

EL10/2012  
St. Mary's  
Year 2 Annual Exploration Report for the  
Period 23/10/2013- 23/10/2014

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## Abstract

EL10/2012 St Marys lies in the Fingal-Avoca District in North Eastern Tasmania where coal has been mined since the 1880's from both open-cut and underground mines exploiting coal seams hosted in the Triassic Upper Parmeener Supergroup of the Tasmanian Basin. Within EL10/2012, Imperial is exploring for modest size open-cut and underground thermal coal resources that are of sufficient quality to meet export coal specifications.

This report summarises the second year exploration program undertaken by geological consultants Global Ore Discovery (Global Ore) on behalf of Imperial. In this reporting year desktop analysis included land access notifications, cross section interpretation, exploration target calculations, financial analysis, legislation reviews and drillhole planning and permitting. Field work focussed on identification and mapping of sites for drilling, land holder liaison and meetings with DPIPWE in regards to Geoconservation sites.

Key findings were:

- Preliminary economic modelling, based on field and desktop research, has indicated that a mine with a 4:1 open-cut stripping ratio and a 2Mt annual production may be economic given current conditions.
- Based on these parameters, an exploration target of 0-10 Mt of thermal coal has been identified
- A number of Geoconservation sites potentially constrain any development operations that could be undertaken in Imperial's nearby tenure in the Fingal Valley (namely EL8/2012 and EL15/2012). These issues could directly impact on the potential viability of any discovery within these ELs. Imperial's intention is to develop its tenure in the Fingal Valley concurrently utilising multiple open-cut source areas to meet target export production. The potential target in EL10/2012 will not support a stand-alone operation, and the resolution of these issues within the other tenements is therefore of critical importance. As a result, Imperial have delayed drilling pending review of the Geoconservation sites.

Due to the identification of the Geoconservation sites within the nearby tenements, Imperial have not been able to complete the Program of Works as originally planned. Imperial have applied to the department for a suspension of license conditions, to allow the project and the Geoconservation sites to be re-assessed. If this assessment is favourable, and pending macro-market conditions, Imperial will move the projects (including EL10/2012) forward through resource drilling.

Year 3 exploration proposal includes Five holes consisting of 535m of reverse circulation and 80m of diamond drilling, coal quality testing, land access agreements, cultural heritage, resource modelling and planning and design and permitting of the year four program.

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## 1. Introduction

The Fingal-Avooca District in North Eastern Tasmania was identified by Imperial Coal Pty Ltd (Imperial) through an Australian wide evaluation aimed at identifying high quality, under explored coal provinces. Coal has been mined from the Fingal-Avooca District since the 1880's from both open-cut and underground mines, exploiting coal seams hosted in the Triassic Upper Parmeener Supergroup of the Tasmanian Basin. Currently, Cornwall Coal Company (a subsidiary of Cement Australia) is mining coal from the district and in September 2013, Hardrock Coal Mining Pty Ltd was granted a mining licence to extract coal from an underground mine development beneath the Fingal Tier.

Imperial's preliminary analysis of the open-file geological and geophysical datasets identified three core areas within the Fingal-Avooca district to undertake further exploration for coal resources. Applications were submitted to Mineral Resources Tasmania in in the first quarter of 2012 for three licences, including EL10/2012, which is the subject of this report.

EL10/2012 covers an area of 32 sq. km and its core area is located approximately 13km WNW from St Marys Township (Figure 1). Access to the licence is via the Esk Highway and Mt Nicholas Road. Rail is available approximately 5km to the south of the property via Mt Nicholas Road. The rail provides a valuable link to the export port of Bell Bay near Launceston, some 180km to the north.

Within EL10/2012 Imperial is exploring for modest size open-cut and underground thermal coal resources that are of sufficient quality to meet export coal specifications. This report summarises the first year exploration program undertaken by geological consultants Global Ore Discovery (Global Ore) on behalf of Imperial during the period 23/10/2013 to 23/10/2014.

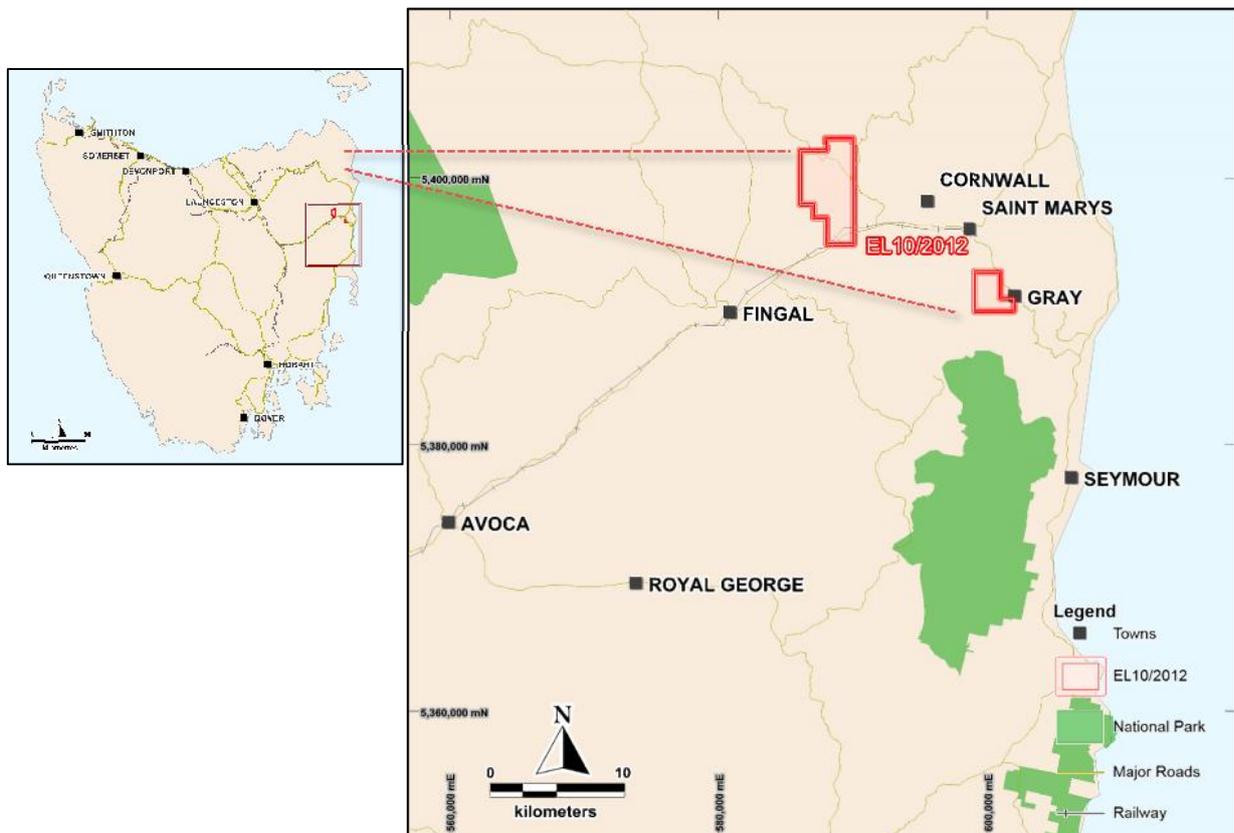


Figure 1 Location of EL10/2012 - St Marys

## 2. Review of Previous Work

Imperial's first year exploration program of remote sensing, historic drillhole review, field mapping, and sectional interpretation has increased the geological understanding of coal occurrences in EL10/2012. Key aspects of this work were

- ASTER processing and field follow-up program
- Identification and mapping of new coal outcrops
- New understanding of the potential for shallow coal (potentially open-pittable) through sectional interpretation

Due to significant vegetation cover at the time of acquisition, ASTER imagery was of limited use in remote mapping of the stratigraphy, but was useful in determining the potential windows of outcropping sediments in large heavily vegetated expanses. Mapping by Imperial located 1 new outcropping coal seam with a thickness of 0.9m in EL10/2012. Preliminary analysis of the relationship between this particular seam outcrop and historic drilling indicates that this may potentially be the Pluto Seam (Parbury, 1979), which was intercepted in drillhole DOM 12 in the licence at 54.8m depth.

New outcrops of coal seams provide additional 3D control on the distribution of coal seams at relatively low cost when compared to drilling. Dip measurements indicate that Mt Durham may be separated structurally along a north-south fault from Mt Nicholas, as postulated by previous workers in the area.

First pass sectional interpretation of the historic drilling integrated with new field geological and structural mapping suggests that many of the seams are potentially shallowly covered on the southern and northern flanks of Mt Durham, where flatter topography may reduce strip ratios of any coal resource discovery. Initial analysis indicates that small size resources may be identified by further work.

## 3. Exploration Completed during the reporting period

### Preliminary Economic Modelling

The Triassic Upper Parmeener Supergroup Coal Measures that occur within the licence area have been shown by previous explorers to potentially contain significant resources of thermal coal. There is no known occurrence of metallurgical or PCI coal within the licence area. Thermal coal has the lowest value of the three product types described.

The exploration licence contains a significant area that is overlain by a thick sequence of Jurassic dolerite, which is responsible for the steep topography of the project. As a consequence, the areas covered by dolerite are difficult and expensive to explore and are amenable to underground mining only.

All exploration activities must be dictated by potential economic or strategic outcomes. These potential outcomes vary through time depending on circumstances that are forecast or that prevail at the time. The economic outlook for thermal coal over the foreseeable future does not warrant the level of investment required to define a significant underground resource that can only be recovered via an expensive capital and operating cost underground mine.

Any mining operation is dictated by the quality of the resource, the cost of mining and processing the resource, infrastructure required for providing power, water and transport of product to customers, and most significantly, the value of the commodity when sold. The project area has excellent infrastructure within easy reach, with power and rail within a short distance from potential operational areas, and access to a deep water shipping port at Bell Bay.

A rational decision was made to direct all immediate exploration activities into determining the potential of the licence area to contain an economically viable open-cut thermal coal resource that occurred beyond the base of the Jurassic dolerite. An economic model was developed for a potential open cut mining operation within the Fingal Valley that produced 2 million tonnes per year of washed coal suitable for export to Asian customers for power generation. There are no markets available for coal in Tasmania outside of those already being supplied by Cornwall Coal, which has been operating in Tasmania under various guises for over 100 years.

