# Construction Environmental Management Plan (CEMP)

# FINAL EIS Revision - 26/09/2023

## Transformer

by Doug Aitken and DarkLab Pty Ltd

328 Lune River Rd Ida Bay

| Version | Edited By | Date |
|---|---|---|
| Draft CEMP - Submissions Report | Chris Males - JMG Engineers and Planners | May 2021 |
| Final EIS Revision | Tim Lathouris, DarkLab Pty Ltd | September 2023 |
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# Section 1 - Project Summary

## 1.1 Executive Summary

The Ida Bay State Reserve has been selected for the installation of a major land-based artwork as part of a State and Federal funding initiative to reinvigorate visitation to the Huon Valley after the 2019 summer fires. The Ida Bay Railway, also located on this site, has a long history of drawing visitors to the state's far south. The proposal comprises the Art Installation and a Visitor Welcome Centre/Café off Lune River Road with the two connected by a walking track. The proposal includes a 32-space car park with additional capacity for bus and recreational vehicle parking and turning.

The business plan anticipates attracting 30,000 people to the site each year, with likely peak daily visitations of 200 people per day, during summer holiday periods. It is anticipated that two permanent staff will be required to manage the operational activities on a regular basis with additional staff engaged based on seasonal demand. The proposed hours of operation for the public are:

10:00am - 5:00pm Summer (Oct - March)

10:00am - 4:00pm Winter (April - September)

The 18.6Ha subject site comprises land at 328 Lune River Road, Ida Bay (PID 5267994). The site is classified as a Visitor Services Zone in the Southport Lagoon Conservation Area Management Plan 2006. The subject site also has a Public Land Classification of "State Reserve" and Parks and Wildlife Service has identified the proposal's Reserve Area Assessment as No. 3854 and categorised the proposal as a Level 4 Activity.

## 1.2 Scope of Plan

The purpose of this Construction Environmental Management Plan (CEMP) is to provide a comprehensive assessment of the potential environmental impacts of the proposal and outline mitigation measures and regulatory frameworks that will be adhered to in order to mitigate or minimise these impacts, on the development site as well as the surrounding lands and waterways. The plan synthesises feedback provided by the Tasmanian Parks and Wildlife Service (PWS) throughout the Environmental Impact Statement (EIS) process with advice provided by the projects design consultancy team, to present a comprehensive assessment of potential environmental impacts resulting from the construction of the Transformer art installation and associated visitor centre and vehicle infrastructure, and how these impacts will be addressed.

It is noted that this plan lays out a commitment from the development's proponent (DarkLab Pty Ltd) to environmental protection of the site and its surroundings. It details the regulatory and accountability framework within which environmental protection measures will be planned and assessed. The proponent will seek the involvement of a principal construction contractor through a competitive tender process, who will be responsible for formulating detailed implementation and control plans which respond to environmental impacts and protection frameworks laid out in this document. An initial response to this CEMP will form part of the assessment criteria for the tendering process. All implementation documents authored in response to this CEMP will be subject to authorisation by the PWS, and other regulatory authorities at the discretion of PWS, prior to any work being undertaken at the site.

## 1.3 Location

The 18.6Ha subject site comprises land at 328 Lune River Road, Ida Bay (PID 5267994). The subject site also has a Public Land Classification of "State Reserve" and is classified as a Visitor Services Zone in the Southport Lagoon Conservation Area Management Plan 2006. The proposal also encompasses land on neighbouring private property at 308 Lune River Rd (PID - 7428595), used for public access, and production forest (crown) land at PID 3391561, used for construction and ongoing service access to the site respectively.

The site contains a mixture of vegetation types including wet heathland (SHW), button grass moorland (MBS), as well as E. Obliqua (DOB) and E Ovata (DOV) dry forest. Underlying geological conditions across the site have been observed to follow vegetation types and are generally shallow underlying weathered bedrock (<500mm) beneath dry eucalypt forest areas and deep soaked clays/gravelly clays >2000mm beneath the heathland and moorland vegetation communities. Development impacts have generally been focussed around the thresholds between dry

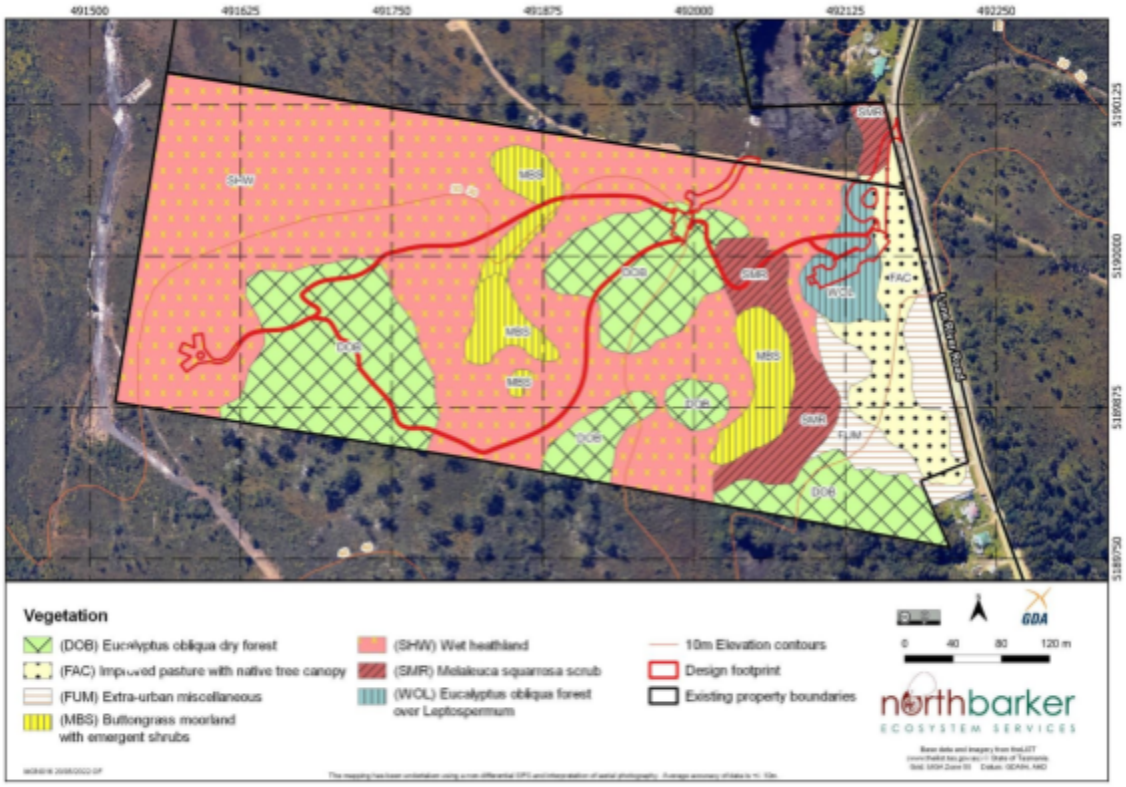


Figure 1 - Tasveg vegetation community mapping, from Transformer Natural Values Assessment

eucalypt and other vegetation communities where underlying surface conditions are suitable for bearing structure while still providing suitable separation distances from conservation significant eucalyptus trees.

The site is also home to the state heritage listed Ida Bay Railway, depot and workers village, site 8215 on the Tasmanian Heritage Council Register. The vehicle entry, car parking and some pedestrian circulation areas sit within Lot 8 on Tasmanian Central Plan Register (CPR) document 10800. The development footprint has been designed to avoid interface with any items of significance listed on THC data sheet 8215. The Transformer art installation and the visitor centre both sit outside of the heritage site. Documentation and process relating to European Heritage can be found in section 3.2 of this document.

The site sits within the municipality of the Huon Valley and is within the following areas of the Tasmanian interim planning scheme overlay;

- Biodiversity protection area (whole site)
- Bushfire prone area (whole site)
- Waterway and coastal protection area (part of the site,
- Scenic Landscape corridor (part of site).

