 5 Environmental Aspects and Impacts (lists possible incidents and their associated controlling measures). Note that likelihood and consequence ratings as per Figure 4 are provided in the risk rating column.

<b>Risk Matrix</b>						
Combined effect of Likelihood / Consequences - Four Levels of Risk						
		Likelihood				
		5. Almost Certain	4. Likely	3. Possible	2. Unlikely	1. Rare
Consequences	A. Catastrophic	Extreme	Extreme	Extreme	High	High
	B. Major	Extreme	Extreme	High	High	Moderate
	C. Moderate	Extreme	Extreme	High	Moderate	Low
	D. Minor	Extreme	High	Moderate	Low	Low
	E. Insignificant	High	High	Moderate	Low	Low

**Figure 4** risk matrix used by Teck Australia





**Table 5** Environmental Aspects and Impacts (lists possible incidents and their associated controlling measures). Note that likelihood and consequence ratings as per Figure 4 are provided in the risk rating column.

<b>Environmental Aspects and Impacts</b>								
<i>Use: To assess risks and assign a treatment</i>								
<b>Risk Id</b>	<b>Date Revised</b>	<b>Aspect</b>	<b>Impact</b>	<b>Risk Rating</b>	<b>Management Measures (prevention)</b>	<b>Management Measures (remediation)</b>	<b>Residual Risk Rating</b>	<b>Acceptable ? Y/N</b>
1	3/8/2016	Clearing of drill pads / tracks / camp	Loss of native flora and habitat	Low 1, C	Locating tracks to minimise impact upon, or avoid if possible: environmentally sensitive areas, heritage areas and culturally sensitive sites o soils with high erosion risk, steep slopes and long slope lengths o creek crossings, floodplains and broad drainage lines; and o areas already degraded by soil erosion, over-grazing, fire or weeds • Minimising vegetation clearing by choosing routes that avoid densely vegetated areas and the clearing of large mature trees. • Minimising soil disturbance by using a stick rake or the ‘blade up’ method and wherever possible driving vehicles across unprepared terrain. • Keeping the width of tracks to the minimum required to safely meet the needs of the largest vehicle. • Minimising disruption to natural drainage lines by crossing creeks at right angles and maintaining the natural level of the creek bed at crossings. • Minimise the concentration and channeling of natural surface water flows by avoiding the formation of windrows at the sides of tracks. • Carefully planning and constructing tracks on sloping ground as they are susceptible to erosion. Minimise the risk of soil erosion by implementing erosion control techniques, such as using switch-backs (changes in direction), and erosion control structures such as diversion banks or whoa-boys, placed at suitable intervals. • Maintaining tracks that are frequently used over long periods. Minimise impacts by routinely inspecting and maintaining tracks to prevent small problems turning into large ones. Regular remedial works addressing issues such as deep rutting, formation of bulldust, and soil erosion should help reduce repair time and costs at the end of a project Ref: <a href="https://nt.gov.au/_data/assets/pdf_file/0011/203330/aa7-005-clearing-and-rehabilitation-of-exploration-gridlines-and-tracks-advisory-note.pdf">https://nt.gov.au/_data/assets/pdf_file/0011/203330/aa7-005-clearing-and-rehabilitation-of-exploration-gridlines-and-tracks-advisory-note.pdf</a>	Rehabilitation of tracks and disturbed areas will involve the implementation of the following measures: • Rehabilitating tracks progressively or as soon as possible after they are no longer required. This will minimise the risk of erosion and promote revegetation. • Grading any windrows and associated vegetation back onto access tracks. • Removing any obstructions from creek beds, and in-filling ruts or any areas of soil erosion. • Deep ripping tracks that have become compacted or deeply rutted and where the topsoil is significantly disturbed. Ripping across the slope, or cross-ripping, is recommended. Avoid ripping directly down-slope. • Installing erosion control structures, such as whoa-boys, on tracks that are deeply rutted or eroded. This protects rehabilitation works and ensures long term soil stability of the area.	Low	Y
2	3/8/2016	Invasive species	Spread of weeds / pests	High 3, B	Vehicle inspections prior to vehicles entering site. If required, vehicles will be washed down in Borrooloola, or cleaned at Teck’s Yalco field camp. Before leaving site vehicles will be inspected. Due to water shortage at site, no wash down facilities are available. Plant material will be manually removed and vehicles will be washed in Borrooloola or at Teck’s Reward field camp before leaving the area. All contractor vehicles will be inspected prior to entering site. Records will be kept recording dates that vehicles arrived and were inspected. If required, the vehicles will be washed following the inspection.	If any invasive species are found at site they will be removed and disposed of.	Low- Mod	Y