The economic model was developed over a 15 year mine life, which included all exploration, development and capital expenditure. The model included the construction of a wet coal processing plant and utilisation of the existing TasRail Fingal-Bell Bay rail network and access to TasPorts Berth 2 at the Port of Bell Bay. Local contractor mining rates were used in the model.

To aid in deriving some of the parameters in the economic model collection of important infrastructure data was carried out by an investigative team from Imperial Coal. This investigative team undertook site visits and discussion with key personnel at the TasPorts Bell Bay facility, existing/potential coal mine operators in Tasmania and Melbourne, and desktop research into the potential capacity of the rail system to service any further coal transportation.

The Bell Bay Port is currently a 24hour operation with shipping movements that are tide limited and the largest capacity cargo ships are Panamax (60-80,000 DWT). Given this an estimated maximum potential capacity of a berth supplying a single ship that enters port on a high tide and leaves on the next high tide (1 ship per 24 hours) is around 10-20Mt/annum. At the time of the inspections a paved Berth (Berth 2) was potentially available for use with a stockpile capacity of around 160kt. Further industrial land was available in the port lands for additional stock piles, which would require a conveyor system to the loading docks. An unused woodchip loader could potentially be retrofitted to handle the coal loading, however detailed engineering studies would be required to confirm that this is the case. Additional rail of approximately 1km would be required to be built for the current rail termination to deliver coal to any loading facilities at Berth 2.

Imperial's Fingal Valley project lies approximately 180km away from Bell Bay Port by Rail. Desktop research undertaken on the Tasrail indicates that currently coal is transported 2-3days a week from Cornwall's Fingal Operation (~160,000tpa). In 2012-2013, \$100 million was spent on rail upgrades, with another \$120 million expected between 2013 and 2018. In 2013 a new locomotive fleet was purchased and this was expected to increase capacity by up to 90%. Based on the capacity of the rail line to Bell Bay with the current freight amounts from Cornwall's operations at Fingal and expected increase rates of freight from Hardrock's Fingal Tier operation, Imperial estimates if it was to export 2million tonnes per annum through Bell Bay using the current rail network that 2-3 additional rail sidings would be required to meet the demand.

Using the information gathered Imperial modelled two key metrics for an open-cut mine; the FOB price of the product and the stripping ratio of the operation. Modest price and exchange rate forecasts were used based on information collected from leading International and Australian based trading companies. The maximum stripping ratio that an open-cut mine within the Fingal valley could economically tolerate was 4:1 (4BCM's waste to 1 tonne of ROM coal). The target area for the near-term exploration within the licence was generated based on this stripping ratio.

## Sectional Interpretation and Exploration Target Calculations

Global Ore Discovery have completed sectional interpretation on EL10/2012 in the St Mary's area to assist with the calculation of exploration target sizes.

The interpretations used drilling completed by the Department of Mines Tasmania and other explorers from the 1970s to the 1990s. A total of 10 drill holes were included in the model, with an average spacing of 1km by 1km. Most drillholes were core, although some were open hole with limited downhole geophysics.

The sectional interpretation also utilised outcrop and prospect locations recovered from Mineral Resources Tasmania and new outcrops identified in the field by Imperial. In Year 1 of the program, Imperial completed preliminary check logging of some drillholes available in the Tasmanian government core library, and attempts were made to verify the locational accuracy of drillholes in the field although most were well rehabilitated. To allow for locational inconsistencies within the historic drillhole dataset, elevations of drillhole collars were tied to a DEM grid created from 25k government topographical data.

Open-cut exploration targets were calculated based on an average strip ratio of 4:1. This strip ratio assumed a planar topographic surface and may therefore over-estimate tonnes if the surface is convex or under-estimate tonnes if the surface is concave. It additionally did not consider any batter on the highwall.

The density of the seams was assumed to be 1.5g/cc. This is considered conservative as seams prior to wash typically have a higher density due to ash content. Notably, most wash tests use a 1.5g/cc cut-off so calculations using this value will more than likely represent the tonnes of washed product.

Seams with less than an average thickness of 1m were not of interest due to economic considerations and have not been considered in the calculation.

Dip is shallow (between 1-2 degrees) on well-controlled sections, and this was used to extrapolate on less-controlled sections (i.e. with only one hole, or between sections without drilling and no faulting modelled or easily observed due to the scarcity of data).

These exploration targets did not consider losses generated from:

- Oxidation – no information is available to model the losses due to oxidation
- Mining method – no losses are considered for dilution and ability to extract the complete seams.
- Geological intrusion and washouts – dolerite bodies have intruded parts of the sequence in the nearby drilling, however due to lack of data these have not been considered. Washouts have been observed by the Authors to potentially stope out coal seams in the Mt Nicholas Area; losses due to washouts have not be considered in the exploration target.
- Faulting – modelling of seams by Imperial and staff of Hardrock Mining (pers. comm.) indicate that faulting may not be as significant as suggested by previous explorers in the Fingal Tier area, however no losses due to faulting have been used in the calculations of the exploration target size.
- Wash plant processing – Losses at the wash plant additionally have not been estimated in the calculations of the exploration target size.
- In some cases, drill holes failed to intercept the anticipated seams, indicating potential pinching out. This has not been included in the exploration target calculations. Seams were modelled as being laterally continuous between control points, even when not intersected, and this will lead to over-estimation of the target size. Average seam thickness did not account for pinch outs, however in other cases abnormally thick seams have also been ignored.

The exploration targets also did not consider the potential of additional tonnes that could occur in a 4:1 average strip ratio mine scenario due to the reduction of overburden from the mining of the overlying seams where the interburden was sufficiently thin.

### Work Approval Programme

The preparation for MRT of the Work Approval Programme for the proposed drilling programme was carried out by Imperial Coal and Donato Environmental Services. Donato Environmental Services carried out all the mandatory searches and analyses of the publicly available databases for matters of ecological and cultural significance. Donato Environmental Services then spent 3 days in the field carrying out a visual inspection of the proposed work areas and noted any relevant observations for inclusion in the proposal.

The final location of the proposed drillholes was a two part process. Initial sites were located close to the planned locations, utilising areas that had been cleared by forestry operations. Considerable time was spent re-establishing suitable access to the proposed drill sites along existing forestry trails. Final drillhole locations were determined following a site inspection of all the proposed drill sites by a representative of Donato Environmental Services. A report by Donato Environmental services is attached to the report in Appendix 1 – Donato Environmental Services Report.

## 4. Discussion of results

### Silkstone Exploration Target Calculations

At Silkstone (St Mary's), 2 seams/seam groups (Fenton and Cornwall) were modelled in cross sections (Figure 2, Figure 3). The average thickness of Cornwall Seam was calculated to be 3.14m (from 10 holes) with the underlying Fenton Seam averaging 1.62m (from 6 holes). Open-cut exploration target sizes for the Cornwall seam in a 4:1 average strip ratio scenario was 0-8Mt while the Fenton Seam was 0-2Mt giving a total exploration target size of 0-10Mt..

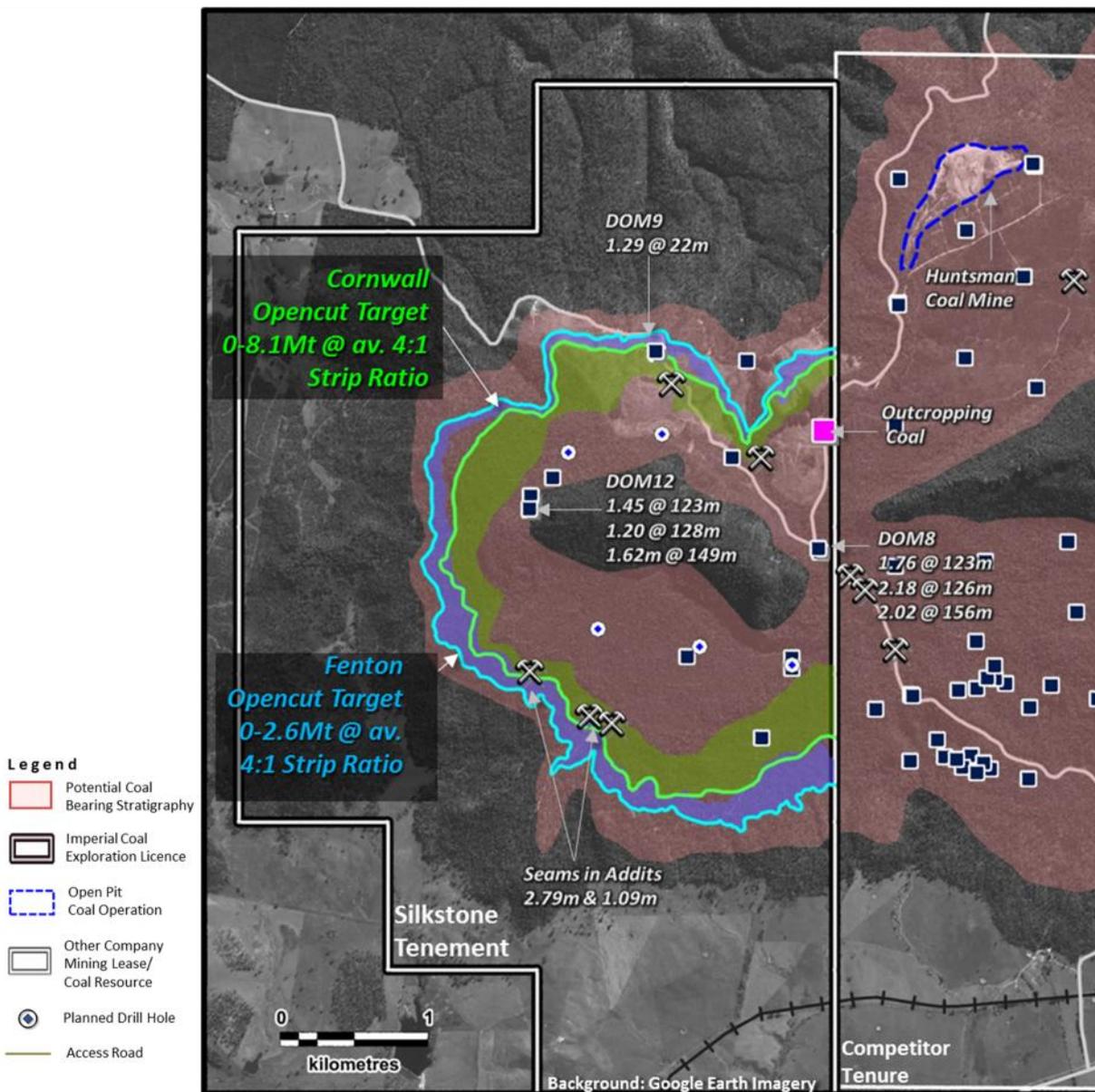


Figure 2 Plan View of Exploration Target Areas for Opencut Coal in EL10/2012

The drill program submitted to the department aimed at converting as much of this exploration target as possible to an inferred resource if drilling intersected seams as anticipated.

