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Arm End Public Recreation Reserve

Environmental Management Plan

May 2022

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Glossary of Terms

BA	**Building Application**
BPEM	**Best Practice Environmental Management**
CCC	**Clarence City Council**
DA	**Development Application**
DPIPWE	**Department of Primary Industries, Parks, Water and Environment**
EMP	**Environmental Management Plan**
EMPCA	**Environmental Management Pollution Control Act**
EPA	**Environmental Protection Authority (Tasmania)**
KC	**Kingborough Council**
LUPAA	**Land Use Planning and Approvals Act**
MAST	**Marine and Safety Tasmania**
NATA	**National Association of Testing Authorities**
NHRT	**National Handfish Recovery Team**
PWS	**Parks and Wildlife Service (Tasmania)**
WHS Act	**Work Health & Safety Act**

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Arm End Public Recreation Reserve

Operating under the controlling management of;

Mary Ann's Island Pty Ltd

ACN 141 272 568

C/o Groom Kennedy
Level 1, 47 Sandy Bay Road
Hobart, Tasmania, 7000 Australia

Contact;

Craig Ferguson – Project Director

M. OOS E. OOS

Document Status

Rev No.	Author	Status	Approved for Issue	
			Name	Date
1	OOS	Draft – For Review.	C. Ferguson	OOS
2	OOS	For Issue - After CCC & PWS comments.	C. Ferguson	OOS

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Arm End Vision Statement

Arm End is a multi-use public recreation reserve on a spectacular headland at the tip of the South Arm Peninsula in Southern Tasmania.

Our vision is to manage this spectacular place as an inclusive cultural landscape, creating an extraordinary, world-class publicly accessible multi-use recreation space for Tasmanians and visitors to experience.

We are building on the sense of place that already exists, working with the landscape to replant native vegetation and reinvigorate ecosystems. Meandering trails will make the most of this unique site, and its natural values and heritage stories will be showcased and shared with all.

A world-class public access golf course, draped naturally across the landscape, blending with other recreational activities and with spectacular views from every point, is also being built to help fund the significant rehabilitation.

Arm End will be an iconic and favourite Tasmanian destination for golfers and recreational visitors alike...and an environmental and economic legacy for the whole Tasmanian community and future generations will have been forged.

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1. Introduction and General Information

This Environmental Management Plan (EMP) has been developed to incorporate both the construction and operational phases of the Arm End Public Recreational Reserve Project (Arm End) and associated works at 150 Spit Farm Road, Opossum Bay (Arm End). The project proponent is Mary Ann's Island Pty Ltd (MAI) operating under the project name ***'Arm End'***.

The EMP addresses the following two (2) key components.

1. ***Construction Management – (Section 3)***

This component outlines the construction works that will be implemented for the project and outlines the management strategies, responsibilities, and monitoring procedures relevant to the project. Management of identified environmental aspects is described within the EMP, each providing a detailed description of the controls and actions required for management of the respective environmental aspects.

The construction works for the project are to be undertaken in work packages that will be in conjunction with one another so that they align with the site master plan and detailed golf course design. For ease of understanding and tendering of the works, six (6) construction phases have been identified (outlined below).

2. ***Operations Management (Section 4)***

This component outlines the operational works and procedures that will be implemented for the project and outlines the management strategies, responsibilities, and monitoring procedures relevant to the project. Management of identified environmental aspects is described within the EMP, each providing a detailed description of the controls and actions required for management of the respective environmental aspects.

This EMP has been compiled as required in conjunction with numerous specialists and suitably qualified professionals and consultants. The proposed construction works, and operational tasks are outlined in accordance with the approved developments and as per the Site Master Plan (Appendix B - Site Plan).

This EMP is a document designed to provide environmental management objectives, strategies and actions that will apply to on-site activities during the entire project phase (construction & operations). This EMP describes the statutory framework, objectives and policy commitments, management strategies, responsibilities and monitoring procedures relevant to this project. Management of identified environmental aspects is described within the EMP, each providing a detailed description of the controls and actions required for management of the respective environmental aspects.

This EMP is a management tool used to support the controls and mitigations for potential environmental impacts arising from the project, including the following identified environmental aspects:

- Stakeholder Communication;
- Construction Management;
- Operational Management;
- Design & Construction
- Natural Values;
- Cultural Heritage (Aboriginal & European);

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- Erosion and Sediment Control;
- Hazardous Materials;
- Waste Management;
- Noise Emissions;
- Air Quality; and
- Traffic Management.

The Arm End team objectives are to ensure that environmental management will be appropriately planned, implemented and maintained, following the principles of Best Practice Environmental Management (BPEM) to drive compliance (legislative, approval conditions & crown lease) and efficient record keeping throughout all stages of the Project.