3	3/8/2016	Driving	Hitting fauna	Low 1, C	Restricted driving at night, restricted speed limits, awareness of animal pathways	Remove fauna from roads or tracks	Low	Y
4	3/8/2016	Driving – transport of fuels	Hydrocarbon leak / spill* - contamination of soil, surface and ground water	Mod-High 2, C	Suitable containers used for transport, readily available spill kits, procedures for disposing used oils. Conduct regular inspections during transport to ensure no leaks are present	Immediate removal of contaminants and contaminated surface. Disposal at an appropriate waste facility, likely Mt Isa	Low	Y
5	3/8/2016	Fuel Storage	Hydrocarbon leak / spill* - contamination of soil, surface and ground water	Mod-Low 1, C	All fuels are kept in self-bunded areas, with spill kits located in close proximity to fuels. No fuels to be kept within 25m of water course. For drilling, fuel will be stored in a self-bunded fuel truck. Inspections of the storage areas will be undertaken by the senior Teck staff member present on site – includes being built into the drill rig audit. Conduct regular inspections during transport to ensure no leaks are present	Immediate removal of contaminants and contaminated surface. Disposal at an appropriate waste facility, likely Mt Isa	Low	Y
6	3/8/2016	Refueling Vehicles	Hydrocarbon leak / spill* - contamination of soil, surface and ground water	Mod-Low 1, C	All refueling will occur >25m from water courses. Spill kits will be present in case of a spill.	Immediate removal of contaminants and contaminated surface	Low	Y
7	3/8/2016	Refuelling Generators	Hydrocarbon leak / spill* - contamination of soil, surface and ground water	Mod-Low 1, C	All generators kept on spill matting and bunded and/or self bunded Readily available spill kit	Immediate removal of contaminants and contaminated surface	Low	Y
8	3/8/2016	Drilling	Hydrocarbon leak / spill* - contamination of soil, surface and ground water	Mod-Low 1, C	Drilling to occur >25m from water course. Spill kits will be present in case of a spill.	Clean -up kits, Immediate removal of contaminants and contaminated surface	Mod-Low	Y
9	3/8/2016	Drilling	Dust and noise emission - pollution and disturbance to fauna	Low 1, C	Selection of drilling equipment that meets high standards. The rig and ancillary equipment will be subject to a safety audit prior to arriving on site. Due to the use of a diamond drill rig noise and dust pollution will be minimal. Due to the shallow nature of the water bore and the relatively short drill time noise pollution is not expected to have a significant impact on the surrounds.	Use dust and noise suppression if required	Low	Y
10	3/8/2016	Drilling	Sump overflow / spills: pollution and disturbance of flora	Moderate 2, C	Suitable Sump size and number	Pump excess water to other sumps to evaporate	Low	Y
11	3/8/2016	Camp site	Grey water discharge: pollution and	Low 1, D	Discharge to shallow evaporitic sump, containment in sump, no discharge into streams	Rehab of sump at end of season.	Low	Y

			disturbance of flora						
12	3/8/2016	Camp site	Littering : pollution and disturbance of flora and fauna	Low 1, D	All waste will be separated into categories of recyclable, non-recyclable and hydrocarbon, and removed from the site weekly to an appropriate waste disposal facility either in Borroloola or Mt. Isa. No clearing or drilling shall occur within 25m of the riparian vegetation of drainage lines and creeks	Removal of all waste from site.	Low	Y	

\*Please note that hydrocarbons used and stored on site will comply with Australian Standard 1940-2004 'The storage and handling of flammable and combustible liquids'.

#### **5.4 Environmental Audits, Inspections and Monitoring**

In 2016 Teck implemented an environmental baseline system that requires data collection and environmental management at all stages of the exploration process related to critical themes.

Environmental Auditing is completed internally by the exploration manager against pre and post disturbance documentation created for drill pad preparation - the Environmental Assessment and Site Preparation Instructions and Checklist (APPENDIX V).

Ongoing monitoring of disturbed areas is planned until acceptable to the relevant department authority.

In accordance with the Section 29 of the Mining Management Act, a register of all environmental incidents is recorded in a site register. All environmental incidents will be reported to the Chief Executive Officer of the DPIR in accordance with the procedures set out in the Environmental Incident Reporting Guidelines.