Although this is a significant exploration target, it would not warrant the development of a stand-alone open-cut operation for export thermal coal. Future exploration will therefore need to be conducted in conjunction with Imperial's nearby licences EL8/2012 and EL15/2012.

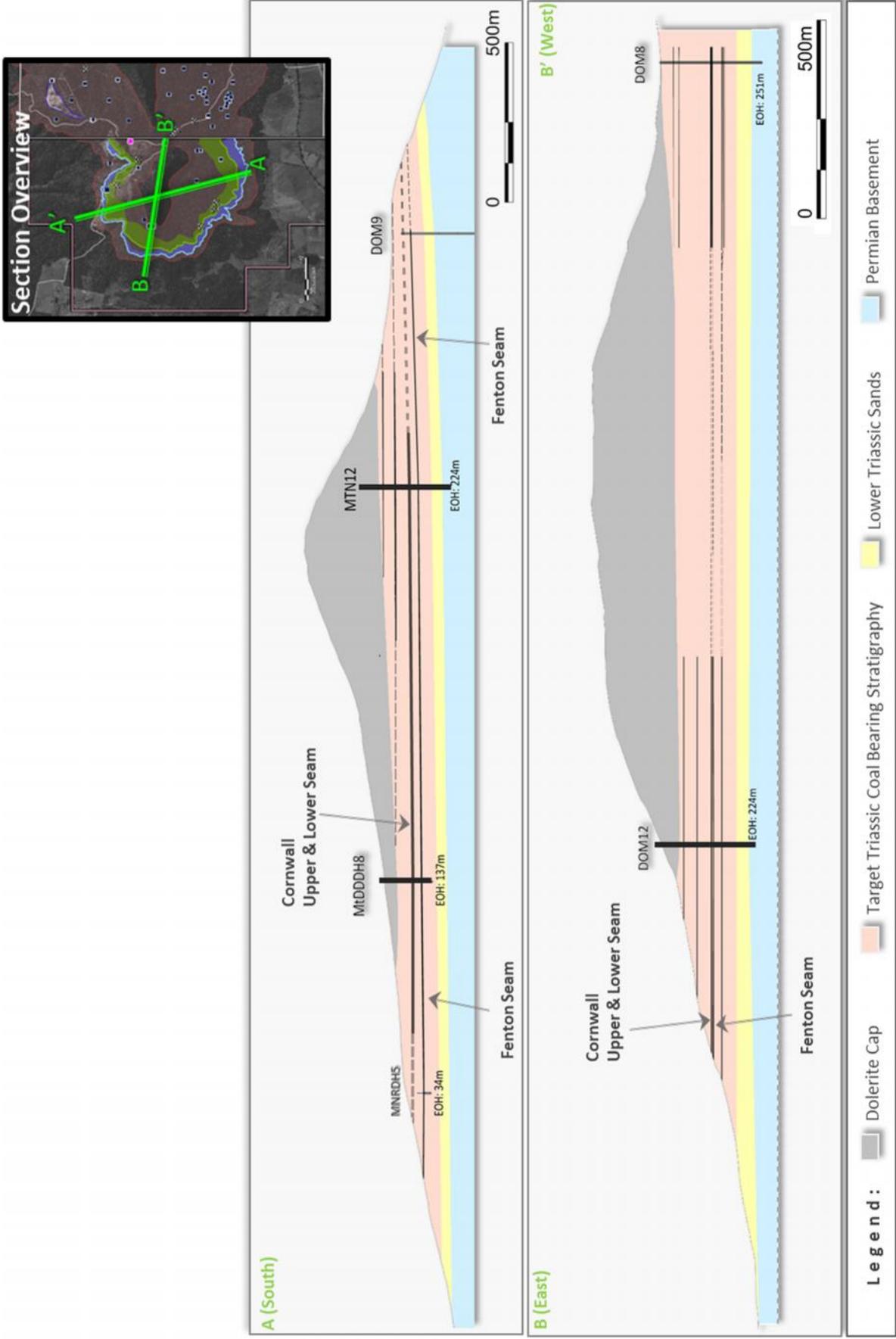


Figure 3 Example of Cross Sections generated to calculate the exploration potential of the Cornwall and Fenton Seams

## 5. Conclusions

Imperial's second year exploration program built on the first year data compilation and field mapping by completing sectional modelling, exploration target calculations, preliminary financial modelling, landholder liaison and environmental studies on proposed drill sites.

Preliminary economic modelling, based on field and desktop research, has indicated that a mine with a 4:1 open-cut stripping ratio and a 2Mt annual production may be economic given current conditions. Based on these parameters, Imperial has identified the exploration potential for a small (0-10 Mt) open-cut thermal coal target within EL10/2012. Proposed drillholes have been sited in highest potential areas, with the aim of maximising size and confidence of a future inferred resource.

Environmental studies of the proposed drillhole locations has identified a Geosite coincident with the open-cut exploration target in Imperials nearby licenses EL8/2012 and EL15/2012. Given that the exploration target within EL10/2012 is of insufficient size to warrant stand-alone development, the resolution of the Geosite is of critical importance. Imperial is therefore seeking a suspension for licence conditions on EL10/2012 St Mary's, pending the results of the re-assessment of the Geosites in EL8/2012 and EL15/2012.

## 6. Environment

None – See Donato Environmental Report (Appendix 1 – Donato Environmental Services Report) for additional information on Environmental matters that may be of issue for further exploration in the Licence

## 7. Expenditure

Imperial has not met the expenditure that was expected on the licence due to not undertaking the drill program. This drill program is anticipated to be undertaken if the Geosites in EL8/2012 and EL10/2012 are reassessed and deemed not to be an impediment to any future open-cut mining.

*Table 1 Expenditure statement for EL10/2012*

	Annual Expenditure
1A. Geology	\$ 14,656.36
1B. Geochemistry	\$ -
1C. Geophysics	\$ -
1D. Remote Sensing	\$ -
2A. Gridding	\$ -
2B. Drilling	\$ 3,420.00
3. Land Access Costs	\$ 4,452.96
4. Rehabilitation	\$ -
5. Feasibility Study	\$ 4,560.05
6. Other (fees, surveys etc)	\$ 6,742.84
7. Administration Costs	\$ 3,043.46
TOTAL	\$ 36,875.67

## References

Bacon, C.A., 1983. The Mt Nicholas Coalfield. MRT openfile Exploration Report, UR1983\_41.

Parbury, C.F., 1979. Progress Report for August 1979, Exploration Licence 7/79. MRT openfile Exploration Report, 79-1372

## Keywords

Coal Black

Coal General

Fingal Coal Field

St Mary

Mt Nicholas

Mt Durham

Cornwall Seam

Fenton Seam

Upper Parmeener

Lower Parmeener

Tasmanian Basin

ASTER

EL10/2012

Geosconservation Sites

## Appendix 1 – Donato Environmental Services Report

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## Environmental desktop study of exploration lease EL10/2012 – Silkstone, Fingal Valley, Tasmania

Report to:

Imperial Coal

June 2014

V1

REPORT

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## Distribution

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Imperial Coal	Version 1	20 June 2014	Chris Creagh

## Background

Imperial Coal Pty Ltd (Imperial Coal) holds three tenements for coal in the Fingal Valley in northeast Tasmania. These tenements, Avoca (EL15/2012), Merrywood (EL8/2012) and Silkstone (EL10/2012) cover a combined area of 520 km<sup>2</sup> and are shown in Figure 1. Historic and active coal mining operations exist in tenure adjacent to Imperial Coal's exploration tenements including the active Duncan Mine. Historic exploration drilling has been conducted within Imperial Coal's leases by previous tenement holders indicating prospective thermal coal resources. Results from these historic drilling programs have been used to help define the currently proposed coal exploration program to be conducted by Imperial Coal. One of these tenements, exploration lease (EL) 10/2012, known as Silkstone, is located approximately 10 km northwest (direct line) of St Marys and covers an area of 32 km<sup>2</sup>. The area of interest for the current proposed coal exploration activities is located in the northern and central portion of the lease and contained entirely within primary timber production zone land.

Exploration activities in Tasmania are governed by Mineral Resources Tasmania (MRT) under the *Mineral Resources Development Act 1995* (MRD Act). A Mineral Exploration Code of Practice has been developed and is approved under section 204 of the MRD Act. Compliance with this Code is a standard licence condition for all explorers. Prior to exploration drilling taking place, a work program must be submitted to MRT for approval. As part of the approval process, land managers and other relevant government bodies are invited to comment on the program. The work program must include details of the activities to be undertaken as well as potential impacts to flora, fauna, archaeological sites and mitigation measures to be implemented to minimise impacts. Proposed rehabilitation methods should also be provided within the work program.

As part of the work program approval process, Imperial Coal engaged Donato Environmental Services (DES) to undertake an environmental desktop study to be submitted as part of the work program approval. Specifically, the desktop study was to include details on:

- land tenure and status of the area of interest;
- current land use of the area of interest;
- soil descriptions that may be affected by earthmoving operations;
- vegetation that may be affected;
- rare or threatened species or communities known from within the area of interest;
- sites of historic or archaeological significance; and
- any other environmental constraints.