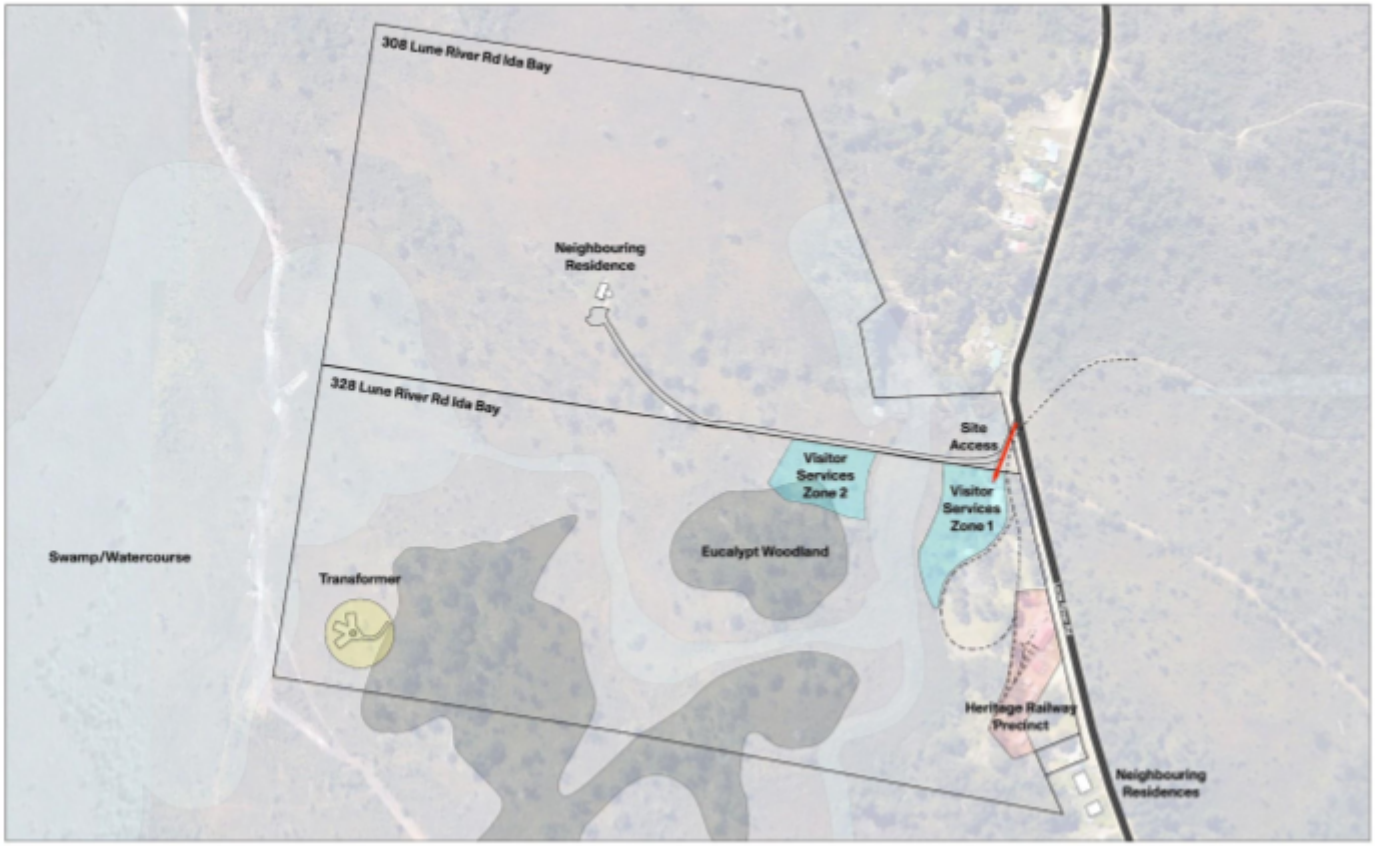


Figure 2 - Site Analysis Plan

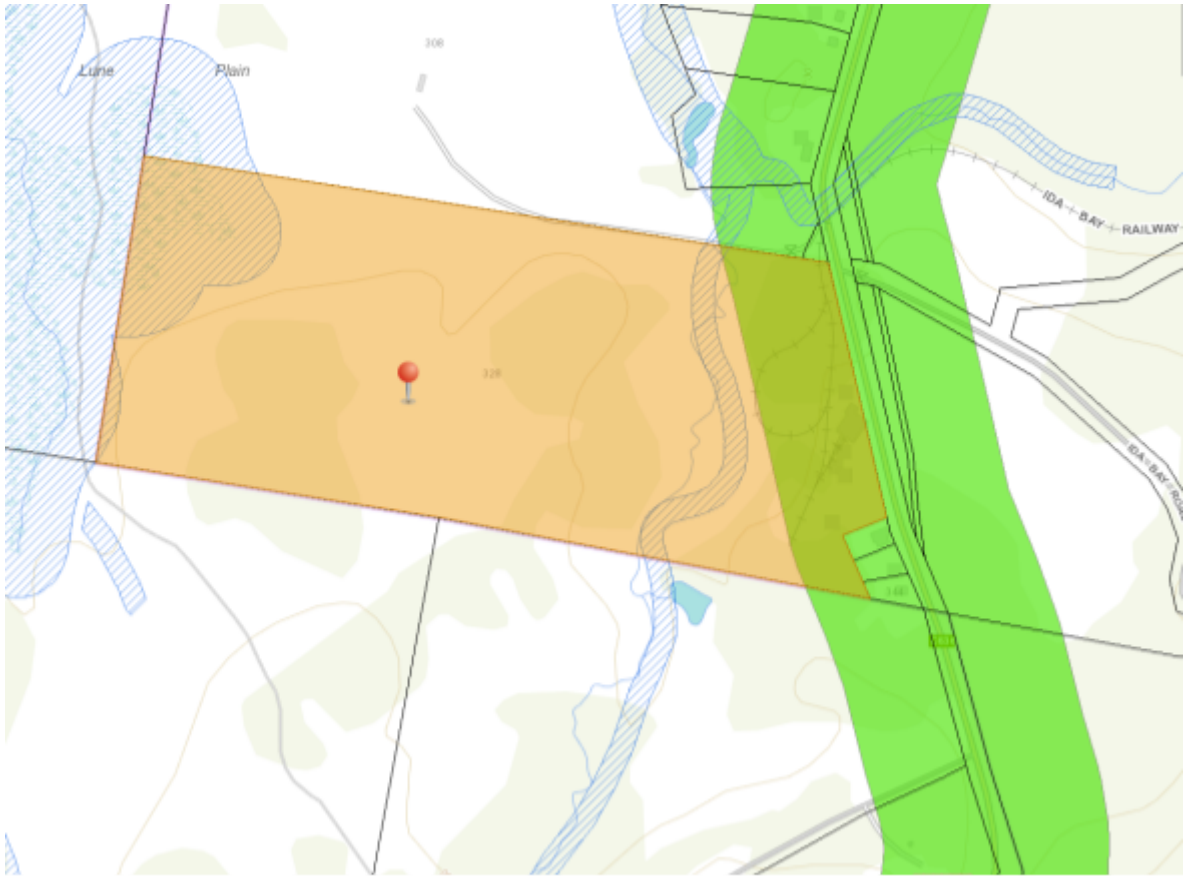


Figure 3 - Interim planning scheme overlay areas

the potential impacts on the state heritage items associated with the Ida Bay Railway, site disturbance created by the building works which have the potential to impact upon aboriginal cultural heritage and geo heritage items, and the potential bird strike. The impacts on the existing heritage items have been considered through a Conservation Management Plan for the site and ameliorated through siting and design. The impacts of site disturbance are minimised through site selection, reuse of existing structures, revegetation and construction management (access rehabilitation, micro-siting etc.). Bird strike has been minimised through flight path analysis and siting/design of structures.

# 1.4 Scope of Works

The Transformer project development construction site exists in 2 distinct areas each with a separate site access route. The visitor services area is at the eastern end of the site and the Transformer art installation area is at the western end of the site. The 2 development zones will be connected by walking track only.

## 1.4.1 Visitor Services Area

The visitor services area of the site contains a 32-space car park with additional capacity for 2 bus and 2 recreational vehicle parking and turning as well as 2 DDA car parking spaces and 2 motorcycles parking spaces. The car park surface will be a mixture of sealed and unsealed surfaces. Areas traversed for heavy vehicle parking and turning will be sealed and areas only accessed by light vehicles will remain unsealed. The car park exists within an area of modification but has been thoughtfully designed to retain as many trees in this area as possible.