The key objectives of the Project are as follows;

- To define the processes for ensuring that the environmental requirements of the project are implemented to the satisfaction of the regulatory authorities including, Local, State and Commonwealth Governments;
- To define the processes for monitoring and reporting conformance with the project environmental requirements;
- To establish processes for assessing effectiveness of environmental controls and providing for continual improvement in environmental performance as the contract works progress;
- Ensure all works are completed to current accepted standards and practices in respect of design, construction, maintenance and safety so that the security of the development is assured during the works and in the future;
- In carrying out the works achieve a safety standard for those involved in the works, the ongoing operation and maintenance of the development that is equal to today's best practice;
- Community – reduce and avoid any nuisance to the local community as a result of the works; and
- Comply with the relevant conditions outlined in the following approvals;
- Planning Permit (D-2015/235) Golf Course - Clarence City Council;
- Reserve Activity Assessment (RAA- Arm End Multi-Purpose Public Recreation & Golf Links Proposal Gellibrand NRA) - Tasmania Parks & Wildlife Service;
- Aboriginal Permit No. 71 – Arm End Public Recreational Reserve;
- The EMP encompasses both the construction phase of the project and the operations of the Arm End development.

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Construction Works Summary

Listed below is a summary of the six (6) construction phases for the Arm End Project

Full details of each phase are outlined in Section 3 of this document.

Phase 1 – Weed Management, Rehabilitation and Revegetation

The weed management works have commenced on site. Progress against the targets outlined in the approved Weed Management and Revegetation Plan (Appendix C) have been achieved, especially in terms of managing African Boxthorn and Serrated Tussock.

Extensive rehabilitation and revegetation works will be completed after the earthworks for the golf course have been achieved and the irrigation system installed, so as not to interfere with these specialised works. All rehabilitation works will be undertaken in accordance with the approved Weed Management and Revegetation Plan.

A Landscape Management Plan (Appendix D) has been completed for Arm End. The plan provides a master plan for the site planting schedule requirements, while also providing detail for the screening planting for the maintenance facility and car park. Most landscaping works will also commence when the irrigation network is installed.

Phase 2 - Site Access and Car Park – (including civil works, water storage tanks, access roads, shared pedestrian and cycling pathway network)

- ***Site Access & Car Park*** - Provide 6m wide access road, car park and maintenance facility in accordance with approved 'as constructed' civil design drawings.
- ***Water Storage Tanks*** – Installation of 2 x 2.0ML water storage tanks. These above ground bolted steel tanks will be trucked to site in flat packs and then installed on site.
- ***Shared Pathway Network (pedestrian & cycling)*** – The shared walking and bicycle tracks will be constructed to a minimum of Class 2 Nature Trail Standard. The final micro - alignment of pathways will be undertaken with the approval of the Senior Ranger at Seven Mile Beach.
- ***Civil Work*** – Site preparation and infrastructure installation including;
  - Erection of temporary fencing for construction;
  - Implementation of erosion and sediment controls;
  - Earthworks, clearing, grubbing, and grading for new road access and car park and creation of new road for access to maintenance facility and water storage tanks;
  - Drainage excavation and shaping and trimming for surface drains, stormwater infrastructure and bio basin;
  - Supply, spread and compact subgrade materials for roads, car park and maintenance facility area;
  - Signage and line marking of road and car park area;
  - Connection of power and potable water;
  - Installation and commissioning of the water storage tanks; and
  - Install security fencing around the maintenance facility.

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Phase 3 - Irrigation Network

The works involved for the irrigation system installation at the Arm End site include the following;

- Field locate and marking of irrigation configuration and sprinkler locations/spacing by course architects and irrigation designer;
- Mole ploughing, trenching and/or placement on ground of irrigation infrastructure;
- Site inspections to assess that contractor are installing irrigation system in line with design and specifications; and
- Installation of irrigation central control system.

Phase 4 - Golf Course

Detailed design has been completed for the golf course; this design is currently being reviewed by the MAI Board. Detailed design and subsequent plans will be completed and provided to regulatory authorities prior to the golf course works commencing.

The construction works for the project are to be undertaken in work packages that will be in conjunction with one another so that they align with the site master plan and detailed golf course design. For ease of understanding and tendering of the works, the following six (6) construction phases have been identified.

The golf course is one element of the entire project, consequently the construction works for the project are to be undertaken in work packages that will be in conjunction with one another so that they align with the site master plan and detailed golf course design. The more detailed works for the golf course (final shaping, soil conditioning and turf installation etc). will not commence immediately, however other phases of works will be undertaken prior to the golf course being finalised.

The works involved for the golf course include the following elements;

- Mobilize plant and equipment to site;
- Set out & survey;
- Test growing areas for identified turf species;
- Clearing and grubbing, earthwork, drainage;
- Shaping of golf course – bulk formation of holes;
- Bunkers, fairways, rough development and greens, tees – complexes;
- Final Shaping - micro fine detail shaping;
- Soil conditioning; and
- Installation of turf - undertaken via hydro mulching; and

Phase 5 - Construction of a Café/Pro-shop and Maintenance Facility

The works involved for the café/pro-shop and maintenance facility include the following;

- Construction of a Café/Pro-shop for use by the public visiting Arm End;

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- Provide a location that enables golfers/general public to access information on the use and management of the site;
- Build a maintenance facility to store and house plant and equipment for the maintenance of the site; and
- Provide adequate office space and amenities for employees of Arm End.