This report provides the findings of this desktop study as well as observations of field conditions as reviewed during a site visit in May 2014 by DES. Management and precautions to be taken to limit any potential impacts are provided and recommended methods for

rehabilitation are also included. This report covers exploration activities on the Silkstone lease only. Specific reports covering exploration activities on the Merrywood and Avoca leases are provided separately.

## Proposed drilling program

Imperial Coal is currently proposing to undertake exploration drilling for coal (thermal) within the Silkstone exploration lease (EL10/2012). An area of interest within the lease has been defined and a drilling program developed to target this area. Figure 2 shows the area of interest and proposed drill holes. Five drill holes are proposed at five sites. Drilling will consist of one diamond drill hole and four open-hole drill holes. These sites, denoted as SLKDDH01, SLK12, SLK16, SLK22 (open-hole sites) and SLK04 (diamond drill hole site) are shown on Figure 2 and photographs of each site is provided in Appendix A. Specific details of the drilling program are provided in the main work program approval application (provided by Imperial Coal).

Each drill site will encompass a hard-stand area of approximately 25 m by 25 m (excluding access tracks). This area will allow for safe access and operations during drilling activities while limiting disturbance to the extent feasible. Wherever possible, above-ground tanks will be used to contain and re-circulate water encountered during drilling activities. Where it is not possible to locate tanks on site, sumps approximately 2 m long by 1 m wide and 0.5 m deep will be constructed downstream of the drill hole. For open-hole drill sites, one tank or sump will be required while for diamond drill hole sites, three sumps or tanks will be required. Drilling activities will be short term with open-hole drilling completed in approximately one day (depending on conditions encountered during drilling) and approximately ten days for diamond drill holes (again dependent on conditions). Drilling will be conducted during day time only, and no night drilling will be conducted. Drillers will be based in towns close to the site and no camps will be required. Rehabilitation of the sites will be conducted as soon as practical at the completion of drilling activities.

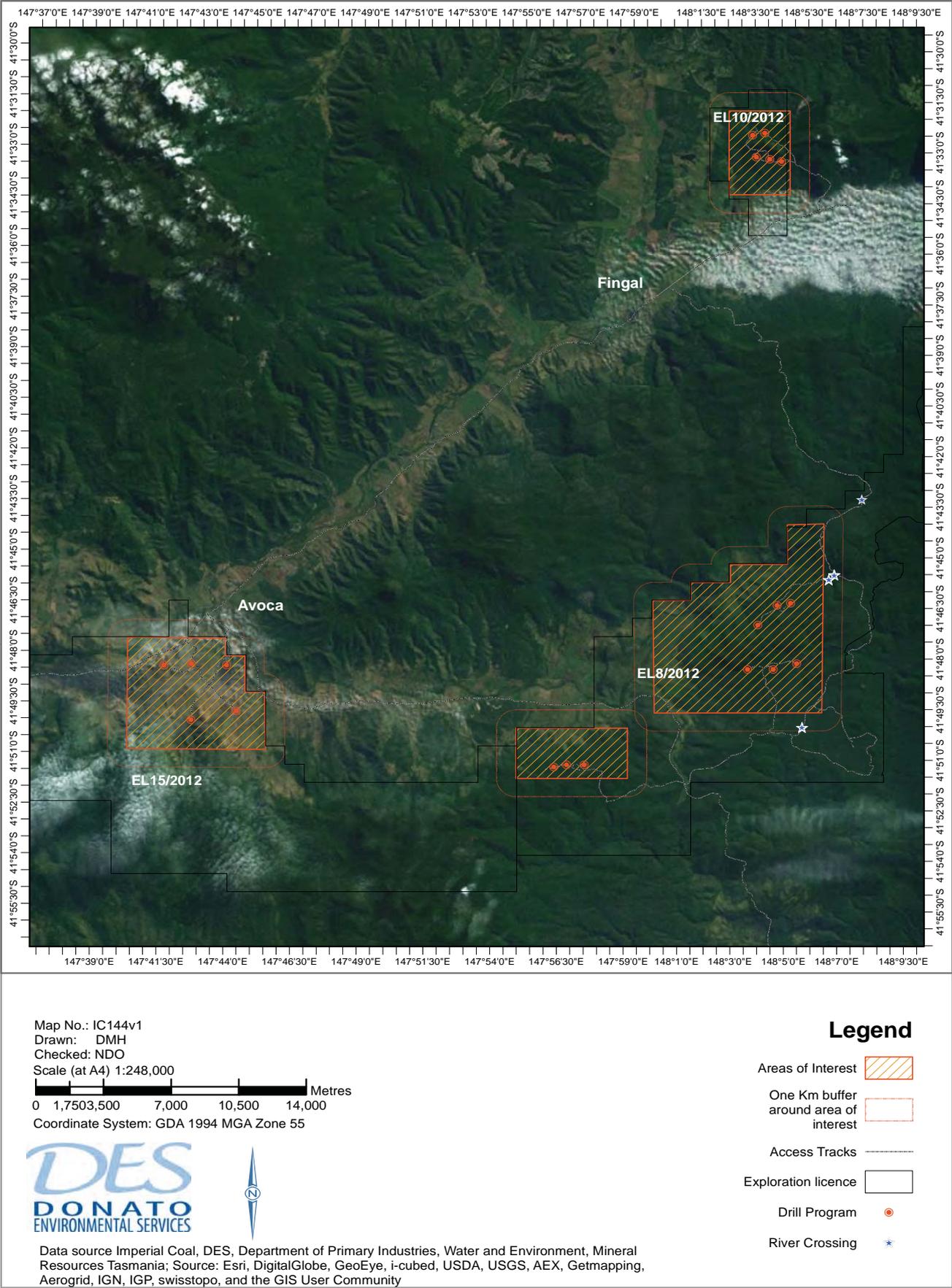
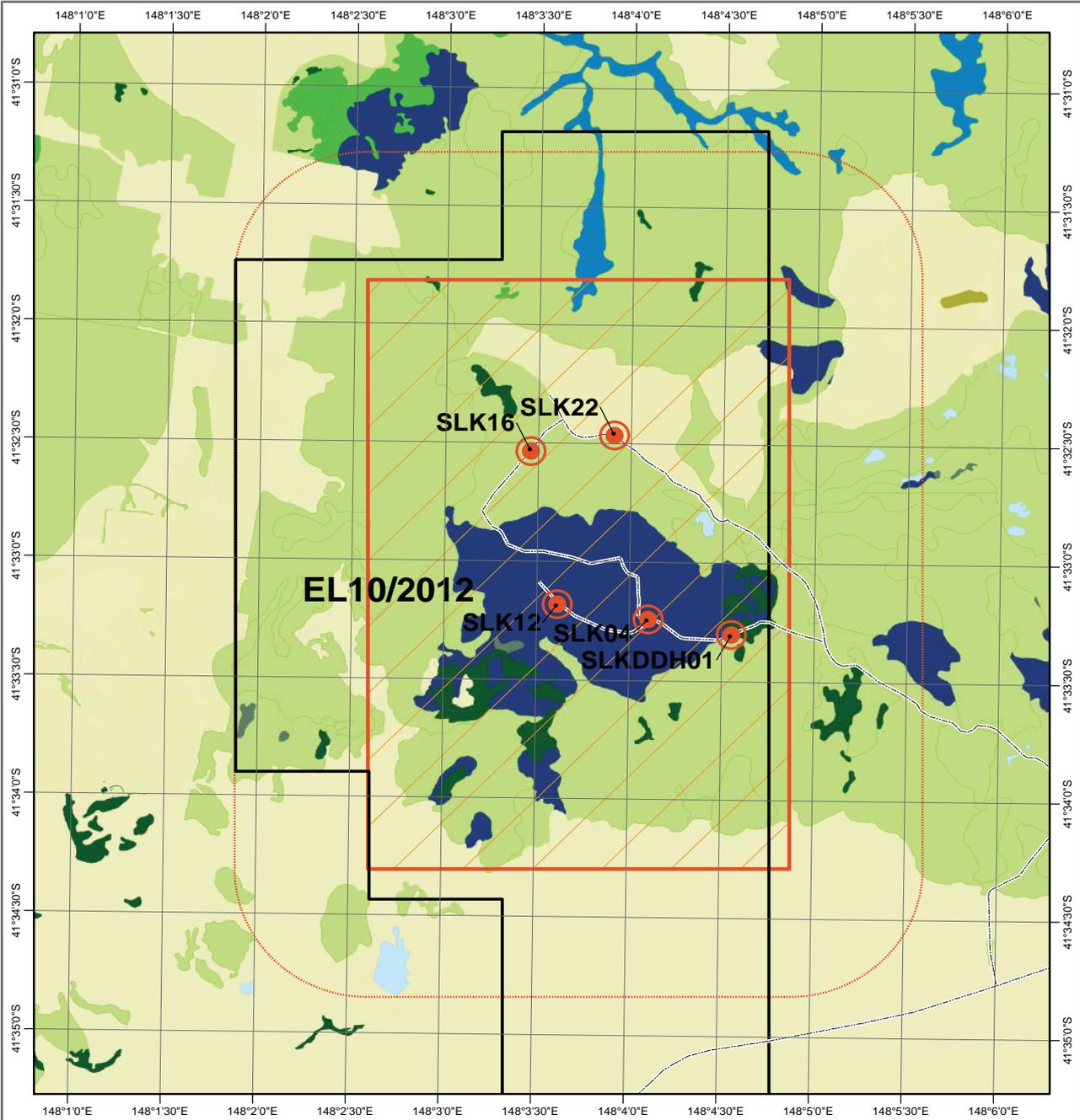


Figure 1. Imperial Coal Pty Ltd exploration tenements in the Fingal Valley, Tasmania



Map No.: IC142v2  
 Drawn: DMH  
 Checked: NDO  
 Scale (at A4) 1:40,817

Coordinate System: GDA 1994 MGA Zone 55



Data Imperial Coal, DES, Department of Primary Industries, Water and Environment, Mineral Resources Tasmania