Designed by Six Degrees Architects, the visitor centre, with associated amenities food and beverage service, is located approximately 150m to the west of the carpark in an area of DOB dry eucalypt forest. The building is 293m2 with the building envelope measuring 14.4m x 26.6m (excluding some blade walls extending off the north, south and west sides. The exact building location was sited in consultation with the project arborist to be spaced equidistant from a number of trees. The construction method with will be a lightweight construction with a joist and bearer floor ensuring minimal ground contact and penetration and minimising potential for root zone impacts on the surrounding trees.

A raised boardwalk will traverse the watercourse separating the visitor centre and the car park providing an accessible path of travel between these 2 areas. This boardwalk will be constructed using a methodology that minimises impacts on the waterway and vegetation beneath it.

## 1.4.2 Art Installation Area

The Transformer art installation, designed by the Doug Aitken Studio, is a building measuring approximately 500m2 constructed entirely of concrete. The internal walls and ceiling surface are covered in faceted aluminium mirrors and the floor is covered in natural stone paving. The building is set down into the hillside to a maximum depth of approximately 1.5m involving excavation of around 900m3 of spoil. This spoil will be retained on the site for use in backfilling around the structure once complete.
The building has a maximum height above natural surface level of 5.1m. The maximum fill depth is 4.2m and will require a total fill volume in excess of 2000m3 (including the 900m3 of removed spoil).

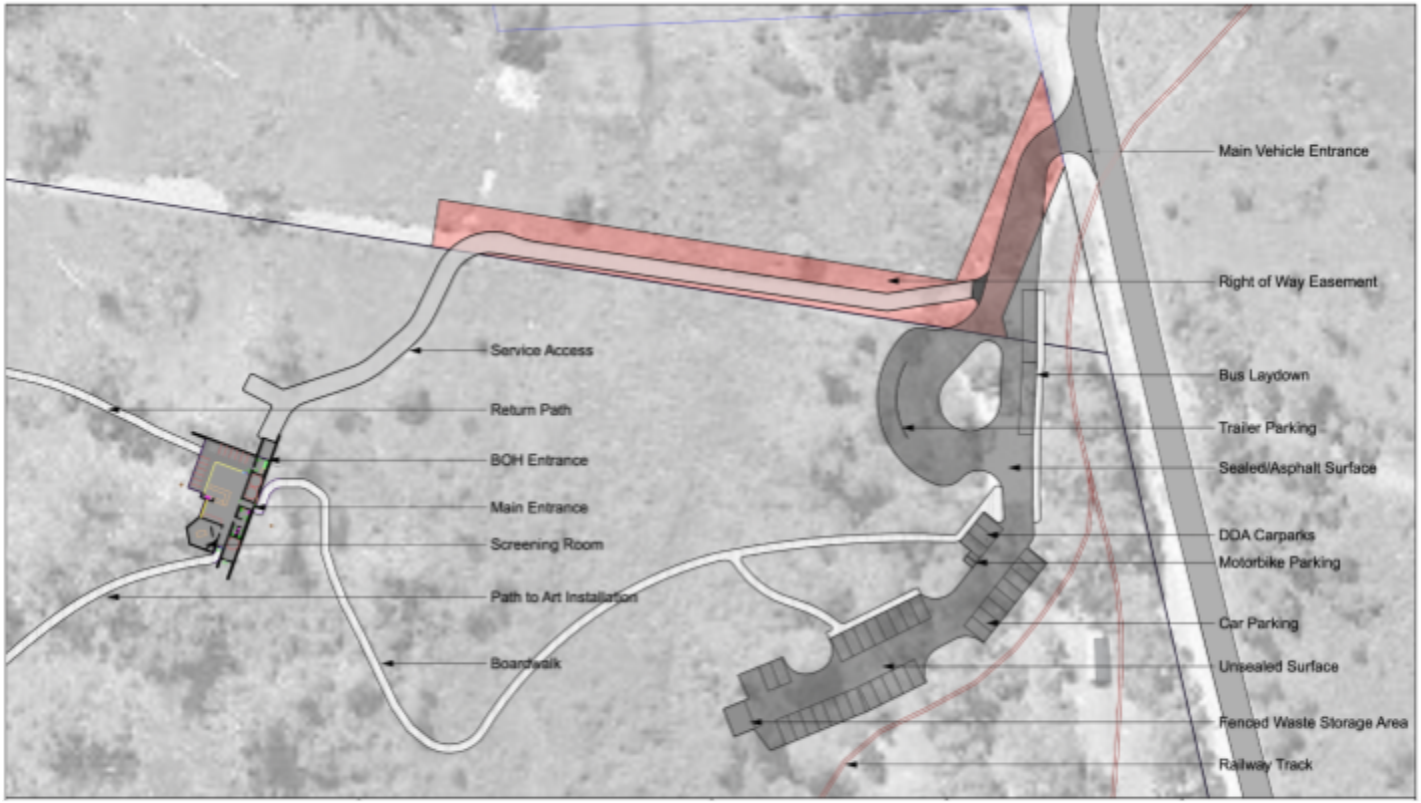


Figure 4 - Site Plan: Visitor Services Zone

## 1.4.2 Walking tracks

In addition to the raised board connecting the carpark to the visitor centre a series of walking tracks will be constructed to create a loop track from the visitor centre to Transformer and back totaling approximately 890 lineal metres. The track will be constructed to a width of 1.8m throughout to allow travel of a small vehicle (golf buggy or similar) along it. Where subsurface conditions allow the track will be constructed of compacted gravel. Boardwalk will be used to traverse particularly wet areas where the gravel construction is unsuitable. The exact route of the path is yet to be determined and will be microsited with the assistance of an ecologist once the project reaches construction.

## 1.5 Site Access

As described above the development is split into 2 distinct construction areas each with their own construction access way.

### 1.5.1 Visitor Centre/ Car Park

To avoid any interface with the existing railway track alignment, or other heritage listed site elements a right of way easement through neighbouring private property at 308 Lune River Road has been established to allow access to 328 Lune River road across its northern boundary. This easement utilises an existing crossover off Lune River Road and upgrades the existing property access to enable construction vehicles to access the both  the visitor centre and carpark site.

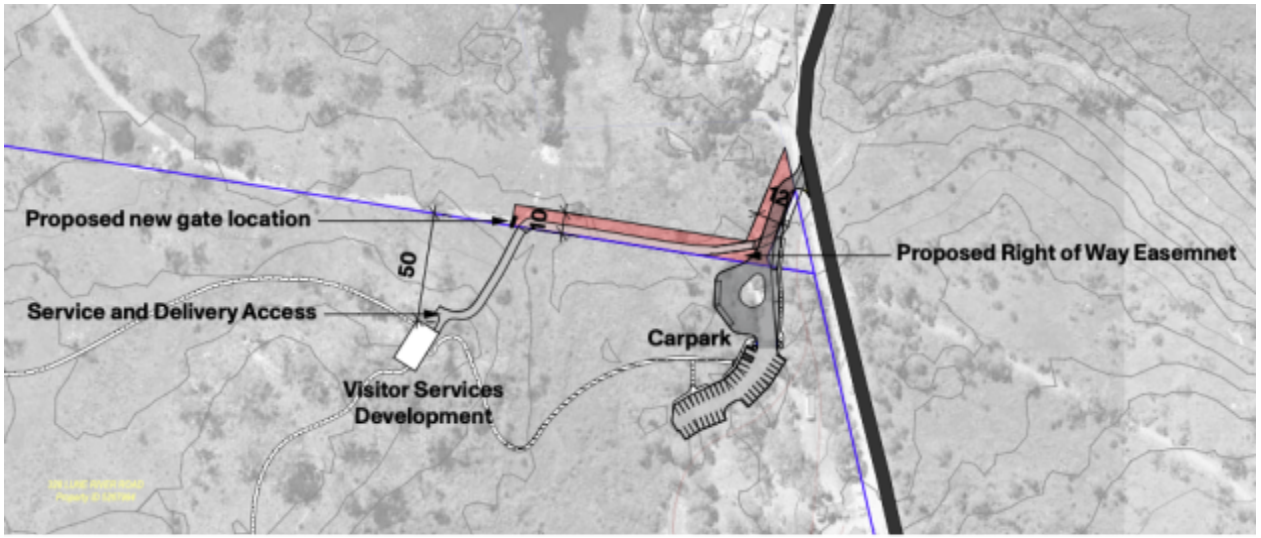


Figure 5 - Right of way easement

## 1.5.2 Transformer Art Installation.

The art installation construction site will be accessed along a fire trail off South Lune Road. The access way is approximately 700m long and traverses through production forest classified land managed by Sustainable Timbers Tasmania (STT) DarkLab has engaged a forest practises officer, Anthony O'Malley to author a forest practices plan (FPP) which acts as a guiding document for the upgrade of this fire trail to a suitable all weather construction access. The FPP designates that the access way is upgraded to meet the class 4 forest road standard.