Phase 6 - Installation of interpretation signage and formalisation of public recreation areas

The installation and formalisation of the interpretation signage and public recreation areas will be undertaken sequentially in designated packages of works, as the construction works progress to the site's official opening.

Works have included completing the following:

Signage Plan

A Signage Plan has been completed (Appendix E). The document provides an outline of the proposed approach to a signage plan for the Arm End Public Recreation Reserve.

Public Recreation Areas

The construction works for the public recreation areas are to be undertaken in sequential packages of works.

The duration of the construction works is expected to be two (2) years, with the project expected to be completed and operational by summer 2023. The anticipated timelines for each phase are as follows;

- **PHASE 1 -** on-going during the construction and operational works;
- **PHASE 2** - 16 weeks;
- **PHASE 3** - 16 to 20 weeks;
- **PHASE 4** - 48 to 56 weeks;
- **PHASE 5** - 8 weeks;
- **PHASE 6** - 4 weeks

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Operational Management Summary

The operation of Arm End includes the management and maintenance of the Public Recreation Reserve, which includes a public golf course.

Site management will be proactive and responsive through undertaking a range of operational activities that will ensure effective environmental management of Arm End. This will be achieved by implementing a management strategy that recognises the significance of the natural and cultural values of the reserve, while needing to balance their management with the use and development for recreation and visitor infrastructure, to achieve a sustainable outcome.

The following management systems will be implemented:

Environmental Management

- Education and Training; and
- Public Access.

Natural Values Management

- Biodiversity;
- Weed Management and Revegetation;
- Avi-Fauna - including establishing a Bird Sanctuary;
- Cultural Values (Aboriginal & European);
- Water (surface and groundwater);
- Geoconservation; and
- Soil (acid sulfate soil, monitoring and erosion management).

Shared Pathway Network

An enhanced trail network will be one of the most significant assets within the Arm End Public Recreation Reserve.

Emergency, Evacuation & Bushfire Management

- Emergency Response Plan (Appendix F);
- Bushfire Hazard Management Plan (Appendix G).; and
- Bushfire Emergency Plan (Appendix H).

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Communication

Arm End has developed a Communications Plan (Appendix I). to define the projects vision and objectives, while identifying key community and land management stakeholders and to detail processes for effective communication.

Safety and Risk

Arm End Management has many legislative, moral obligations and responsibilities to provide both a safe working environment for all employees and subcontractors, as well as an obligation to protect the environment.

- Workplace Health & Safety Policy Manual (Appendix J);
- Risk Management Plan; (Appendix T);
- Golf Risk Management; and
- Spraying of Chemicals Policy.

Signage Plan

A Signage Plan has been completed (Appendix E). The document provides an outline of the proposed approach to a signage plan for the Arm End Public Recreation Reserve.

Irrigation Management

Arm End was originally proposing to use Class B recycled water at the Arm End site. It has now been determined by the Arm End Board that the benefits of shared recycled water will be far greater if quality is improved to Class A recycled water. Accordingly, the Arm End site intends to use Class A recycled water.

The assessment to use Class A recycled water is currently with the Environment Protection Authority (EPA) Tasmania. The EPA advised, as part of the assessment that a recycled water quality management plan (RWQMP) would be required for the ongoing management strategy for recycled water treatment, monitoring and supply.

- Design
- Advanced technologies.
- Buffer zones;
- Monitoring; and
- Reporting.

Dog Management

- Consideration of others;
- Declared areas;
- Exercise areas;

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- Restricted area; and
- Prohibited areas.

Machinery Management

- Machinery use;
- Equipment repair and maintenance;
- Maintenance records;
- Equipment safety;
- Education and training; and
- Maintenance facility.

1.1 Site Location

The Arm End site is located in the suburb of Opossum Bay, approximately 45km southeast of Hobart. The site is a 116ha multi-use public recreational reserve on a spectacular headland at the tip of the South Arm Peninsula. The area is bordered by the Derwent River to the West and Ralphs Bay to the East and features dramatic views with rugged coastal cliffs, interspersed with beautiful beaches and secluded bays.