Exploration licence

Drill Program

- |                                       |  |  |  |
|---------------------------------------|--|--|--|
| Other natural environments            |  | Agricultural urban and exotic vegetation |  |
| Scrub heathland and coastal complexes |  | Dry eucalypt forest and woodland         |  |
| Wet eucalypt forest and woodland      |  | Moorland sedgeland rushland and peatland |  |
| Areas of Interest                     |  | Native grassland                         |  |
| One Km buffer around area of interest |  | Non eucalypt forest and woodland         |  |
| Access Tracks                         |  | Rainforest and related scrub             |  |

Document Path: N:\GIS\Databases\Imperial Coal\IC142v2 Silkstone.mxd

Figure 2. Imperial Coal’s Silkstone tenement, Exploration Lease 10/2012

## Methodology

Information presented in this report is primarily derived through desktop surveys. Database searches were carried out to obtain available information on flora and fauna species, soils, land tenure and any other environmental matters of significance both on a state and federal level in the area of interest. Searches specific to threatened flora and fauna included:

- Department of Primary Industries Parks, Water and Environment databases (Natural Values Atlas and the land information system Tasmania (List)) within and extending to 1 km beyond the boundary of the area of interest (as shown on Figure 2);
- other databases such as the Atlas of Living Australia: Tasmania, within and extending to approximately 1 km beyond the boundary of the area of interest;
- an EPBC protected matters search within and extending to 1 km beyond the boundary of the area of interest;
- other relevant databases and online publications such as, but not limited to, Natural Resource Management (NRM) North Tasmania

Searches specific to threatened fauna included:

- Birdlife Australia database – search was performed for the overall tenement areas

Other searches specific to Important Bird Areas; RAMSAR wetlands, vegetation types, heritage, geoconservation, soils, reserves, covenants, private reserves, land status and use included, but not limited to:

- an EPBC protected matters search within and extending to 1 km beyond the boundary of the area of interest;
- Birdlife Australia database search within and extending to 1 km beyond the boundary of the area of interest;
- Department of Primary Industries Parks, Water and Environment Natural Values Atlas Tasmanian Vegetation database (Natural Values Atlas and the List) within and extending to 1 km beyond the boundary of the area of interest; this database was searched for vegetation associations within the area of interest;
- an EPBC protected matters search within and extending to 1 km beyond the boundary of the area of interest;
- reserves, covenants and private reserves such as those owned by, but not limited to, Tasmanian Land for Conservation and Wildlife Trust were determined via the Natural Values Atlas and personal communication (pers. com. D. Madden-Hallett, DES); and
- general literature and databases such as, but not limited to, the Australian Soils database, Mineral Resources Tasmania database, the Natural Values Atlas database, the List, Australian Heritage database, Tasmanian Heritage Register, National Land and Water Resources Audit Atlas, Environment Protection Agency Tasmania

and Australian Rivers and Natural Resource Management (NRM) North Tasmania.

A field visit of the area of interest including each proposed drill site was conducted from 19 to 21 May 2014 inclusive, by Noëlle Overdevest (DES) and Chris Creagh (Imperial Coal Pty Ltd). The site visit included reviewing accesses to each drill site and identifying any environmental issues associated with drilling activities (including location of sites and access). Opportunistic observations of wildlife and flora within the vicinity of the drill sites and accesses were conducted and documented. Photographs of all sites were taken to show relative location of site, extent of clearing (if required) and environment directly adjacent to the drill sites. All drill sites were marked with a GPS for later mapping. Specific mitigation measures to avoid and minimise potential environmental impacts were identified as part of site observations and where required, drill sites were adjusted to avoid or minimise any clearing required. No specific flora or fauna surveys were conducted as part of the site visit.

## Results

### Land tenure, status and current use

The area of interest for the current work program is shown in Figure 2. The area of interest for the current proposed drilling program is located on land classified as permanent timber production zone land. Small areas of regional reserve land (Avenue River regional reserve and the Nicholas Range regional reserve) occur within the north-western and eastern portions of the lease respectively. These areas within the exploration lease are small and will not be accessed as part of the current drilling program. Areas of private timber reserve also occur within the western and southern portions of the lease and away from the proposed drill sites. Current forestry activities (pine plantations) are located in close proximity to some of the proposed drill holes (namely SLK22) while the Duncan open cut mine (The Cornwall Coal Company Pty Ltd) is located directly east of the Silkstone lease area. All drill sites are located on previously cleared land (as shown in photographs in Appendix A) and access is via existing forestry tracks. No impacts to current land use practices have been identified as a result of the proposed drilling activities.

### Soils

A review of soil types within the area of interest was conducted using the Natural Values Atlas and the List database system. Although specific soil testing data of the drill sites and access tracks was not available, soils within the region are classed as sodosols, derived from stream alluvium, swamp and marsh deposits (flood plain); (floodplains > 4m AHD) and swamps. The results of the database search indicated that there is a low to very low potential for acid sulphate soils to be encountered at the proposed drill site locations. Establishment of the drill sites may necessitate levelling of the drill pad (at some sites). Any soils removed will be stockpiled (conserved) next to the site prior to levelling and compacting the pad. On completion of drilling activities and

as part of rehabilitation activities, these soils will be returned over the disturbed area and the area lightly scarified to promote infiltration and revegetation. One small area in the south-eastern corner of the lease has been identified as having a high potential for acid sulphate soils to occur (as indicated in the List database). This area is located some 4 km from the closest proposed drill site (direct line) and consequently will not be disturbed through the proposed drilling program.

## Vegetation

A search of vegetation types within the Silkstone exploration lease was conducted over the area of interest including a 1 km buffer around this area. The vegetation types identified from this search is provided in Table 1 and shown in Figure 2. During the site visit a review of vegetation types along access tracks and drill sites was also conducted. As shown in the photographs provided in Appendix A, vegetation within the Silkstone area of interest has been modified through previous forestry practices. Drill site locations were selected to minimise the amount of vegetation to be cleared with previously cleared areas chosen where possible. Preparation of the drill sites will require removal of some grasses and small regrowth and removal of the topsoil. These materials will be stockpiled adjacent to the pad during drilling activities and re-spread over the site on completion of drilling. Care will be taken to minimise the spread of weeds as part of rehabilitation activities.

**Table 1. Vegetation types identified for the area of interest (List)**

Vegetation type	Vegetation community	Occurrence at drill sites and/or access tracks (DES field observations)
Wet Eucalyptus forest woodland	<i>Eucalyptus delegatensis</i> forest with broad-leaf shrubs <i>Eucalyptus obliqua</i> wet forest (undifferentiated)	Not observed
Rainforest and related scrub	Nothofagus - Atherosperma rainforest	Unlikely
Dry eucalypt forest and woodland	<i>Eucalyptus amygdalina</i> forest on mudstone <i>Eucalyptus delegatensis</i> dry forest and woodland <i>Eucalyptus viminalis</i> grassy forest and woodland <i>Eucalyptus sieberi</i> forest and woodland not on granite <i>Eucalyptus amygdalina</i> forest and woodland on dolerite <i>Eucalyptus obliqua</i> dry forest	Present

Vegetation type	Vegetation community	Occurrence at drill sites and/or access tracks (DES field observations)
Non eucalypt forest and woodland	<i>Acacia delbata</i> forest	Present
Agricultural, urban and exotic vegetation	Agricultural Land Unverified plantations for silviculture Plantations for silviculture Regenerating cleared land Weed infestation Regenerating cleared land	Present (plantations)
Native Grassland	Lowland grassland complex Lowland grassy sedgeland	Possible
Scrub heathland and coastal complexes	Broad-leaf scrub	Possible

### Rare or threatened species or communities

A review of potential rare or threatened species and communities as listed under the *Environmental Protection and Biodiversity Conservation (EPBC) Act* (federally-listed) and the *Threatened Species Protection (TSP) Act 1995* (state-listed) was conducted. The search was conducted within and extending to 1 km beyond the boundary of the area of interest (as shown in Figure 2). The findings of this search are summarised in Appendix B.

Under the EPBC Act, two listed threatened ecological communities were recorded as possibly occurring or relating to the defined search area. Neither of the communities, Alpine Sphagnum Bogs and associated fens (endangered under the EPBC Act) and Lowland Native Grasslands of Tasmania (critically endangered under the EPBC Act) were observed during the site visit. The Silkstone area of interest has been modified through previous forestry practices and consequently, drill sites could be sited in cleared areas that will require very little additional clearing (only general earthworks for pad levelling and the removal of small regrowth shrubs as shown in photographs in Appendix A). Although a specific flora assessment of the sites was not conducted, opportunistic observations and a review of the conditions determining the presence of the specifically listed Lowland Native Grasslands of Tasmania communities indicates it is unlikely to be present due to the disturbed nature of the sites, the relatively small size of the open areas (less than one hectare) and the percentage of native groundcover not meeting the requirements of these ecological communities. Adjacent land may contain Lowland Native Grasslands of Tasmania communities however no drilling activities will occur in adjacent areas and therefore no impact is expected should these communities be present.

Under the EPBC Act, 13 avian species and three mammal species were listed as possibly occurring or relating to the defined search area (Table 2). No fauna species listed under the TSP Act were recorded for the search area. A search of the Birdlife Australia database was conducted as a combined search of the three Imperial Coal tenements (not specifically Silkstone). This search indicated that 88 avian species had been recorded from surveys for the area. Of the 13 avian species listed under the EPBC Act, six (Australasian Bittern, Swift Parrot, Gould's Petrel, Fork-tailed Swift, Tasmanian Azure Kingfisher and White-throated Needletail) have not been recorded for the area and consequently all but Swift Parrot are considered unlikely to occur within the vicinity of the drill sites. Habitat exists for Swift Parrot and therefore it may occur within the area, however proposed drilling activities are unlikely to affect this species (no clearing of large vegetation). The remaining species are unlikely to be impacted by the proposed drilling activities due to the short-term nature and small scale of drilling activities and only minor clearing of regrowth taking place.