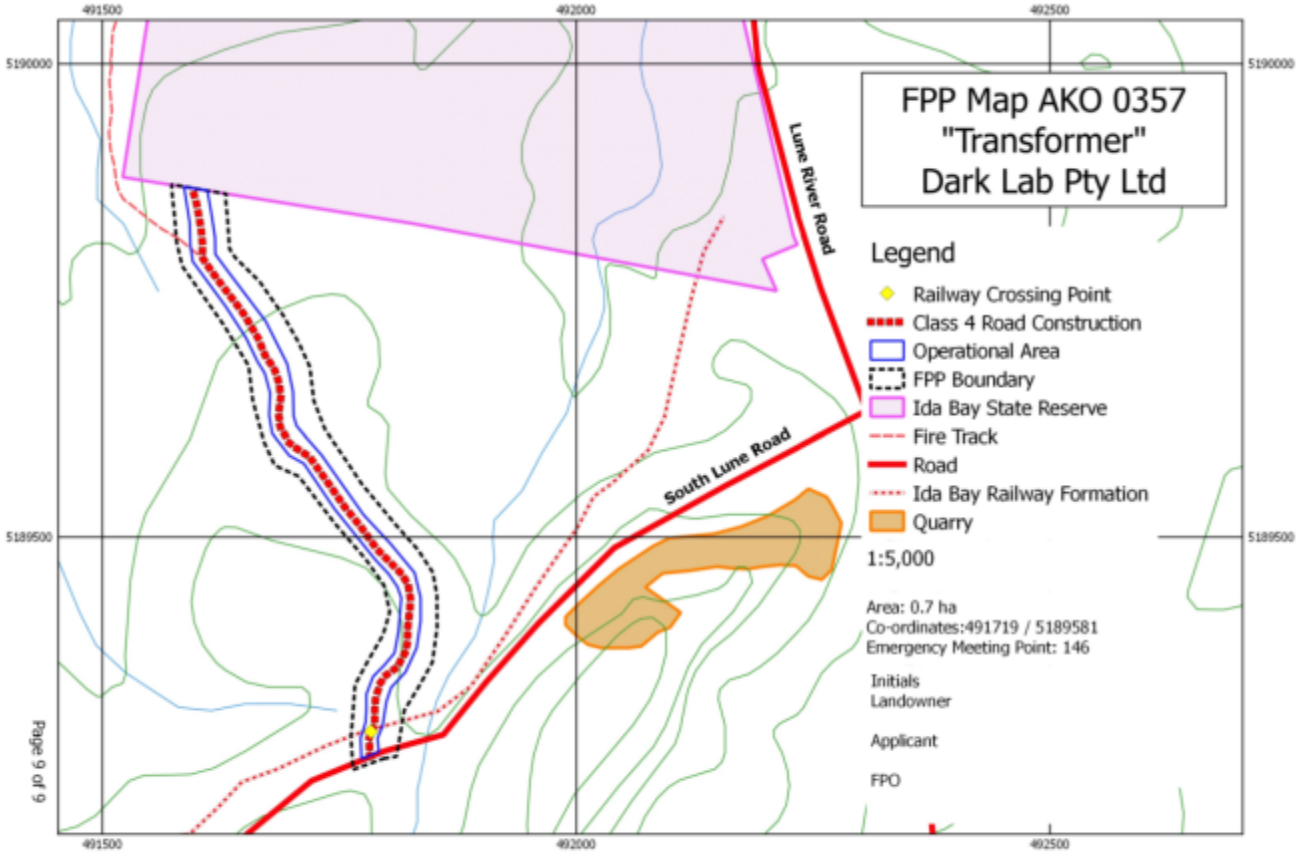


Figure 6 - Forest Practices Plan Map

# Section 2 - Regulatory Framework & Stakeholders

## 2.1 Regulatory/Approval Framework

As the development site is on reserved (crown) land a dual approval process has been undertaken by DarkLab Pty Ltd to gain the relevant approvals to progress the project.
The development application (DA210-2022), through Huon Valley Council, was approved with conditions in May 2023. At time of writing, DarkLab is currently working towards satisfying all the approval conditions ahead of a building permit application to start work on the site.

The Environmental Impact Assessment (EIA) process through PWS has also been undertaken by DarkLab to demonstrate the project's compliance with the Southport Lagoon Conservation Area Management Plan 2006 (SLCAMP), which is seen as the guiding document for all development proposals within the Ida Bay State Reserve.  The SLCAMP is governed by the National Parks and Reserves Management Act of 2002.

## 2.2 Project Stakeholders

The list of stakeholders for the Transformer project is extensive and reaches widely through the Huon Valley Community. For the purposes of this CEMP the below list of project stakeholders has been compiled who will have direct input into or be directly affected by the construction phase of the project

| Stakeholder/Org | Role | Contact Person | Title | Contact Email |
|---|---|---|---|---|
| Tasmanian Parks and Wildlife service | Landowner | Sophie Muller | Director of Tasmanian PWS | sophie.muller@parks.tas.gov.au |
| Sustainable Timbers | Landowner - | Chris Bond | Senior Forest Officer (South) | chris.bond@sttas.com.au |

| | | | | |
|---|---|---|---|---|
| Tasmania | neighbouring property | | | |
| Huon Valley Council | Local Council | Jason Browne | General Manager | jbrowne@huonvalley.tas.gov.au |
| Aboriginal Heritage Tasmania | Aboriginal Heritage Authority | Tony Brown | | Tony.Brown@heritage.tas.gov.au |
| Heritage Tasmania | European Heritage Authority | Russel Dobie | Regional Heritage Advisor (South) | Russell.Dobie@heritage.tas.gov.au |
| Ida Bay Railway Preservation Society | Site tennant | James Shugg | IBRPS steering committee | jamesarthurshugg@icloud.com |
| | Neighbouring landowner | Max Wasllstead | | kailasmax@activ8.net.au |
| DarkLab Pty Ltd | Development Proponent | Tim Lathouris | Project Manager | tim@darklab.net.au |
| DarkLab Pty Ltd | Development Proponent | Leigh Carmichael | Creative Director | leigh@darklab.net.au |

## 2.3 Consultants and designers

The following list of consultants and designed is not exhaustive of everyone who has contributed to the design of the Transformer precinct but does capture all parties who have a design or advice role in ensuring that the location, design and buildability of infrastructure allows it to be constructed in a way that adequately mitigates risk of environmental damage or impact.

| Org/Company | Role | Contact Person | Contact Email | Project Responsibility |
|---|---|---|---|---|
| JMG Engineers and Planners | Civil Engineering Design | Chris Males | cmales@jmg.com.au | - Civil Engineering Design<br>- Stormwater Management System design |
| Six Degrees | Visitor Centre Architects | Mark Healy | mark.healy@sixdegrees.com.au | - Visitor Centre architecture relating to building impacts on surrounding vegetation |
| North Barker Ecosystem Services | Ecologist | Grant Daniels | gdaniels@northbarker.com.au | - Habitat protection<br>- Vegetation Protection<br>- Weed and pathogen control measure<br>- Environment offsets |
| Element tree services | Consulting Arborist | Alister Hodgeman | alister@elementtree.com.au | - Root protection zone management and advice |
| Geo Environmental Solutions | Wastewater design | John Paul Cumming | jcumming@geosolutions.net.au | - wastewater design and management<br>- Soil testing |
| CHMA | Aboriginal Heritage Consultant | Stuart Hauys | staurt@chma.com.au | - Aboriginal Heritage Assessment |

| | | | | |
|---|---|---|---|---|
| | | | | - Assessment of unanticipated discovery Aboriginal Heritage items |
| Paul Johnston Architects | Heritage Consultant | Paul Johnston | paul@pauljohnstonarchitects.com.au | - Assessment of unanticipated discovery of European Heritage items |

## 2.4 Principal Contractor

DarkLab will engage in a competitive procurement process to appoint a principal contractor to undertake the construction of all infrastructure relating to the Transformer project.
The principal contractor, once appointed, will be responsible for managing environmental impact on the site during construction and will be required to respond to the advice and management measures contained within this document to create actionable management plans and operating procedures to ensure the risk of environmental impact, of the construction, adequately managed.
Management plans created by the principal contractor will be subject to approval by PWS as well as any other statutory authority, at the discretion of PWS, prior to any works being undertaken.
This CEMP will be included as part of the tender package and a response to it as well as an overview of the companies commitment to environmental protection will be required as part of the assessment criteria of the tender process.