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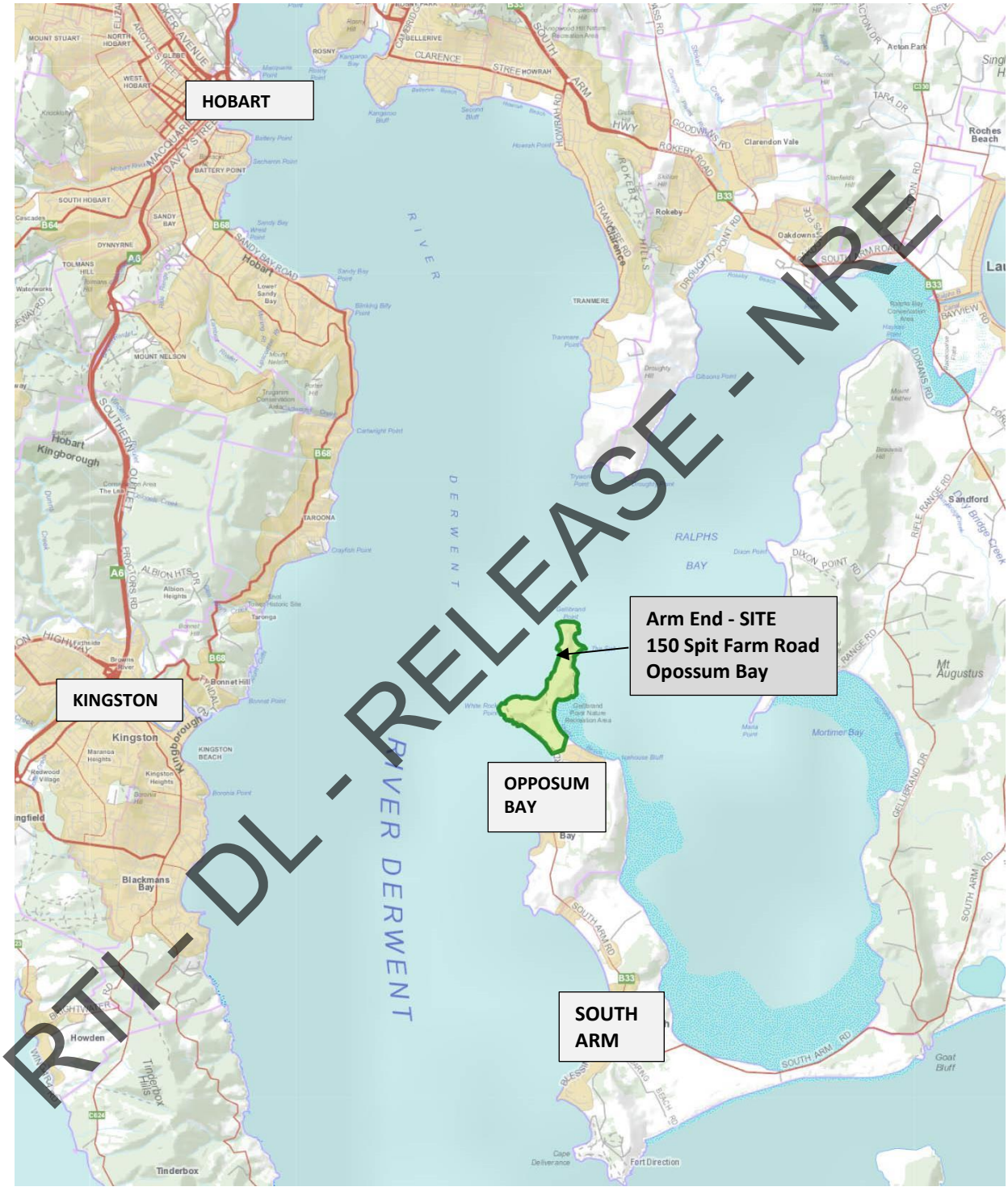
Figure 1 Aerial Location Plan of Arm End Site