##### Weed and Pest management

Vehicles entering and exiting the project will be inspected for pests and weeds if they have been driven through areas with known infestations of invasive species. Onsite inspections will involve a visual inspection of the vehicle, with particular emphasis on examining the undercarriage. Any flora or fauna attached to the vehicle will be removed with a brush and disposed of. Due to a lack of facilities and water on-site, cleaning at this stage will not utilize water.

#### **5.5 Environmental Performance**

##### Objectives and Targets

The company's goals are to complete environmental inspections at the start and the end of each field season. The work is completed and signed-off by the HSE coordinator and approved by the exploration manager.

To date all non-essential tracks have been rehabilitated in accordance with the 2016 MMP and previous objectives prior to the wet season.

##### Performance Reporting

The review completed in Q3 2016 on the condition of the rehabilitated seismic tracks from 2015 showed no issues or corrective actions required. All targets in terms of regrowth and land stability were met.

#### **5.6 Emergency Procedures and Incident Reporting**

Emergencies of an environmental nature will be dealt with in accordance with section 5 herein, and also Teck Australia's Environmental Response Plan (Figure 5).

In accordance with the Section 29 of the Mining Management Act, a register of all environmental incidents' are recorded in a site register. All environmental incidents will be reported to the Chief Executive Officer of the DME in accordance with the procedures set out in the Environmental Incident Reporting Guidelines.