The three listed mammal species (Tasmania Devil, Spotted-tail Quoll, and Eastern Barred Bandicoot) are nocturnal species and may occur within the vicinity of the drill sites however they are unlikely to be impacted by drilling activities as no drilling will be conducted at night and all activities will be conducted in a short time frame. Any sumps will be barricaded to prevent potential wildlife drowning in sumps (falling in and not being able to get out).

One amphibian (Southern Bell Frog, listed as vulnerable under the EPBC Act) and two fish (Eastern Dwarf Galaxias and Australian Grayling, both listed as vulnerable under the EPBC Act) were recorded from the searches. These species are unlikely to occur in the vicinity of the drill sites due to a lack of nearby water bodies. A small catchment pond (approximately 2 m in diameter) is located near one drill site (SLKDDH01) however it is small, isolated and unlikely to provide sufficient habitat for the two fish species. The SLKDDH01 drill site was relocated downstream of the water body to avoid any potential impacts and all contractors will be made aware of its presence and the importance for ensuring no impacts occur.

As expected, a number of introduced species (listed as key threatening processes under state and national legislation), have been identified as likely to occur or relate to the area of interest (Domestic Cat, Brown Hare, European Rabbit, Goat and Red Fox). Drilling activities are unlikely to have an impact on these species due to the short-term nature of drilling activities. All rubbish generated on site (for example food wastes) will be disposed of in sealed bins and removed from site as soon as possible to prevent attracting introduced species to the sites.

Flora species of conservation significance listed under the EPBC Act and TSP Act are provided in Appendix B. Although no specific field surveys were conducted for threatened flora species during the site visit, it is unlikely that the listed species will occur within the vicinity of the

Silkstone drill sites. As mentioned, the sites are located on previously cleared areas with little to no vegetation clearing required. No impact to any listed flora species is considered likely as a result of the proposed drilling activities.

**Table 2. Fauna species listed under the EPBC Act**

Species name	Common Name	EPBC Act	EPBC Act migratory	EPBC protected matters species or species habitat	Likelihood of occurrence at drill sites and/or access tracks
<i>Litoria raniformis</i>	Southern Bell Frog	Vu		Likely	Unlikely
<i>Galaxiella pusilla</i>	Eastern Dwarf Galaxias	Vu		Likely	Unlikely <sup>2</sup>
<i>Prototroctes maraena</i>	Australian Grayling	Vu		May occur	Unlikely <sup>2</sup>
<i>Dasyurus maculatus maculatus</i>	Spotted-tail Quoll	Vu		Known	Possible
<i>Perameles gunnii gunnii</i>	Eastern Barred Bandicoot	Vu		Likely	Possible
<i>Sarcophilus harrisii</i>	Tasmanian Devil	En		Likely	Possible
<i>Aquila audax fleayi</i>	Wedge-tailed Eagle	En		Likely <sup>4</sup>	Possible
<i>Ceyx azureus diemenensis</i>	Tasmanian Azure Kingfisher	En		May occur	Unlikely <sup>1</sup>
<i>Botaurus poiciloptilus</i>	Australasian Bittern	En		May occur	Unlikely <sup>1</sup>
<i>Lathamus discolor</i>	Swift Parrot	En	M	May occur	Possible
<i>Pterodroma leucoptera leucoptera</i>	Gould's Petrel	En		May occur	Unlikely <sup>1</sup>
<i>Tyto novaehollandiae castanops</i>	Masked Owl	Vu		Known	Unlikely <sup>2</sup>
<i>Apus pacificus</i>	Fork-tailed Swift		MM, M	Likely	Unlikely <sup>1</sup>
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle		MT, M	Known	Possible
<i>Hirundapus caudacutus</i>	White-throated Needletail		MT, M	Known	Unlikely <sup>1</sup>
<i>Myiagra cyano-leuca</i>	Satin Flycatcher		MT, M	Known	Possible
<i>Ardea alba</i>	Great Egret		MW, M	Likely	Unlikely <sup>1</sup>
<i>Ardea ibis</i>	Cattle Egret		MW, M	Likely	Unlikely <sup>2</sup>
<i>Gallinago hardwickii</i>	Latham's Snipe		MW, M	May occur	Unlikely <sup>2</sup>

<sup>1</sup> – Not recorded from surveys listed in Birdlife Australia database (for combined search area of all Imperial Coal tenements)

<sup>2</sup> – Unlikely based on lack of suitable habitat available in Silkstone area of interest

<sup>4</sup> - Breeding habitat likely

Vu - Vulnerable

En - Endangered

M - Marine

MM - Migratory marine

MW - Migratory wetlands

MT - Migratory terrestrial

## Sites of historic or archaeological significance

A desktop assessment for sites of Aboriginal heritage was conducted by Aboriginal Heritage Tasmania (AHT). The results from this assessment indicate there is a low probability of Aboriginal Heritage being present within the Silkstone Lease. A copy of the assessment has been provided in Appendix C (including a copy of the Unanticipated Discovery Plan that will be maintained on site during ground disturbance works and all contractors made aware of its requirements).

A search for matters of national environmental significance and other matters protected under the EPBC Act and a search of the Register of the National Estate (RNE) was conducted for the area of interest of the Silkstone EL. From these searches, two listed sites were recorded. Both are natural sites (Barnes Road Forest Area and Gleadow Creek Forest Area) and are listed as indicative places due to their importance for rare flora communities. The Barnes Road Forest Area is located 13 km north, north-east of Fingal and adjacent to the EL10/2012 western boundary. The Gleadow Creek Forest Area is located 12 km northwest of St Marys and comprises the southern part of the Avenue River forest reserve and includes an area from Mount Nicholas road to Gleadow Creek. This area is located approximately 1 km (direct line) from the nearest drill hole (SLK16). Proposed drilling activities will not take place within these areas (including access) and therefore neither area will be impacted by the proposed drilling activities.

## Other environmental constraints

A review of the Tasmania geoconservation sites database indicated the presence of one geosite within the Silkstone exploration lease. The site, Upper Durham Creek Karst System (geosite identification number 2136) is a listed site and described as:

*'Karst features in Permian Limestone. Karst features in limestone horizon on the northern slopes of Mt Durham and Mt Nicholas. Notable features include a cave and limestone gorge on upper Durham Creek'.*

The entire area defined as the geosite is relatively small (approximately 26 m<sup>2</sup>) and located more than 1 km north (direct line) from the nearest proposed drill site. The site is located on the northern side of the Mount Nicholas road, while all proposed drilling activities (including access) will be located south of the road. No impact by the proposed drilling program to the geosite is considered likely due to the location of the proposed drilling sites and the small scale of drilling activities.

No other environmental constraints were identified during the desktop and field searches.

## Discussion

### Management and mitigation measures

Minimal environmental impacts are expected as a result of the proposed drilling program due to the small scale and short-term nature of drilling activities. All drilling activities will be located within land classified as permanent timber production zone with evidence of historic and active forestry practices noted during the site assessment. The proposed drill sites have all been sited on previously cleared land and access to the sites is via existing forestry tracks. Only minor clearing of some regrowth will be required as part of drill site establishment and some maintenance of the forestry tracks will be required. During the site assessment no significant vegetation clearing was identified as being required. A number of small pine trees may need to be cleared at the SLK22 drill site. These trees appear to be part of the neighbouring timber plantation and consequently, the managers of this plantation will be contacted to discuss proposed drilling activities and clearing requirements. Photographs provided in Appendix A show the extent of clearing required.

Only one small catchment pond was located near any of the Silkstone drill sites (SLKDDH01). The location of this drill site was adjusted slightly and located downstream of the water body to ensure no impacts occur as a result of drilling activities. All contractors will be made aware of the water body and the importance of protecting it. Bunding and diversion drains are not considered necessary for any of the proposed drill sites (including SLKDDH01) due to their locations on relatively level ground with minimal catchment areas, however they will be used where necessary. Sumps (or tanks) will be used to contain drill fluids and water encountered during drilling.

Drilling activities will be coordinated to avoid wet periods, however in the event that rainfall events are encountered during drilling, temporary diversion drains and/or bunding around the sites will be implemented to ensure no off-site releases of water and to divert clean water around the site. Adequate freeboard on all sumps (or tanks) will be maintained to ensure adequate capacity is available during rain events. Water required for drilling activities will be imported to site or obtained via agreement with a nearby landholder.

All exploration activities, including preparation and rehabilitation of drill sites will be conducted in accordance with the MRT's Mineral Exploration Code of Practice and is considered adequate for the works proposed. All contractors will be provided with a copy of the approved work program and maps showing where activities are to occur. Contractors will be made aware of their obligations to comply with the Code of Practice and adopt standard industry practices to minimise environmental impacts. Standard industry practices for exploration drilling will be conducted and include, but are not limited to:

- limiting vehicle movements during wet conditions to minimise damage to access tracks;
- on-going liaison with any identified landholders to discuss site access, drilling activities and appropriate rehabilitation criteria;

- washing down of vehicles prior to access site to prevent the introduction and spread of weeds;
- minimising the volume of hydrocarbons and chemicals held at the drill site. Any hydrocarbons and chemicals will be stored and handled in accordance with material safety data sheets and appropriate bunding provided (taking into consideration rainfall);
- maintaining spill clean-up materials on the drill site and used in the event of spills;
- all wastes generated through drilling and ancillary activities will be contained in closed bins (to prevent attracting introduced animals) and removed from site. Wastes will be recycled to the extent possible and wastes not able to be recycled will removed and disposed of appropriately;
- drilling will occur during daytime periods only to minimise potential impacts (for example noise);
- inspections of drill sites and operations will be conducted by senior personnel (contract or Imperial Coal) throughout the drilling program to ensure compliance with the approved work program and Mineral Explorations Code of Practice; and
- drill sites will be sited on flat areas, on slight elevations where possible to limit catchment areas and inundation during heavy rainfall.

## Rehabilitation

All drilling activities will be short-term with most open holes completed within a day and diamond drill holes completed within ten days (site conditions dependent). Given the short-term nature of drilling activities and the location of sites in previously cleared areas, impacts to the environment will be minimised and rehabilitation conducted as soon as possible following completion of drilling. Following drilling activities, the land will continue to be used for timber production and as such this land use will form the objectives of the rehabilitation criteria.