# Section 3 - Risk Assessment

The CEMP risk assessment conducted for the project follow the below standard steps of risk assessing

1. Identify hazards and insert detail alongside the hazard
2. Consider all Controls for each hazard and list accordingly. Consider the amount of risk reduction that a proposed control would achieve (a costly control of risk is not appropriate if the risk reduction is not significant)
3. Identify the hierarchical level of each control (As per Schedule 1). Always aim for higher-level controls
4. Using the HSE Risk Assessment Matrix (Schedule 2), calculate the residual risk and insert this score in the 'Risk Score' column
5. Assign a responsible person/s for the implementation of controls for each Job Step/Task
6. Record any relevant statutory/legal requirements and/or guidelines
7. Record the highest hierarchical control achieved

Relevant legal requirements and frameworks considered in this risk assessment include;

- Work Health and Safety Act and Regulations 2012
    - Construction Work
    - How to Manage Health and Safety Risks COP
    - Excavation Work COP
    - Managing Risks of Hazardous Chemical in the workplace COP
    - Managing Risks of Plant in the Workplace COP
    - Managing Noise and Preventing Hearing Loss at Work COP
    - First Aid COP
- Nature Conservation Act 2002
- EPBC Act 1999
- Historic Cultural Heritage Act 1995
- Aboriginal Heritage Act 1975

| Hazard | Control/Project Documentation Reference | Hierarchical level of control | Residual Risk Score | Responsible Persons | |
|---|---|---|---|---|---|
| 3.1 Environmental | | | | | |
| Weed Transfer to/from site | - Environmental Instruction - Site washdown of machines<br>- Plant washdown register<br>- JMG Engineering - Transformer Soil and Water Management plan<br>- Principal contractor to develop soil and water management plan for visitor centre and carpark development zone<br>- Project Natural Values Assessment (NVA) - North Barker Ecosystem Services incl weed eradication process onsite prior to construction<br>- Not to borrow soil rocks or vegetation from other area of the state reserve outside of agreed development footprint. | Isolation | D3 - moderate | Project Supervisor/ Operators | - Tasmanian Washdown Guidelines for Weed and Disease Control |
| Habitat Protection/ Disturbance | - Pre-clearance survey prior to onsite works of wombat and Tasmanian Devil burrows.<br>- Pre-clearance survey prior | Isolation | D3 High | Project Manager & Project Supervisor | - Native Conservation Act<br>- EPBC Act |

| Hazard | Control/Project Documentation Reference | Hierarchical level of control | Residual Risk Score | Responsible Persons | |
|---|---|---|---|---|---|
| | to onsite works for threatened flora,<br>- NVA recommendations;<br>○ Pre - preseason check of foraging trees (E Ovata) for flowering potential<br>○ Utilisation survey of swift parrot habitat trees within where food plants onsite are flowering<br>○ Construction exclusion zone around in use habitat trees<br>○ Apply micrositing approach to positioning of walking tracks to avoid conservation significant habitat features. | | | | |
| Native vegetation (trees & shrubs) disturbance | - Mark the location of known habitat features and protection areas as 'no go' areas<br>- Mark tree/root protection zones around remaining trees in development zone<br>- Minimise depth of excavation and ground preparation in carpark and | Isolation | E3 Moderate | Project Manager & Project Supervisor/ Operators/ Operations Manager | - Work Health & Safety Act & Regulations<br>- Managing Risks in the Workplace<br>- Native Conservation Act<br>- EPBC Act |

| Hazard | Control/Project Documentation Reference | Hierarchical level of control | Residual Risk Score | Responsible Persons | |
|---|---|---|---|---|---|
| | visitor centre zone to avoid/minimise root zone impacts<br>- Avoid clearance of vegetation outside of designated development zone<br>- Clearly mark boundaries of work zone<br>- Establish ancillary areas for materials & machinery 'laydown' in already cleared zones (where possible)<br>- Minimise disturbance/works during the (Swift Parrot) breeding season where possible.<br>- No borrowing soil, rocks or vegetation from any area of the state reserve outside of the agreed development footprint. | | | | |
| Sediment and erosion control measures | - Soil and water management plans for all development locations to be approved by regulatory authorities prior to works beginning on site.<br>- Silt fencing should be placed downslope of works (to prevent sediment drainage impacts) | Engineering | E3 Moderate | Engineer & Project Supervisor | - DPIPWE – Soil and Water Management on Sites<br>- |

| Hazard | Control/Project Documentation Reference | Hierarchical level of control | Residual Risk Score | Responsible Persons | |
|---|---|---|---|---|---|
| Landscape Rehabilitation | - Salvage site specific soil<br>- Storage of specific site soil at shallow depths to preserve seed bank<br>- Plants of local provenance to be propagated by division and from collected seed, to be used for onsite plantings<br>- Thatch and mulch form cleared vegetation to be used to cover/rehabilitate areas of disturbance<br>- Minimise the importation of mulch, topsoil and plants onto the site as much as possible. | Administrative | D3 Moderate | Engineer, Landscape Architect, project supervisor | - Native Conservation Act |
| Damage to wetland/waterway during construction of boardwalk | - Boardwalk management plan to be developed detailing construction methodology and impact minimisation measures | Engineering | E3 Moderate | Engineer, Landscape architect, project supervisor | - DPIPWE – Soil and Water Management on Sites<br>- Native Conservation Act<br>- EPBC Act |
| Light pollution during construction | - Minimise any work being conducted outside of daylight hours<br>- If required, directional lighting should be used | Isolation | D2 Low | Project Manager, Project Supervisor | - Native Conservation Act<br>- EPBC Act |

| Hazard | Control/Project Documentation Reference | Hierarchical level of control | Residual Risk Score | Responsible Persons | |
|---|---|---|---|---|---|
| | to illuminate tasks<br>- No lighting be be left on when the site is non-operational | | | | |
| 3.2 Heritage- incl Aboriginal, European, Geological | | | | | |
| - Disturbance of archaeological artefacts and/or relics during excavation and site clearing | - Photographic extant recorded during demolition (prior to removal<br>- Enact the Unanticipated Discovery Plan procedures for the management of unanticipated discoveries of Aboriginal relics in Tasmania | Administrative | E3 Moderate | Project Manager& Project Supervisor/ Operators/ Operations Manager | - Aboriginal Heritage Act 1975<br>- Coroners Act 1995<br>- Historic Cultural Heritage Act 1995 |
| - Damage to existing heritage assets | - No construction works to be conducted within the vicinity of conservation significant heritage assets. | Elimination | E2 Low | Project Manager& Project Supervisor/ Operators/ Operations Manager | - Historic Cultural Heritage Act 1995 |
| - Damage or removal of currently undiscovered European Heritage items. | - Unanticipated discovery plan in place for management of unanticipated discovery of European Heritage items.<br>- signage associated with the carpark should be only as necessary and directional | Administrative | C2 Moderate | Project Manager& Project Supervisor/ Operators/ Operations Manager | - Historic Cultural Heritage Act 1995 |

| Hazard | Control/Project Documentation Reference | Hierarchical level of control | Residual Risk Score | Responsible Persons | |
|---|---|---|---|---|---|
| | signage should be minimised and designed at a low level | | | | |
| - Damage or removal of currently undiscovered geological diversity values | - Unanticipated discovery plan in place fort management of unanticipated geological diversity to include;<br>○ Training of on-ground personnel to enable recognition of any fossil or gem material<br>○ An agreed routine for inspecting the excavations for evidence of such material<br>○ An agreed procedure should any fossil or gem material be discovered, noting that where practical any finds should be left in situ and referred for expert advice<br>○ If fossil and/or gem material is uncovered at the site then a suitably | Administrative | D3 Moderate | Project Manager& Project Supervisor/ Operators/ Operations Manager | - Historic Cultural Heritage Act 1995 |