# Emergency Response Flow Chart

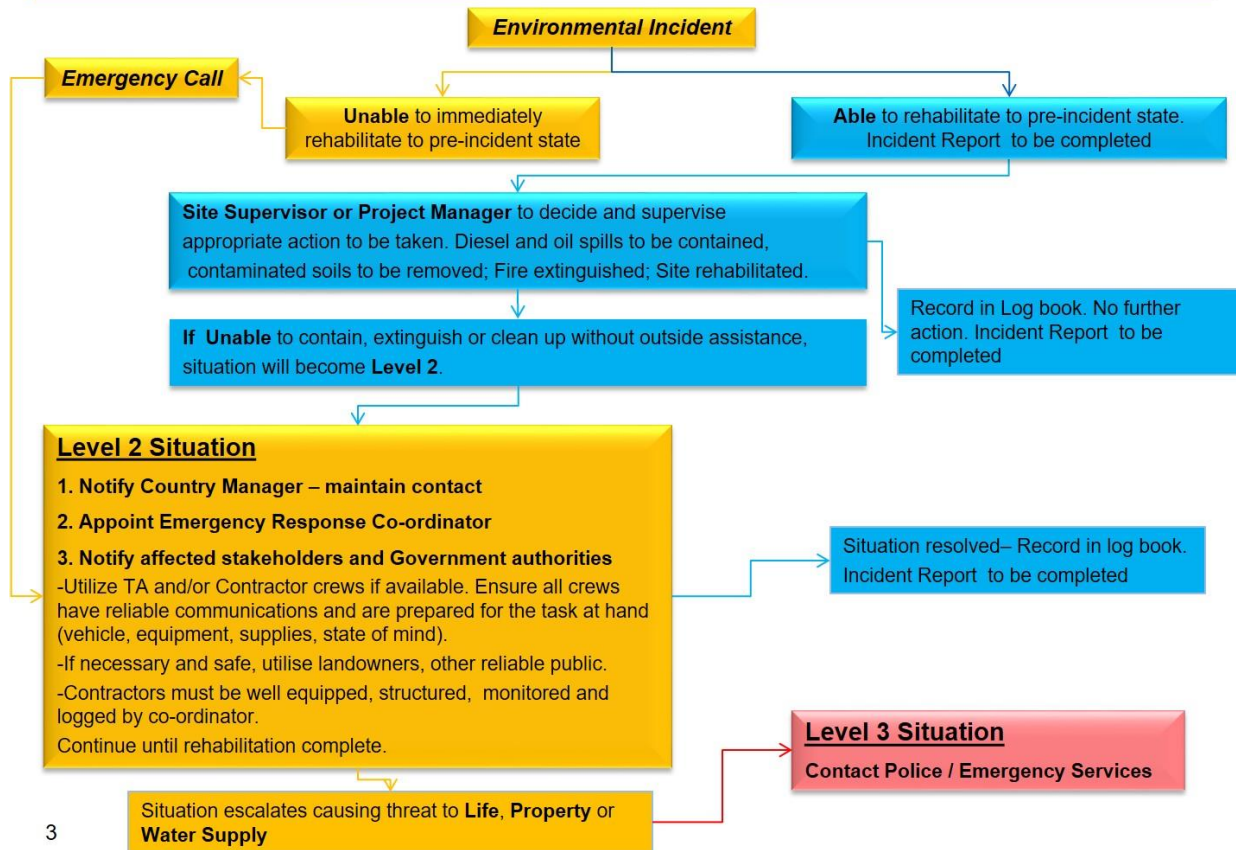


Figure 5 procedure used for dealing with environmental incidents

## 6. EXPLORATION REHABILITATION

The rehabilitation methods used and/or planned for the Yalco program are detailed below (Table 6).

Table 6 description of rehabilitation methods

Disturbance	Rehabilitation Methods	Schedule (Timing)	Closure Objectives/Tar gets	Monitoring and Remediation
Drill holes (Intersecting aquifers)	Collars capped/plugged immediately after drilling (commonly use concrete plug). When no longer required plugged across aquifer confining bed interface to 4m collars cut off at 400mm below ground level, plugged and backfilled with topsoil/subsoil. Soil backfill should be compacted and mounded slightly over the hole to allow for subsidence and prevent surface water pooling.	Collar temporarily capped after completion of the hole Rehabilitation of drill holes will be done after the drill campaign, and if necessary, after wireline logging. A temp capping may be done if the hole needs to be re-entered.	All holes capped or plugged prior to the start of the wet season/end of program	Inspection of collars (and drill pads) at regular intervals post rehabilitation (starting after the cessation of the wet season), and documented via photo point. Photographs are taken prior, immediately after, and at regular intervals after rehabilitation (6/12/24 months). Identified rehabilitation failures will be remediated as soon as reasonably possible.
Drill holes (Not intersecting aquifers)	Collars capped/plugged immediately after drilling (commonly use concrete plug). When no longer required collars are removed or cut off at 400mm below natural ground surface, plugged and backfilled with topsoil/subsoil. Soil backfill should be compacted and mounded slightly over the hole to allow for subsidence and prevent surface water pooling.	Collar temporarily capped after completion of the hole Rehabilitation of drill holes will be done after the drill campaign, and if necessary, after wireline logging. A temp capping may be done if the hole needs to be re-entered.	All holes capped or plugged prior to the start of the wet season/end of program	Inspection of collars (and drill pads) at regular intervals rehabilitation (starting after the cessation of the wet season), and documented via photo point. Photographs are taken prior, immediately after, and at regular intervals after rehabilitation (6/12/24 months). Identified rehabilitation failures will be remediated as soon as reasonably possible.
Drill pads	All drill cuttings, fencings, and general rubbish removed and disposed of at an approved facility Any windrows surrounding the pad should be removed to prevent erosion. Sumps should be filled and rehabilitated (see point below) The area should then be ripped to a depth of 75mm along the contour (not down slope) to loosen compacted soil and aid re-vegetation Stockpiled soil should be raked over the pad, and then covered with the top soil (kept in a separate pile when originally cleared). Vegetation matter (i.e. trees) removed during clearing should be moved back onto the pad to promote re-vegetation.	Rehabilitation of drill pads will be done after the drill campaign, prior to the start of the wet season.	Drill pads re-vegetated and blending in with natural surroundings. No water pooling/erosion.	Inspection of drill pads at regular intervals post rehabilitation (starting after the cessation of the wet season), and documented via photo point. Photographs are taken prior, immediately after, and at regular intervals after rehabilitation (6/12/24 months). Identified rehabilitation failures will be remediated as soon as reasonably possible.
Sumps	Bagged mineralised material (from the SRU) removed and disposed of at an approved facility (likely Mount Isa). If the sump contains slurry, flocculent should be added to remove particulate matter – all 'clean' water must be removed prior to backfilling. All plastic liners, fencing and general rubbish should be removed and disposed of at an approved facility. Stockpiled subsoil during excavation should be used to backfill the sumps, forming a slight mound to allow for subsidence and prevent water pooling.	Rehabilitation of sumps will be done after the drill campaign, prior to the start of the wet season. It should be done prior to, and/or in conjunction with drill pad rehabilitation.	Sumps re-vegetated and blending in with natural surroundings. No water pooling/erosion.	Inspection of sumps (and drill pads) at regular intervals post rehabilitation (starting after the cessation of the wet season), and documented via photo point. Photographs are taken prior, immediately after, and at regular intervals after rehabilitation (6/12/24 months).