Rehabilitation will be conducted in accordance with the Mineral Explorations Code of Practice and as a minimum will include:

- removing all sample bags, drill core and other waste materials at completion of drilling activities;
- all drill collars will be secured and drill holes no longer required for future exploration activities will be sealed. Temporary caps will be used where holes are required for future activities;
- any sumps constructed will be emptied and backfilled with excavated materials;
- any topsoil removed from the drill pads as part of site preparation works will be spread over the site and scarified to promote regrowth; and
- inspections will be conducted following rehabilitation to ascertain

that the sites are stable and no further works (for example maintenance) is required.

## Conclusion

All proposed drilling activities will occur on previously cleared land within land zoned for permanent timber production. Access will be via existing forestry tracks with some maintenance works required to remove vegetation regrowth for access by drill rigs. Overall, minimal impact to the environment is considered likely as a consequence of the proposed drilling activities. No listed species will be impacted by the proposed drilling activities due to the short-term and small scale of activities. The listed reserves and geosite within the exploration lease will not be accessed and consequently will not be impacted by the drilling program. Conducting all activities in accordance with the Mineral Explorations Code of Practice and best practice and the approved work program are considered adequate to minimise potential environmental impacts.

## Appendices

## Appendix A. Drill site photographs



Plate 1. Location of drill site SLKDDH01. Note cleared vegetation. No further clearing will be required, only minor earthworks to level ground.

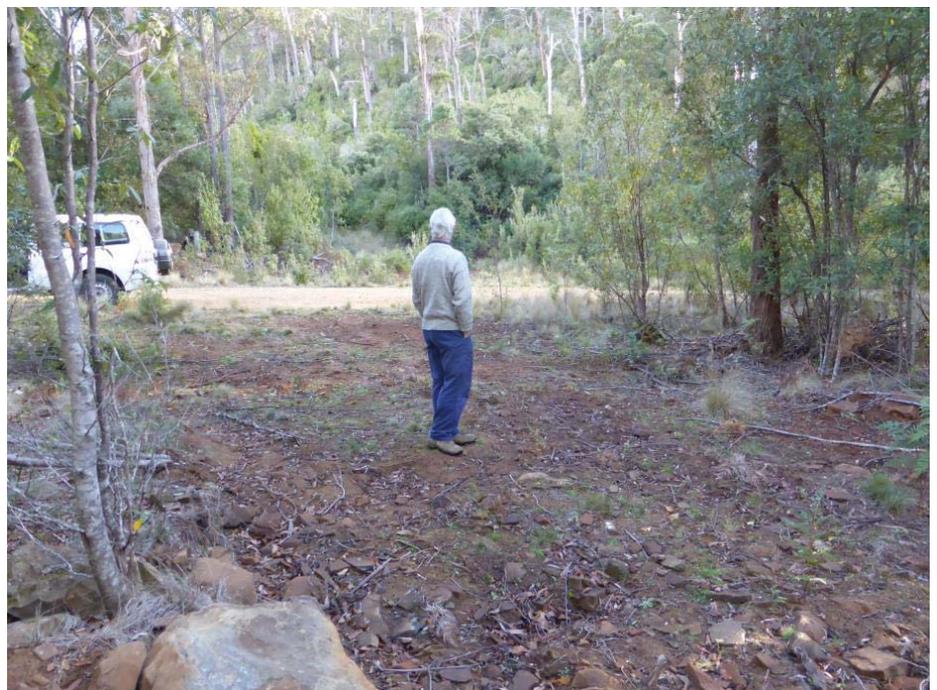


Plate 2. Location of drill site SLKDDH01 showing access track in background

APPENDIX A



Plate 3. Existing access track for SLKDDH01 drill site



Plate 4. Small water catchment located in the vicinity of SLKDDH01. Drill site relocated downstream and across the access road to ensure no impact to the pond

APPENDIX A



Plate 5. Location of proposed SLK04 drill site (diamond drill hole)



Plate 6. Location of proposed SLK04 drill site, note small amount of vegetation to be cleared in foreground (right hand side only). Vegetation in background will not be cleared

APPENDIX A



Plate 8. Location of proposed SLK04 drill site showing small amount of clearing required. Note trees in background will not be cleared



Plate 9. Existing access track to SLK04 drill site

APPENDIX A



Plate 10. Location of proposed SLK12 drill site



Plate 11. Location of proposed SLK12 drill site. Note minor vegetation to be cleared (acacia in foreground and small shrub in middle of photograph). Trees in background will not be cleared

APPENDIX A



Plate 12. Minor erosion channel located on side of access to drill pad. Bunding may be required along this channel to prevent further erosion/damage



Plate 13. Existing access track to SLK12 drill site

APPENDIX A



Plate 14. Location of proposed SLK16 drill site. Drill site will be located in foreground and no clearing of trees in background will be required



Plate 15. Location of proposed SLK16 drill site showing level of ground-cover.

APPENDIX A



Plate 16. Existing forestry track for accessing SLK16 drill site. Maintenance to some sections of track will be required (clearing of regrowth over track)



Plate 17. Location of proposed SLK22 drill site. Pad to be located on left hand side of photo, next to existing track. Note active pine plantation surrounding drill site location

# APPENDIX A



Plate 18. Siting of drill site will require removal of some small pine trees

**Appendix B. Desktop Study Results**

Table 1. Protected Matters

Common Name	EPBC Act	EPBC protected matters species or species habitat	Nature conservation Act 2002 (Schedule 3A)	Threatened Ecological Communities	Register of the National Estate (RNE)	State and Territory reserves	Natural Values Atlas (NVA)	DW-PIPE: List	Geoconservation Site	DES Likelihood of occurrence within Silkstone proposed drill sites
Gleadow Creek Forest Area					Indicative					
Avenue River						x				
Nicholas Range						x			State listed	
Inofrmal reserve on State forest or forestry Tas managed land						x				
Permanent timber production zone (central north (Public land)										
Alpine Sphagnum Bogs and Associated Fens	e	May occur	x	Yes						Unlikely
Lowland Native Grasslands of Tasmania	cr			Yes						Unlikely

e = endangered  
v = vulnerable  
cr = critically endangered  
x = listed

**Appendix B. Desktop Study Results**

Table 2. Fauna species of conservation significance

Species Name	Common Name	EPBC Act	EPBC protected matters species or species habitat	EPBC protected matters species or species habitat	EPBC protected matters Breeding	Threatened Species Protection Act 1995	Invasive species	Natural Values Atlas (NVA)	DW-PIPE: List	Other Databases and literature	DES Likelihood of occurrence with-in Silkstone proposed drill sites
<i>Tasmanipatus anophthalmus</i>	Blind Velvet Worm	e		Likely				x	x		Unlikely
<i>Antipodia chaostola leucophaea</i>	Tasmanian Chaostola Skpper	e		Likely							Unlikely
<i>Litoria raniformis</i>	Southern Bell Frog	v		Likely						x	Unlikely
<i>Galaxiella pusilla</i>	Eastern Dwarf Galaxias	v		Likely							Unlikely
<i>Prototroctes maraena</i>	Australian Grayling	v		May occur							Unlikely
<i>Dasyurus maculatus maculatus</i>	Spotted-tail Quoll	v		Known				x	x	x	Possible
<i>Perameles gunni gunnii</i>	Eastern Barred Bandicoot	v		Likely							Possible
<i>Sarcophilus harrisii</i>	Tasmanian Devil	e		Likely				x	x	x	Possible
<i>Felis catus</i>	Domestic Cat			Likely			x				Possible
<i>Canis lupus familiaris</i>	Domestic Dog			Likely			x				Possible
<i>Capra hircus</i>	Goat			Likely			x				Possible
<i>Lepus capensis</i>	Brown Hare			Likely			x				Likely
<i>Mus musculus</i>	House Mouse			Likely			x				Likely
<i>Oryctolagus cuniculus</i>	European rabbit			Likely			x				Possible
<i>Vulpes vulpes</i>	Red Fox			Likely			x				Possible

e = endangered  
v = vulnerable  
m = migratory  
x = listed  
MT = migratory terrestrial  
MM = migratory marine

**Appendix B. Desktop Study Results**

Table 2. Fauna species of conservation significance (continued)

Species Name	Common Name	EPBC Act	EPBC protected matters species or species habitat	EPBC protected matters species or species habitat	EPBC protected matters Breeding	Threatened Species Protection Act 1995	Invasive species	Natural Values Atlas (NVA)	DW-PIPE: List	Other Databases and literature	DES Likelihood of occurrence within Silkstone proposed drill sites
<i>Aquila audax fleayi</i>	Wedge-tailed Eagle	e			Likely			x	x	x	Possible
<i>Ceyx azureus diemenensis</i>	Tasmanian Azure Kingfisher	e		May occur							Unlikely
<i>Botaurus poiciloptilus</i>	Australasian Bittern	e		May occur							Unlikely
<i>Lathamus discolor</i>	Swift Parrot	e	M	May occur							Possible
<i>Pterodroma leucoptera leucoptera</i>	Gould's Petrel	e		May occur							Unlikely
<i>Tyto novaehollandiae castanops</i>	Masked Owl	v		Known				x	x		Possible
<i>Apus pacificus</i>	Fork-tailed Swift		MM, M	Likely							Unlikely
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle		MT, M	Known				x	x		Possible
<i>Hirundapus caudacutus</i>	White-throated Needletail		MT, M	Known							Unlikely
<i>Myiagra cyanoleuca</i>	Satin Flycatcher		MT, M	Known							Possible
<i>Ardea alba</i>	Great Egret		MW, M	Likely							Unlikely
<i>Ardea ibis</i>	Cattle Egret		MW, M	Likely							Unlikely
<i>Gallinago hardwickii</i>	Latham's Snipe		MW, M	May Occur							Unlikely
<i>Alauda arvensis</i>	Skylark			Likely			x				Possible

MT = migratory terrestrial  
 MW = migratory wetlands  
 M = migratory  
 x = listed

**Appendix B. Desktop Study Results**

Table 2. Fauna species of conservation significance (continued)