| Hazard | Control/Project Documentation Reference | Hierarchical level of control | Residual Risk Score | Responsible Persons | |
|---|---|---|---|---|---|
| | qualified and experienced geoscientist should be engaged for inspection to enable data and sample recovery prior to concealment by the artwork structure | | | | |
| 3.3 Personnel | | | | | |
| Unauthorised site access (public) | - Site is secured (adequately fenced to prevent danger to life)<br>- Site supervision<br>- Site warning signage to be placed at all access points<br>- Work will cease if unauthorised visitors come to the site and will not recommence until the site is made safe | Administrative | D3 Moderate | Project Manager & Engineer/Project Supervisor/Operators | - Work Health & Safety Act & Regulations |
| Dangerous goods on site | - Store goods (i.e. fuels, oils) in a designated compound in an appropriate area.<br>- Always store securely<br>- Store appropriately (as per | Isolation | E3 High | Project Manager& Engineer / Project Supervisor/ Operators/ Operations | - Work Health & Safety Act & Regulations<br>- Managing Risks in the Workplace |

| Hazard | Control/Project Documentation Reference | Hierarchical level of control | Residual Risk Score | Responsible Persons | |
|---|---|---|---|---|---|
| | best practice for each good) | | | Manager | |
| Vehicle – vehicle and/or Vehicle – pedestrian interaction during mobilisation/demobilisation | - Flashing lights<br>- Reverse alarms<br>- Safety signage<br>- UHF communications<br>- Licensed, experienced float drivers<br>- New Worksite Assessment<br>- Safe Work Method Statements<br>- Take 5 Risk Assessment<br>- Site Supervision | Engineering | E3 Moderate | Project Supervisor/Operators | - Code of Practice - Managing Risks of Plant in the Workplace |
| Site compound set up: lifting operations- collisions with other equipment/ buildings/ personnel | - Site Supervision<br>- Licensed, competent plant operators<br>- Use slide tray trailer to eliminate the need for lifting operations. Otherwise:<br>- Tagged and tested lifting equipment<br>- Pre-start checklists<br>- Authorised and competent person to control lifting operations<br>- SWMS<br>- Positive communications<br>- Never work under a suspended load<br>- Tag line to be used if required<br>- Spotter to observe lifts and | Elimination | D4 High | Operations Manager/ Project Manager& Engineer / Project Supervisor/ Operators | - Code of Practice – Hazardous Manual Tasks<br>- Code of Practice – Managing Risks of Plant in the Workplace |

| Hazard | Control/Project Documentation Reference | Hierarchical level of control | Residual Risk Score | Responsible Persons | |
|---|---|---|---|---|---|
| | to maintain safe approach distances for electrical infrastructure<br>- Manual Handling Form<br>- Hard hats must be worn whilst working around plant and equipment | | | | |
| Overhead assets: Conductors and/or other electrical infrastructure | - WI-11 Operating Safely Near Power Lines<br>- Licensed/competent operators<br>- Trained operators and spotters where required<br>- New Worksite Assessment<br>- Site Inspection<br>- SWMS<br>- Operators (incl. truck drivers) & spotter to complete pre-start job briefing<br>- Check conductor height against machine working height and safe approach distances<br>- Always maintain the safe approach distances<br>- Always work the machine as low as practicable, minimise working the machine directly under the conductors<br>- The machine operated to | Administration | D3 Moderate | Project Mananger & Engineer/Operator and HSE Team | - Work Health and Safety Act and Regulations<br>- Code of Practice - Managing Risks of Plant in the workplace. |

| Hazard | Control/Project Documentation Reference | Hierarchical level of control | Residual Risk Score | Responsible Persons | |
|---|---|---|---|---|---|
| | minimise the likelihood of vegetation thrown towards overhead lines and other power assets<br>- Risk assess trees /vegetation too close to conductors and hand fell if required<br>- Spotter and operator to maintain positive communications at all times | | | | |
| Traffic Management:<br>- Vehicle to vehicle collision<br>- Vehicle to person collision<br>- Incorrect signage<br>- Long delays<br>- Unsealed sections<br>- Damaged or lost traffic management equipment<br>- Unauthorised access<br>- Inadequate training for personnel<br>- Incorrect TMP | - Site supervision<br>- Licence, competent plant operators<br>- SWMS<br>- Approved traffic Management Plans<br>- Traffic Management risk Assessment<br>- Trained and competent Traffic Controllers<br>- Daily checks of Traffic Management Equipment Site Signage<br>- Mobile Traffic Lights & Variable Messaging Boards<br>- Traffic Movement Plan developed and implemented for the site compound<br>- Safety Bund installed to improve separation | Isolation | D3 Moderate | Project Manager& Engineer/Project Supervisor/Operators | - Work Health & Safety Act & Regs<br>- Traffic Act Road Rules<br>- DSG Traffic Control for Works on Roads<br>- Project Specification AS1742 |

| Hazard | Control/Project Documentation Reference | Hierarchical level of control | Residual Risk Score | Responsible Persons | |
|---|---|---|---|---|---|
| | between HV/LV/Personnel<br>- Stakeholder & Community Engagement Plan | | | | |
| Wet, muddy or slippery ground conditions | - Licensed & competent operators<br>- Site supervision<br>- Daily toolbox meetings to increase awareness<br>- Track & site maintenance<br>- Take 5 | Administration | D2 Low | Project Manager& Engineer / Project Supervisor/ Operators | - Work Health & Safety Act & Regulations |
| Manual handling injuries | - WI-02 Manual Handling<br>- Experienced operators<br>- Appropriate equipment<br>- Supervision<br>- Daily Toolbox meetings to maintain awareness<br>- Be aware of hazardous manual handling tasks e.g. carrying and tying steel, concreting and formwork<br>- Gloves when handling steel<br>- Cover exposed steel with protective caps<br>- Risk Assessment (provider-driven) | Administration | D2 Low | Project Manager& Engineer / Project Supervisor/ Operators | - Code of Practice –<br>- Hazardous Manual Tasks |
| Personal injury, fatigue or dehydration | - Report all hazards, incidents and accidents<br>- Management Policies (of provider)<br>- Project Management and | Administration | D2 Low | Project Manager& Engineer / Operator/ HSE Team | - Work Health & Safety Act & Regulations<br>- Code of Practice - First Aid in the |

| Hazard | Control/Project Documentation Reference | Hierarchical level of control | Residual Risk Score | Responsible Persons | |
|---|---|---|---|---|---|
| | Supervision<br>- Employees are inducted as to their duty of care responsibilities (by provider)<br>- Trained First Aid officer on site<br>- Site PPE requirements – High visibility shirt or vest, safety footwear, hard hat, & safety glasses when required<br>- Adequate drinking water carried | | | | Workplace |
| Incident/injury during power tool use | - All Power tools to be tagged and tested<br>- Tool maintenance<br>- Ear/eye/hand protection<br>- Competent person to check the condition of hand tools/associated equipment before use - powered and manually controlled | PPE | E3 Moderate | Project Supervisor/ Operators/ HSE Team | - Code of Practice – Hazardous Manual Tasks |
| Poor Housekeeping – slip & trip hazards | - Clear demarcation of material storage areas<br>- Designated waste storage bins<br>- Supervision<br>- Regular attention to removing waste from the site<br>- Site HSE inspections | Isolation | D2 Low | Project Manager& Engineer / Project Supervisor/ Operators/ HSE Team | - Work Health & Safety Act & Regulations |

| Hazard | Control/Project Documentation Reference | Hierarchical level of control | Residual Risk Score | Responsible Persons | |
|---|---|---|---|---|---|
| Inadequate Emergency Management procedures and training | - Project Management and Supervision<br>- Report all hazards, incidents and accidents<br>- Site-specific Emergency Response Plan displayed in site office and communicated via site Induction<br>- Minimum 1 Emergency Drill conducted<br>- Trained Emergency Control Officer nominated | Administration | D3 Moderate | Project Manager& Engineer / Project Supervisor/ Operators/ HSE Team | - Work Health & Safety Act & Regulations |
| Inadequate First Aid Personnel / Supplies | - First Aid Risk Assessment conducted as part of the project start-up process<br>- Emergency Services Number and location in ERP (Emergency Response Plan)<br>- Trained First Aider on-site at all times<br>- 2 x Medium Risk First Aid Kits onsite and First Aid kits in LV's<br>- EAP designated and clearly signed | Administration | D2 Low | Project Manager& Engineer / Project Supervisor/ Operators/ HSE Team | - Code of Practice – First Aid in The Workplace |
| | | | | | |