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Arm End

Figure 2 Approved Arm End Layout

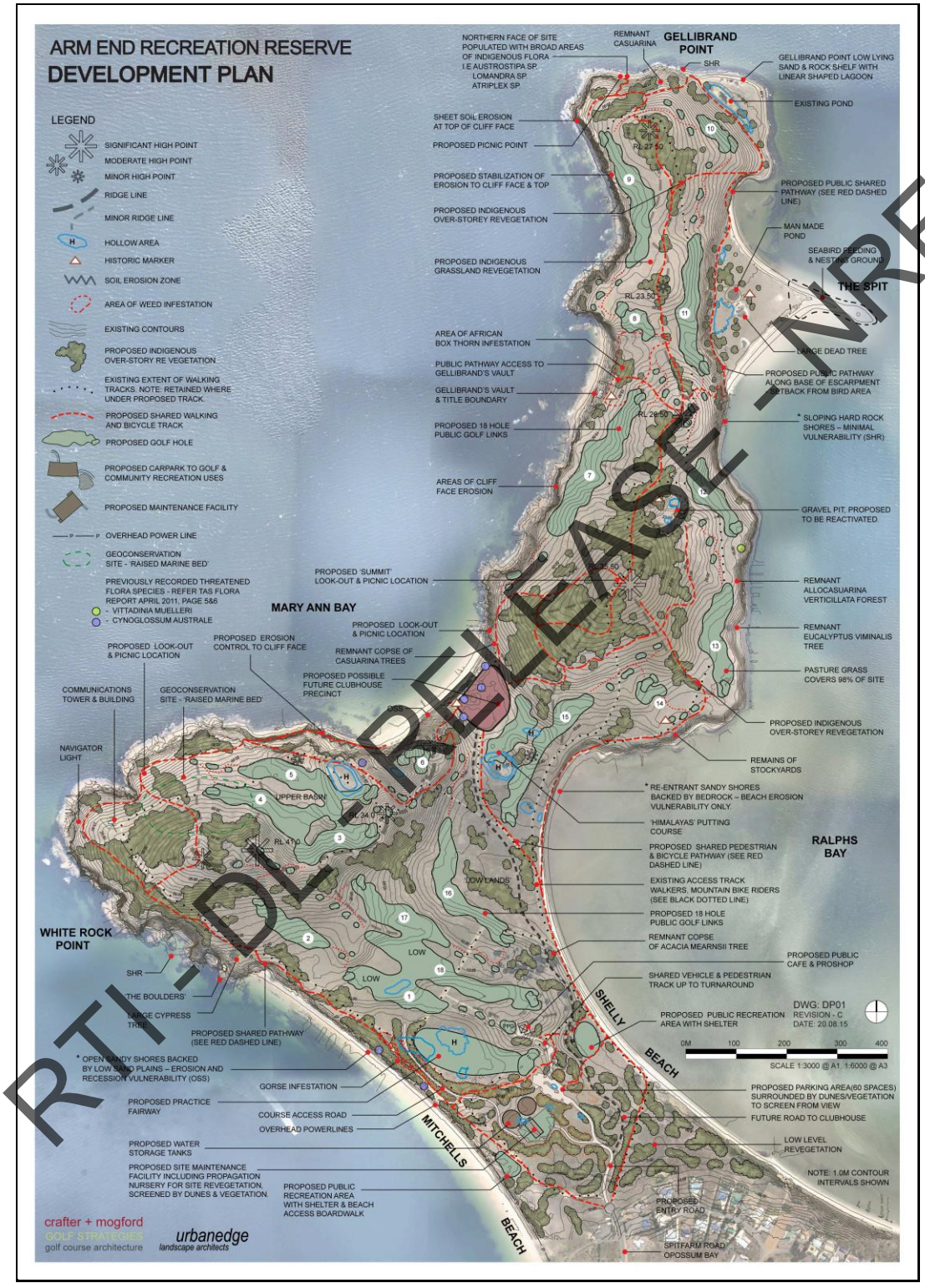

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Figure 3 Aerial of Main Irrigation Network at Arm End

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1.2 The Proponent – Mary Ann's Island Pty Ltd

Mary Ann's Island Pty Ltd (MAI) operating under the project name ***'Arm End'*** is the proponent for this activity.

The Proponent:	**The proponent representative:**
Mary Ann's Island Pty Ltd 1/47 Sandy Bay Road, Hobart TAS 7000 ACN 638678798 Chairman: OOS [redacted] OOS [redacted]	Craig Ferguson: Project Director OOS [redacted] OOS [redacted]

1.3 The Project Engineer Representative

An appropriately competent engineering consultant will be engaged to provide engineering design for the Arm End development infrastructure including:

- Engineering assessment and reviews for design and construction; and
- Certification of the works during construction.

1.4 Project Background and Overview

The Arm End proposal is for a high-quality recreational facility, featuring a network of public walkways, cycling tracks, viewing lookouts and interpretation trails, all commercially underwritten by a public golf course created and operated by Arm End under a lease agreement with the Crown (Tasmania Government). The lease and other regulatory conditions will ensure that the conservation & recreation management objectives for the site are delivered.

The proponent Mary Ann's Island (MAI) P/L has a board of directors that regulate and administer the operation under the project name ***'Arm End'***. MAI was formed exclusively to facilitate the opportunity to develop the Arm End site. The company directors are all proud and passionate Tasmanians who are excited about the opportunity to create a world class mixed use recreational facility.

To address the degradation of the property's natural values and to encourage increased visitation through the development of multi-use public recreation space and opportunities, a world-class links golf course is central to the improvement of the Arm end site, as it substantiates the private investment required to transform and regenerate the property, when the public purse cannot afford to do so.

Arm End was historically managed as an agricultural property, which has become significantly degraded over the last fifteen (15) years. This proposal will see the rehabilitation of the property, through removal and management of several infestations of invasive weeds and feral pests, which are limiting native biodiversity and contributing to coastal erosion and visitor risks, including rabbit burrows, degraded walking tracks and a growing fire hazard. The Arm End project intends on revegetating approximately 50% of the property back into native heathland, grassland and woodland. The beneficial impact of these works will be a more vibrant ecological network, that will be reminiscent of the biodiversity that existed on the property before European settlement.

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1.5 Arm End History

Prior to European settlement, the Opossum Bay region was inhabited by a band of Aborigines that were part of the Oyster Bay tribe. Living near the coast, they ate what they could catch. Native animals, sea birds and their eggs and bountiful shellfish were easily accessible. There are Aboriginal sites recorded in the area.