Species Name	Common Name	EPBC Act	EPBC protected matters species or species habitat	EPBC protected matters species or species habitat	EPBC protected matters Breeding	Threatened Species Protection Act 1995	Invasive species	Natural Values Atlas (NVA)	DW-PIPE: List	Other Databases and literature	DES Likelihood of occurrence within Silkstone proposed drill sites
<i>Anas platyrhynchos</i>	Mallard			Likely			x				Unlikely
<i>Carduelis carduelis</i>	European Goldfinch			Likely			x				Unlikely
<i>Carduelis chloris</i>	European Greenfinch			Likely			x				Unlikely
<i>Columba livia</i>	Rock Pigeon			Likely			x				Possible
<i>Passer domesticus</i>	House Sparrow			Likely			x				Unlikely
<i>Streptopelia chinensis</i>	Spotted Turtle-Dove			Likely			x				Unlikely
<i>Stumus vulgaris</i>	Common Starling			Likely			x				Unlikely
<i>Turdus merula</i>	Common Blackbird			Likely			x				Possible

x = listed

**Appendix B. Desktop Study Results**

Table 3. Flora species of conservation significance

Species Name	Common Name	EPBC Act	EPBC protected matters species or species habitat	EPBC protected matters species or species habitat	EPBC protected matters Breeding	Threatened Species Protection Act 1995	Invasive species	Natural Values Atlas (NVA)	DW-PIPE: List	Other Databases and literature	DES Likelihood of occurrence within Silkstone proposed drill sites
<i>Lepidium hyssopifolium</i>	Basalt Pepper-cress	e		Likely		r					Unlikely
<i>Epacris exserta</i>	South Esk Heath	e		Likely		e					Unlikely
<i>Plantago debilis</i>						r		x	x		Unlikely
<i>Boronia hemichiton</i>	Mt Arthur Boronia	v		May occur							Unlikely
<i>Caladenia caudata</i>	Tailed Spider-orchid	v		May occur						x	Unlikely
<i>Pellaea calidirupium</i>						r		x	x		Unlikely
<i>Asplenium trichomanes ssp. trichomanes</i>						v		x	x		Unlikely
<i>Prasophyllum apoxychilum</i>	Tapered Leek-orchid	e		May occur				x	x		Unlikely
<i>Prasophyllum incurvatum</i>	Golfers Leek-orchid	cr		May occur				x	x		Unlikely

e = endangered  
r = rare  
v = vulnerable  
x = listed

**Appendix B. Desktop Study Results**

Table 3. Flora species of conservation significance (continued)

Species Name	Common Name	EPBC Act	EPBC protected matters species or species habitat	EPBC protected matters species or species habitat	EPBC protected matters Breeding	Threatened Species Protection Act 1995	Invasive species	Natural Values Atlas (NVA)	DW-PIPE: List	Other Databases and literature	DES Likelihood of occurrence within Silkstone proposed drill sites
<i>Chrysanthemoides monilifera</i>	Bitou Bush			Likely			x				Unlikely
<i>Cytisus scoparius</i>	Broom			Likely			x				Unlikely
<i>Genista monspesulana</i>	Montpellier Broom			Likely			x				Unlikely
<i>Lycium ferocissimum</i>	African Boxthorn			Likely			x				Unlikely
<i>Rubus fruticosus aggregate</i>	European Blackberry			Likely			x				Unlikely
<i>Salix spp.</i>	Willows except weeping, pussy and Sterile Pussy Willow			Likely			x				Unlikely
<i>Ulex europaeus</i>	Gorse			Likely			x				Unlikely
<i>Asparagus asparagoides</i>	Bridal Creeper			Likely			x				Unlikely

x = listed

APPENDIX C

## N Overdevest

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**From:** Marshall, Adam (Heritage) <Adam.Marshall@heritage.tas.gov.au>  
**Sent:** Wednesday, 11 June 2014 12:13 PM  
**To:** noverdevest@tpg.com.au  
**Subject:** AHTP999 - Aboriginal Heritage Desktop Assessment - Silkstone Exploration - Donato Environmental Services  
**Attachments:** Unanticipated Discovery Plan official (SeptemberV2).pdf

---

**RE: ABORIGINAL HERITAGE DESKTOP ASSESSMENT**  
**Silkstone Exploration - Donato Environmental Services**

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Dear Noelle

Aboriginal Heritage Tasmania (AHT) has completed a search of the Tasmanian Aboriginal Site Index (TASI) regarding the proposed drilling program near St Marys and can advise that there are no Aboriginal heritage sites recorded close to the proposed works areas. Due to a review of previous reports and the nature of the proposed works it is believed that the area has a low probability of Aboriginal heritage being present.

Accordingly there is no requirement for an Aboriginal heritage investigation and AHT have no objection to the project proceeding.

Please be aware that all Aboriginal heritage is protected under the *Aboriginal Relics Act 1975*. If at any time during works you suspect Aboriginal heritage, cease works immediately and contact AHT for advice. Attached is an Unanticipated Discovery Plan, which you should have on hand during ground disturbing works, to aid you in meeting your requirements under the Act should Aboriginal Heritage be uncovered.

If you have any queries please do not hesitate to contact AHT.

Kind Regards,

**Adam Marshall**  
**Aboriginal Heritage Advisor**  
**Aboriginal Heritage Tasmania**  
Department of Primary Industries, Parks, Water and Environment  
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# Unanticipated Discovery Plan

## For proponents and consultants dealing with Aboriginal Heritage in Tasmania

This paper provides a Plan that should be followed when dealing with unanticipated discoveries of Aboriginal Cultural Heritage such as sites and objects. The plan provides guidance to project personnel so that they may meet their obligations with respect to Aboriginal heritage in accordance with the *Aboriginal Relics Act 1975* and the *Coroners Act 1995*.

The Unanticipated Discovery Plan is in two sections. The first section primarily explains mitigation strategies that should be employed when any Aboriginal Cultural Heritage sites or items are discovered excluding skeletal remains (burials), while the second process deals specifically with skeletal remains (burials).

### Discovery of Cultural Heritage Items

- Step 1: Any person who believes they have uncovered Aboriginal Cultural Heritage material should notify all employees or contractors that are working in the immediate area that all earth disturbance works must cease immediately.
- Step 2: A temporary 'no-go' or buffer zone of at least 10m x 10m should be implemented to protect the suspected Aboriginal Cultural Heritage site or relics. No unauthorised entry or works will be allowed within this 'no-go' zone until the suspected Aboriginal Cultural Heritage relics have been assessed by a recognised Aboriginal Heritage Officer or Archaeologist.
- Step 3: Aboriginal Heritage Tasmania (AHT) in Hobart (ph 6233 6613) needs to be notified and consulted as soon as possible and informed of the discovery. AHT will then provide further advice in accordance with the *Aboriginal Relics Act 1975*.

### Discovery of Skeletal Material

- Step 1: Call the Police immediately. Under no circumstances should the suspected skeletal remains be touched or disturbed. The area must now be considered a crime scene. It is a criminal offence to interfere with a crime scene.
- Step 2: Any person who believes they have uncovered skeletal material should notify all employees or contractors that are working in the immediate area that all earth disturbance works must cease immediately.
- Step 3: A temporary 'no-go' or buffer zone of at least 50m x 50m should be implemented to protect the suspected skeletal remains. No unauthorised entry or works will be allowed within this 'no-go' zone until the suspected skeletal remains have been assessed by the Police and or Coroner.
- Step 4: Should the skeletal remains be determined to be of Aboriginal origin, the Coroner will contact the Tasmanian Aboriginal Land and Sea Council (TALSC) to arrange for repatriation of the remains, as per the *Coroners Act 1995*.



## **Guide to the most common sites of Aboriginal Significance**

### **Stone Artefact Scatters**

Stone artefacts are the tangible evidence found in regard to past Aboriginal lifeways. Stone artefacts indicate areas that were used by Aboriginal People, either for camping, hunting or other activities such as the manufacture of stone tools. Archaeologists can also determine the duration a site may have been occupied, the amount of times that the site may have been occupied, and the number of people that the area may have supported at any given time.

Some stone artefacts are the result of Aboriginal People fracturing or 'flaking' fine-grained rocks to produce sharp cutting or scraping implements. These were then used, for example, for cutting up animals and then scraping the hides. Volcanic rocks such as basalt were flaked and then ground down to form axes for a number of chopping and cutting tasks. The results of such activities can be seen in the archaeological record (i.e. scatters) in the form of modified stones such as cores, retouched flakes, hammerstones and flaked pieces. From these scatters, by understanding site density and frequency patterns, inferences can be made in relation to past Aboriginal lifeways.

### **Shell Middens**

Shell middens by definition are prehistoric refuse pits. They are the leftover waste of resources exploited which formed the basis of Aboriginal diet. Midden sites can range in size from large mounds to small scatters of shell. Middens usually also contain as well as shell, the remains of animals exploited for food as well as artefacts of stone, bone and shell. These sites are usually found near waterways and coastal areas.

### **Rockshelters**

Rockshelters can either be shelters which contain archaeological deposits from living floors or art rock shelters, and may occur in any area of rocky terrain. Sediments on the floor of the rockshelter can contain preserved stratified deposits of archaeological material. Art types found in rockshelters can vary greatly. It can be in the form of painting, stencils of body parts, tools and equipment, or engravings. Style variations in painting can cover animal or human figurines, supernatural beings, and geometric patterns. Engravings can have similar variations as they can depict tools, humans, human parts, animals and birds and their tracks, geometric patterns and supernatural beings. Pecking is also a form of engraving.

### **Quarries or Stone Procurement Sites**

Quarry sites occur where outliers of suitable tool-making stone appear. A quarry can be generally recognised by evidence of human manipulation and extraction of suitable material and the debris left by the processing of the suitable material. Some quarries can cover vast areas with extremely high amounts of lithic discard. Ochre or pigment was also quarried.

### **Burials**

Burials can occur anywhere, though they are generally found close to areas where there was a high population concentration. Burials can occur where there are soft sediments such as sand hills, they can be found in caves and rockshelters and sometimes they can be associated with hollow trees.