| Hazard | Control/Project Documentation Reference | Hierarchical level of control | Residual Risk Score | Responsible Persons | |
|---|---|---|---|---|---|
| 3.4 Machinery/Plant Usage | | | | | |
| Machine noise | - Pre-employment hearing test<br>- Sound minimising machine cabins<br>- Keep cabin doors shut<br>- Pre start checks<br>- Plant Operator Weekly Safety Checklist<br>- Hours of operation restricted to minimise nuisance to neighbours<br>- Hearing protection available<br>- Site supervision<br>- HSE audits<br>- Periodic hearing tests<br>- Public complaint protocols | Engineering | E2 Low | Project Manager& Engineer / Project Supervisor/ Operators/ HSE | - Work Health & Safety Act & Regulations<br>- Code of Practice – Managing Noise and Preventing Hearing Loss at Work |
| Dust – decreased visibility and increased air borne particles<br>Nuisance dust to adjacent properties<br>Impact on site landscape elements | - Appropriate vehicle speed reductions (on-site)<br>- Dust proof machine cabins<br>- Site Supervision<br>- Daily minuted toolbox meetings<br>- Cabin windows and doors to be kept shut<br>- Stop work if dust prevents safe vision of the work site<br>- Public complaint protocols | Isolation | C1 Low | Project Manager& Engineer / Project Supervisor/ Operators | - Work Health & Safety Act & Regulations |

| Hazard | Control/Project Documentation Reference | Hierarchical level of control | Residual Risk Score | Responsible Persons | |
|---|---|---|---|---|---|
| | - Water Cart/s available if required<br>- Water down working surfaces if required<br>- Minimise stockpiling of material | | | | |
| Plant operations & movement:<br>Striking personnel or equipment damage<br>Reduce (potential) operations impact on fauna | - Licensed & competent operators<br>- Machinery movement alarm & flashing light<br>- Seatbelts in all vehicles/plant<br>- SWMS<br>- Daily plant pre-start checklists<br>- Weekly Safety Checklist<br>- Keep plant doors shut<br>- Site supervision<br>- Daily Toolbox meetings<br>- Positive communications<br>- No person to be within the working radius of a machine unless they have the full attention of the operator<br>- Site warning signage informing others that machinery is in the area and the UHF channel<br>- Site speed limitations<br>- Beware of uneven ground<br>- PPE – high visibility clothing and hard hats | Administration | E3 Moderate | Project Supervisor/ Operators | - Code of Practice – Managing Risks of Plant in the Workplace |

| Hazard | Control/Project Documentation Reference | Hierarchical level of control | Residual Risk Score | Responsible Persons | |
|---|---|---|---|---|---|
| Uneven ground, unconsolidated fill, live edges<br>– plant rollover | - Licensed & competent operators<br>- Seatbelts fitted and worn<br>- ROPS & FOPS<br>- SWMS<br>- Daily plant pre start checklists<br>- Weekly Safety Checklist<br>- Keep plant doors shut<br>- Site Supervision<br>- Daily Toolbox meetings<br>- Take 5 risk assessment<br>- Site speed limitations<br>- Beware of uneven ground<br>- Beware of unconsolidated fill<br>- Work at 45 degrees to the edges of steep banks and slopes if less than 1m from the edge<br>- Never roll closer than one-third of the drum width to an edge or slope on semi- compacted materials<br>- Work in a forward direction when rolling close to edges | Isolation | E3 Moderate | Project Supervisor/ Operators | - Code of Practice – Managing Risks of Plant in the Workplace |
| Excessively "crowned loads" | - Competent, licensed operators<br>- Excavator operator to ensure that loads are not excessive<br>- Excavator will not load over | Administration | D2 Low | Project Supervisor/ Operators | - Work Health & Safety Act & Regulations |

| Hazard | Control/Project Documentation Reference | Hierarchical level of control | Residual Risk Score | Responsible Persons | |
|---|---|---|---|---|---|
| | the cab of trucks at any time | | | | |
| Inadequate communication between operators and/or Contractor base | - Competent, licensed operators<br>- Daily Toolbox meetings<br>- UHF Radios<br>- Mobile phones<br>- Regular job briefings between all stakeholders (in-person & via UHF) | Administration | E2 Low | Project Manager& Engineer / Project Supervisor/ Operators | - Work Health & Safety Act & Regulations |
| Large sections of materials striking persons and/or equipment | - Competent, licensed operators<br>- All cab doors are kept closed at all times during operation<br>- No one permitted outside the cab of their machines during loading operations unless otherwise advised<br>- Safe Work Method Statement<br>- Large sections are not to be placed on top of loads<br>- Keep clear of loaded trucks during break times/leg stretches etc. | Isolation | E3 Moderate | Project Supervisor/ Operators | - Work Health & Safety Act & Regulations |
| Persons being struck or equipment incident caused by material “hanging up” or jamming in tray | - Competent licensed truck drivers<br>- No persons allowed within 10 metres of truck when dumping material | Isolation | E2 Low | Project Supervisor/ Operators | - Work Health & Safety Act & Regulations |

| Hazard | Control/Project Documentation Reference | Hierarchical level of control | Residual Risk Score | Responsible Persons | |
|---|---|---|---|---|---|
| | - Truck not permitted to drive away until the tray has completely lowered unless running gravel on road surfaces<br>- Truck driver to regularly check tray and immediate area around the rear of the truck<br>- Safe Work Method Statement | | | | |
| Plant Fire | - Regular plant maintenance<br>- Pre start checks<br>- Plant Operator Weekly Safety Checks<br>- Fire extinguishers available in plant and site containers<br>- Emergency Management Plan | Administration | E3 Moderate | Project Supervisor/ Plant operators | - Work Health & Safety Act & Regulations |
| Underground assets – Telstra, electrical, water & gas | - Site Inspection<br>- Site Induction<br>- Safe Work Method Statement<br>- DBYD<br>- Establish alignment of buried connection lines before excavation | Administration | D3 Moderate | Project Manager& Engineer / Project Supervisor/ Operators | - Work Health & Safety Act & Regulations |
| Operating close to | - Competent Operators | Administration | D3 Moderate | Operator/ Project | - Work Health & |

| Hazard | Control/Project Documentation Reference | Hierarchical level of control | Residual Risk Score | Responsible Persons | |
|---|---|---|---|---|---|
| steep drops/ unstable ground etc. | - Site Drawings<br>- Operator to conduct a walk around of sight before commencing works to familiarise themselves with the worksite<br>- Established clearance zones set up before operations begin<br>- Take 5 Risk Assessments | | | Manager& Engineer / Site Supervisor | Safety Act & Regulations |
| Lifting operations & Pipe Laying | - New Worksite Assessment<br>- Never work under a suspended load<br>- Always maintain communication with the operator when helping to guide a suspended load<br>- Use of licenced crane operation Contractor with competent crane operators & doggers where required<br>- Tagged/tested Pipe Lifting Tool<br>- Sub-contractor SWMS<br>- Daily Toolbox meetings<br>- Take 5<br>- Use tag lines if required<br>- Excavators with burst control | Substitution | E4 High | Project Manager& Engineer / Project Supervisor/ Operators/ HSE Team | - Work Health & Safety Act & Regulations |
| Rock breaking/Blasting | - Licenced and competent operators | Isolation | E3 Moderate | Project Manager& Engineer / Project | - Work Health & Safety Act & |

| Hazard | Control/Project Documentation Reference | Hierarchical level of control | Residual Risk Score | Responsible Persons | |
|---|---|---|---|---|---|
| | - Maintain safe clearance distance from breaking work<br>- Hearing protection<br>- Safe Work Method Statement<br>- Contractor Hydraulic Rock Breaking Operations<br>- Fit screen to protect from fly rock<br>- Barricades and bunting to maintain a safe distance<br>- Supervision<br>- Communications plan to ensure local area stakeholders are aware of blasting activities | | | Supervisor/ Operators | Regulations<br>- Managing Noise and Preventing Hearing Loss at Work Code of Practice |
| Machine fault | - All equipment to be approved for use by Project Supervisor<br>- All equipment used will be appropriate to undertake the work required<br>- All equipment on site will be within scheduled maintenance parameters<br>- Documented pre-starts will be completed daily<br>- Documented weekly safety checklists<br>- Sub-contractor plant safety checklists<br>- Systematic HSE Inspections | Administration | C1 Low | Project Manager& Engineer / Project Supervisor/ Operators/ Operations Manager | - Code of Practice – Managing Risks of Plant |