	(As per drill pad rehabilitation) Upper topsoil, and removed vegetation should returned to the backfilled sumps, and the area ripped to 75mm along to contour to aid re-vegetation and prevent erosion.			Identified rehabilitation failures will be remediated as soon as reasonably possible.
Tracks	Back-grade all windrows onto the access track to prevent channeling and erosion Remove any fill or obstructions placed in gullies, creek beds, or waterways to allow for natural water flow to return Ripping of access tracks may be required if they have become compacted or deeply rutted, or the topsoil has been significantly disturbed. On sloping tracks avoid ripping down the slope. 200mm high berms should be installed perpendicular to the slope to reduce water flow and prevent erosion.	Rehabilitation of tracks will be done after the drill campaign, prior to the start of the wet season. A modified version of this rehabilitation may be done if tracks are to be re-used the following field season.	Tracks re-vegetated and blending in with natural surroundings. No water pooling/erosion.	Inspection of tracks at regular intervals post rehabilitation (starting after the cessation of the wet season), and documented via photographs. Photographs are taken prior, immediately after, and at regular intervals after rehabilitation (6/12/24 months). Identified rehabilitation failures will be remediated as soon as reasonably possible.
Camp	Sewage and grey water pits should have all infrastructure removed as soon as practicable, remaining contents should be buried <i>in situ</i> All fencings, recycling, and general rubbish removed and disposed of at an approved facility Any windrows surrounding the site should be removed to prevent erosion The area should then be ripped to a depth of 75mm along the contour (not down slope) to loosen compacted soil and aid re-vegetation Stockpiled soil should be raked over the pad, and then covered with the top soil (kept in a separate pile when originally cleared). Vegetation matter (i.e. trees) removed during clearing should be moved back onto the pad to promote re-vegetation.	Rehabilitation of the camp site will be done after the drill campaign, prior to the start of the wet season. A modified version of this rehabilitation may be done if the camp site is expected to be re-used the following field season	Cam site re-vegetated and blending in with natural surroundings. No water pooling/erosion.	Inspection of camp site at regular intervals post rehabilitation (starting with after the cessation of the wet season), and documented via photographs. Photographs are taken prior, immediately after, and at regular intervals after rehabilitation (6/12/24 months). Identified rehabilitation failures will be remediated as soon as reasonably possible.
Waste Sites	Remove all waste from the exploration site and dispose of at an approved facility All items that can be recycled (plastics, paper etc) should be taken to the nearest recycling centre Any areas contaminated with hydrocarbons or chemicals during the exploration program need to be remediated if not already done so –removal of all contaminated soil and replacing with clean fill. All fencings, and general rubbish should be removed and disposed of at an approved facility Any windrows surrounding the site should be removed to prevent erosion The area should then be ripped to a depth of 75mm along the contour (not down slope) to loosen compacted soil and aid re-vegetation Stockpiled soil should be raked over the pad, and then covered with the top soil (kept in a separate pile when originally cleared). Vegetation matter (i.e. trees) removed during clearing should be moved back onto the pad to promote re-vegetation.	Rehabilitation of waste sites will be done after the drill campaign, prior to the start of the wet season.	Waste site re-vegetated and blending in with natural surroundings. No water pooling/erosion.	Inspection of waste sites at regular intervals post rehabilitation (starting with after the cessation of the wet season), and documented via photographs. Photographs are taken prior, immediately after, and at regular intervals after rehabilitation (6/12/24 months). Identified rehabilitation failures will be remediated as soon as reasonably possible.



Performance Objectives

<b>Targets to be achieved during the Yalco 2017 exploration program</b>	
Objective	Responsible Party
Zero Lost Time Injuries. (Program Completion)	All Staff And Contractors.
No Significant Safety Incidents. (Program Completion)	All Staff And Contractors.
No Significant Environmental Issues. (Program Completion)	All Staff And Contractors.
Rehabilitation Of All Drillholes, Drill Access Tracks And Drillpads To DRDPIFR Requirements. (Program Completion)	All Staff And Contractors.
Statutory Reporting Of Activities. (Program Completion)	Teck Senior Geologist / Project Manager

This page shall be posted in a prominent place so that all employees and contractors can see the commitments that they are developing.