In 1824 William Gellibrand and his son Joseph arrived in Van Diemen's Land. William was a well-connected settler and was granted 2000 acres of land at South Arm and assigned ten convicts. Over the years many convicts, men and women, served under him. He was known for the care he showed them, providing them with a comfortable hut and clothing that did not distinguish them as prisoners. William helped some convicts to establish a fresh start giving them the opportunity to raise families and contribute to founding the community of South Arm.

Shortly after his arrival William built a homemade of cedar with sandstone brick foundations on Arm End. William also built his own tomb. Miss Jane Mortimer, a regular visitor to the homestead, mentioned that every morning after breakfast William went to dig the vault located just below the house at the top of the dunes beneath, she oak trees, overlooking Mary Ann Bay. He liked to spend sunny afternoons sitting on it reading. He must have had a strong sense of attachment to this place.

William Gellibrand was a significant figure in colonial society. He was a merchant and exporter and served as a Justice of Peace. William and his descendants were active in Tasmanian social and government circles. Joseph Gellibrand became Tasmania's first Attorney General. Three of Joseph's sons became politicians. William died in 1840 aged 75 and was buried at the Vault. Two of his grandsons are also buried in the vault.

Arm End then passed to his grandson George Gellibrand who, after leasing out some of the land, placed it on the market in 1844. He described it as being studded with the tallest trees in the colony and having the very best winery on the island, covering two acres of fertile ground with full bearing fruit.

Christopher Calvert jnr. leased that part of the land now known as Arm End and lived in the house until he retired in 1914. The homestead quickly fell into disrepair, was vandalised and eventually burned down.

In 1940 George Richardson bought Arm End and in 1949 it was purchased by the Calvert family.

In 1995 it was acquired by the state, on behalf of the people of Tasmania and in 2011 the area was declared a nature recreation area and named Gellibrand Point Nature Recreation Area.

1.6 Arm End Strategy

The proposal is for a high-quality recreational facility, featuring a series of public walkways, cycling tracks, and an interpretation trail. All facilities will be commercially underwritten by a public golf course, created, and operated by the proponent under a lease agreement with the Crown (Tasmania Government).

The project has been developed on the basis of the following packages of improvement and construction works on the site. The following proposed work packages will be implemented in conjunction with one another so that they align with the site master plan and detailed golf course design:

- 18-hole public links Golf course;
- Walking and cycle paths;
- Car parking;
- Maintenance facility;

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- Visitor café/pro-shop;
- Protection of known remnant values; and
- Revegetation of disturbed and degraded areas of the reserve.

The development will specifically address a key reserve management objective. This being;

'*To protect the nature recreation area against, and rehabilitate the nature recreation area following, adverse impacts such as those of fire, introduced species, diseases and soil erosion on the nature recreation area's natural and cultural values and on assets within and adjacent to the nature recreation area.*'

The threats identified are addressed within this EMP, with detailed management strategies and controls to ensure the project objectives are enhanced and the conservation & recreation values of Arm End are achieved by implementing the following;

- rehabilitating the natural environment;
- ongoing site management & monitoring;
- increased recreation appeal - both volume and variety (walking tracks upgrade, interpretation stations, golf etc.);
- Creating jobs onsite and enhanced benefits to business in the area through increased visitation and enjoyment of the site and reginal area; and
- Preserving site cultural heritage values.

1.7 Land Managers

In accordance with the National Parks and Reserves Management Act 2002, MAI have a commitment to be a responsible and effective land manager. Using the framework outlined in the Tasmanian Reserve Management Code of Practice 2003 (the Code), MAI will strive to comply and improve compliance through broadly implementing the Code.

Through a lease agreement with the Tasmania Government (Property Services -PWS) MAI have the responsibility to manage the land known as the Gellibrand Point Nature Recreation Area. This land, under the project name Arm End is also known as the Arm End Public Recreation Reserve.

The primary objective of the Arm End Public Recreation Reserve land managers is the conservation of natural and cultural values, this will be achieved by using the framework outlined in the Code which provides best practice operational standards to guide activities on site.

Approval conditions outlined in the Reserve Activity Assessment (RAA) provide a robust management tool to achieve the objectives of the Code for the Arm End Public Recreation Reserve and its values.

All statutory requirements will be met and implemented by the land managers.

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1.8 Arm End Benefits

1.8.1 Environmental

This Arm End project will see the rehabilitation of the property, through removal and control of invasive weeds and feral pests, which are limiting native biodiversity, and contributing to coastal erosion and visitor risks such as rabbit holes, degraded walking tracks and a growing fire hazard. Arm End intends to build on the remnant natural values of the area including revegetating the property back into native heathland, grassland, and woodland. The impact of all this will be a much more vibrant ecological network that will be reminiscent of the biodiversity that existed on the property before European settlement.

1.8.2 Cultural & Social

The property has rich Aboriginal and European Heritage, which will be managed, interpreted and celebrated. The project will work and develop the site with respect of all past present and future stakeholders.

The variety of recreational opportunities for the local community as well as visitors will promote local health and well-being through walking, cycling, golf, economic & employment opportunities, education and co-ordinated volunteering in the great outdoors.