| Hazard | Control/Project Documentation Reference | Hierarchical level of control | Residual Risk Score | Responsible Persons | |
|---|---|---|---|---|---|
| Excavated edges/trenches collapsing – equipment or personnel damage | - Site Supervision<br>- Experienced Operators<br>- Safe Work Method Statement<br>- Clearance Zones established as per Code of Practice<br>- Operators to exercise caution around trench edges<br>- Benching of all trenches deeper than 1.5 metres. Benching to commence at 1 metre if trench >1.5 metres<br>- No personnel permitted to go into un benched excavations > 1.5m<br>- All "live edges", steep drops, soft/unstable ground & high faces to be barricaded with appropriate fencing or bunting | Isolation | E3 Moderate | Project Engineer /Project Supervisor/ Operators | - Code of Practice – Excavation Work |
| 3.5 Design + Quality Control | | | | | |
| Defect/fault/quality issue with works | - Project Management Plan<br>- Inspection and Test Plan<br>- Contractor's Integrated Management System<br>- Regular site audits and | Administration | E2 Low | Project Manager / Project Engineer | - Work Health & Safety Act & Regulations |

| Hazard | Control/Project Documentation Reference | Hierarchical level of control | Residual Risk Score | Responsible Persons | |
|---|---|---|---|---|---|
| | inspection based on requirements of Project Management plan and contract specifications | | | | |
| Inadequate Audits and Inspections | - Project Management and Supervision<br>- Competent Operators<br>- Review of health and safety risks in project scope resulting in the need for:<br>- Weekly Job Observations<br>- Monthly Site HSE Inspections<br>- Monthly PMP Audits | Administration | D2 Low | Project Manager& Engineer / Project Supervisor/ HSE Advisor | - Work Health & Safety Act & Regulations |
| Residual Design Risks | - Project Management and Supervision<br>- Competent Operators<br>- Daily toolbox Meetings<br>- Workplace Inspections<br>- Specific design hazards detailed in the DOSG specification to allow controls to be in place:<br>- Traffic Management<br>- Working around overhead power lines | Administration | E3 Moderate | Project Manager/Project Engineer/ Project Supervisor/ Operators | - Code of Practice – Managing the Risks of Plant in the Workplace<br>- Work Health & Safety Act & Regulations<br>- The Tasmanian Traffic Act<br>- The Tasmanian Traffic (Road Rules) Regulations<br>- DSG Traffic Control at Worksites<br>- Project |

| Hazard | Control/Project Documentation Reference | Hierarchical level of control | Residual Risk Score | Responsible Persons | |
|---|---|---|---|---|---|
| | | | | | Specification<br>- AS1742 Manual of Uniform Traffic Control Devices in particular AS1742.3 2009 |
| Contractor Management – unsafe practices/poor workmanship/inadequate resources | - Contractor on-boarding process / conditions of engagement/service brief /contractor registration / contractor induction<br>- Engagement of contractors with 'acceptable' level of risk as per assessments<br>- Provision of relevant PMP and other technical project information to contractors before work commences<br>- Historical understanding of contractors capabilities due to previous works they have undertaken<br>- Project progress meetings – internal and external<br>- Audits and inspections<br>- Site Supervision | Administration | D3 Moderate | Project Manager/Project Engineer/HSE team | - Contractor Management<br>- Project Start Up Questionnaire |

**STEP 1** – Clearly identify the hazard to be assessed

**STEP 2** –Establish a measure of the likely impact/consequence

**STEP 3** – Establish a measure of probability/likelihood

**STEP 4** – Establish the level of risk using the matrix

**STEP 5** – Implement actions appropriate to the level of risk

## SCHEDULE 2 - HSE RISK ASSESSMENT MATRIX

| MEASURE OF PROBABILITY/ | | | MEASURE OF IMPACT/CONSEQUENCE | | | | |
|---|---|---|---|---|---|---|---|
| | | | INSIGNIFICANT (1) | MINOR (2) | MODERATE (3) | MAJOR (4) | CATASTROPHIC (5) |
| | ALMOST CERTAIN | (A) | HIGH | HIGH | EXTREME | EXTREME | EXTREME |
| | LIKELY | (B) | MODERATE | HIGH | HIGH | EXTREME | EXTREME |
| | POSSIBLE | (C) | LOW | MODERATE | HIGH | EXTREME | EXTREME |
| | UNLIKELY | (D) | LOW | LOW | MODERATE | HIGH | EXTREME |
| | RARE | (E) | LOW | LOW | MODERATE | HIGH | HIGH |

NOTE: - This matrix can be used to rank hazards or determine the level of risk of an actual incident/accident. When determining the outcome of a hazard, use this matrix in the "potential situation. When determining the outcome of an accident, incident or illness, use this matrix in the "actual situation.

| PROBABILITY | QUALITATIVE DESCRIPTION |
|---|---|
| Almost Certain | Event is expected to occur in most circumstances. |
| Likely | Event can be expected to occur more than once a year, including continuous emissions. |
| Possible | Event is likely to occur during the project lifecycle. |
| Unlikely | Event could occur at some time, but is not likely here within the project lifetime. |
| Rare | Event may occur only in exceptional circumstances. |

| | |
|---|---|
| EXTREME | Task must not proceed until additional controls have been implemented to reduce the impact/consequence below extreme and as low as reasonably practicable |
| HIGH | Management review required before proceeding. Implement cost effective risk control measures |
| MODERATE | Implement effective risk control measures |
| LOW | Manage by routine procedures. |

# IMPACT/CONSEQUENCE

| | CATEGORY OF CONSEQUENCE | | | | |
|---|---|---|---|---|---|
| | INSIGNIFICANT | MINOR | MODERATE | MAJOR | CATASTROPHIC |
| QUALITATIVE DESCRIPTION | ▪ No injuries, low financial loss<br>▪ No human injuries or health effects<br>▪ Possible incidental impacts to flora & fauna in a locally affected environmental setting<br>▪ No ecological consequences<br>▪ No measurable impacts or financial losses to commercial resources | ▪ First aid treatment, medium financial loss<br>▪ Incidental injury or health effects requiring only first aid treatment or an employee returning to work after a consultation with a doctor. Normally a reversible injury or damage to health<br>▪ Infrequent environmental nuisance to the affected community. Reduction of the abundance/biomass of flora & fauna in the affected environmental setting<br>▪ No changes to biodiversity or the exposed ecological system<br>▪ Incidental financial losses to commercial resources | ▪ Medical treatment required high financial loss<br>▪ Injury or damage to health that may require ongoing medical treatment<br>▪ Ongoing, sustained environmental nuisance to the affected community. Reduction of abundance/biomass in the affected environmental setting. Limited impact to local biodiversity without a significant loss of pre-impact ecological functioning<br>▪ Temporary financial loss involving a portion of a commercial resource operation (e.g. a set-back of days to weeks, with a rapid return to pre-exposure profitability) | ▪ Extensive injuries, loss of production capability, major financial loss<br>▪ Normally a Lost Time Injury or damage to health, which may require prolonged medical treatment and rehabilitation. This injury may have resulted in a permanent disability<br>▪ Substantial reduction of abundance/biomass in the affected environmental setting. Significant impact to biodiversity and ecological functioning. Eventual recovery of ecological systems possible, but not necessarily to the same pre-impact conditions<br>▪ Significant financial loss to a business unit of a commercial resource operation (e.g. a set-back of months, with long term loss of profitability) | ▪ Death, huge financial loss<br>▪ Injuries or health effects resulting in death or severe permanent disability to one or more persons<br>▪ Irreversible & irrecoverable changes to abundance/biomass in the affected environmental setting. Loss of biodiversity on a regional scale. Loss of ecological functioning with little prospect of recovery to pre-spill conditions<br>▪ Complete and irreversible loss of a commercial resource operation |