Arm End acknowledges the Tasmanian Aboriginal community as the traditional owners and custodians of lutruwita (Tasmania), its land, waters and seas. We pay respect to Elders past, present and emerging.

1.8.3 Economic

Construction jobs, operational employment, and indirect jobs will increase the overall revenue to the local economy through increased investment, visitation and spending in the area.

There will also be increased income to PWS from the annual lease payment, savings from the delegation of management, and through private investment in public infrastructure & the environment.

1.9 Existing Site Leases and Freehold Titles

There are two (2) identified existing leases and/or freehold land parcels in the Gellibrand Point Nature Recreation Area (Arm End), these are;

- The Gellibrand Vault Site (Freehold); and
- The Broadcast Australia Transmission site located on the White Rocks point area. (Lease).

Both stakeholders have been contacted and support the development. All development activities that occur close to or in any way impact on or encroaches upon these sites will be communicated to and managed with the full consent of the lessee or freehold title owners.

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2. Planning and Approvals

The planning for the Arm End development has been ongoing for the last decade with targeted site investigations, assessments and reviews.

The project approvals have been issued by the following regulatory authorities;

- Planning Permit (D-2015/235) - Clarence City Council;
- Reserve Activity Assessment (RAA) –Tasmania Parks & Wildlife Service;
- Aboriginal Heritage Permit No. P71; and
- Crown Lease – Tasmania Government.

The approval is subject to a variety of permit and approval conditions including (but not limited to):

- Pre-commencement requirements;
- Construction controls and requirements;
- Operational management; and
- Environmental and heritage controls and requirements.

This EMP provides the environmental management objectives, strategies and actions to capture the conditions applicable to the development works, and how management controls will be applied to on-site construction and operational activities for the project.

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3. Construction Environmental Management

The design and construction of each built element will be in accordance with relevant Australian Standards, codes of practice and water industry standards.

The construction works for the project are to be undertaken in work packages that will be in conjunction with one another so that they align with the site master plan and detailed golf course design.

For ease of understanding and tendering of the works, the following six (6) construction phases have been identified.

3.1 Phase 1 - Weed Management, Revegetation & Rehabilitation

The works involved for the weed management, revegetation and rehabilitation for the Arm End site include the following;

- Improve the condition of the site, by promoting the establishment of native vegetation species and fauna habitat;
- Broad scale control of significant weed species, targeting high priority weed management actions;
- Large-scale revegetation to improve the amenity of the site, provide additional habitat for native fauna and initiate screening and landscaping for the public access tracks and golf course;
- Monitoring and maintenance of controlled sites and supervising the potential emergence of other weed species;
- Rehabilitation of areas of coastal erosion, by stabilizing through active revegetation and laying of jute matting.

3.1.1 Design & Investigations

Preparatory works for the project have included several stages of design, site, and environmental assessments, including the following:

Botanical Values Assessment

An assessment of the botanical values at Arm End was completed in May 2016. The report was completed to provide a baseline assessment of the native and exotic flora species present at the Arm End site. The information from this report was used to develop a Weed Management and Revegetation Plan for the site.

Refer to Appendix K for a copy of the Botanical Assessment Report.

Weed Management and Revegetation Plan

As part of ongoing weed control works at the Arm End site, targeted high priority weed management actions have been undertaken during the recent period; including an extensive works program to achieve primary control of African boxthorn and a broad spraying program that targeted a wide range of weed species.

The weed management section of the plan outlines the existing extent of weed across the site and outlines management controls to treat weed species, with the aim of eradiating weeds front site.

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The revegetation plan provides methodology for revegetating the site, including site preparation, planting lists, propagation details and maintenance plans. The rehabilitation of eroded aeras and zones of dense weed infestations are also outlined in the plan.

A detailed outline of the works that are to be implemented are outlined in the Weed Management and Revegetation Plan (Appendix C).

Landscape Management Plan

A Landscape Management Plan has been completed for Arm End. The plan provides a master plan for the site planting schedule requirements, while also providing detail for the screening planting for the maintenance facility and car park (Appendix D).

3.1.2 Works Methodology - Weed Management

Due to the widespread nature of weed infestations at the site and the variety of weed species present, techniques implemented to manage and control weeds will be varied and an adaptable approach will be applied including;

- Foliage spraying using herbicide to kill weed species, either by boom spraying, spot spraying, or cut and paste (paint) method;
- Hand pulling, typically used for seedlings and small plants that re easily pulled out;
- Physical removal which involves grubbing plants out by chipping with a mattock or hoe for smaller plants, like grasses, or thistle; and
- For large infestations use of mulching heads, mounted on an excavator and a skid-steer to mulch down whole boxthorn plants in-situ. The excavator primary role is to mulch scattered large boxthorn plants, whereas the skid steer is used to mulch less vigorous extensive areas.

3.1.3 Works Methodology - Revegetation and Rehabilitation

The revegetation and rehabilitation of the Arm End site will involve the following works;

- Site preparation, including slashing of long grass, weed control, ground preparation for planting;
- Ground works for large revegetation areas will require breaking up the ground following weed control works. This may involve some mound ploughing and ripping the ground (where appropriate). Weed control will be implemented after ground works;
- Erosional zones will require the laying of erosion matting (i.e., Jute matting) and active revegetation;
- Species selection will come from local provenance native species and will need to be well-established and hardened off prior to planting. Seed should be collected either from the site of within the South Arm region, so plants are genetically suited to the area and have an improved chance of survival;
- Planting should be completed (where practical) at the site during late autumn and into winter to maximize survival rates. Plants can either be planted into rip lines or mounds or holed dug for each plant. All new trees will require watering post planting to enhance survival and growth rates;
- Plant protection will be required until new plants become established. Plant protection will be achieved through fencing or tree guards and socks or a combination of all.

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Progress to date:

Since the Crown lease was signed in 2014 Arm End has invested over $50k in weed management and revegetation works. Upon assuming site management from Crown / PWS the site was infested with two established declared weeds;

- African boxthorn; and
- Serrated tussock

Full progress updates available on request.

3.2 Phase 2 - Site Access & Civil Works

The works involved for the site access, car parking, water storage tanks, shared pathways and associated civil works are an important initial works phase for the project. Detailed engineering design has been completed, the areas of works are outlined and in the construction drawings (refer to Appendix N). The works will be completed in accordance with the following design elements;

- General arrangement plans;
- Existing conditions (cultural heritage sites);
- Erosion and sediment control;
- Road alignment;
- Typical sections and details;
- Bulk earthwork requirements;
- Pavement and sealing plan; and
- Signage and line marking.

Preparatory works for the Phase 2 works have included several stages of design, site, and environmental/cultural assessments, including the following:

3.2.1 Design & Investigations

Preparatory works for the site access and associated civil works have included several stages of design, site, and environmental/cultural assessments, including the following:

Detailed Design

Detailed design of the Phase 2 works, with accompanying construction drawings has been completed. The design has been achieved working closely with other expertise and contractors to meet the specification and suit the construction methodology. The detailed design has been achieved after receiving input from the following design items.

Civil Design

Civil design has been undertaken for the proposed site access, car parking and maintenance facility. Erosion and sediment control plan has been included in the civil design. The design has produced final construction drawings and documentation for a contractor to build the Phase 2 works. The design includes; roadworks, drainage, cross sections, road longitudinal sections, pavement/seal plan and sign and line marking requirements.

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Survey

A detailed survey has been undertaken for the land-based HDD works. The works have included identifying underground services, highlighting topographic features, UAV imagery and development of a terrain model for the pipeline alignment. The captured profiles have been used to complete the civil design, road access alignments and car parking and maintenance facility profiles.

Aboriginal Heritage

A detailed aboriginal heritage survey (2 phases) has been completed for the Arm End Public Reserve site. The report highlighted manage controls that would be required for the works. A subsequent aboriginal permit – P71 has been issued by the Minister (Appendix L). All works will be completed in accordance with P71 and have been included in this EMP. All identified cultural heritage sites outlined in P71 have been included, via GIS mapping in the design of the site, including the golf course component. All cultural heritage sites outlined in P71 will be demarcated and adequately fenced for the construction works.

If during the process of undertaking the proposed works, suspected Aboriginal sites or skeletal remains are encounter, then the Unanticipated Discovery Plan (refer to Section 7.6) will be implemented.

After discussions and review of this EMP_V1, with PWS and AHT a subsequent Aboriginal Cultural Heritage Assessment has been completed for the site access road, car park and maintenance area.

This report is provided in Appendix W.

Botanical Values Assessment

An assessment of the botanical values at Arm End was completed in May 2016. The report was completed to provide a baseline assessment of the native and exotic flora species present at the Arm End site. The information from this report was used to develop a Weed Management and Revegetation Plan for the site.

Raptor Nest Assessment

An assessment of potential raptor nest at the Arm End site has been completed. The investigation targeted the status of two (2) raptor records on the end of the South Arm Peninsula. The information from the assessment established that there is no evidence of either of the nests.

Refer to Appendix M for a copy of the Raptor Nest Assessment

3.2.2 Construction Methodology

The Phase 2 construction program will be coordinated into three (3) key construction stages, and will include the following;

Access Road & Car Parking

The access road will be designed to meet the Local Government Association Tasmania (LGAT) – Tasmania Municipal Standards for roads.

The access road will be constructed undertaking the following works;

- Earthworks
    - Implementation of erosion and sediment control plan;

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  - clearing and grubbing of topsoil for the road alignment, car park, water tanks and maintenance areas; and
  - excavation to strip 100/150mm of topsoil.
- Drainage - detention basin, drainage pipes, culverts and end walls, swale drains.
- Pavement - supply, spread and compact sub-base and base material, including final trim. Traffic island, footpaths and curbing.
- Bituminous Surfacing - prime and two coat sprayed seal.
- Traffic Facilities – line marking, direction arrows, wheel stops, kept left signage, give way signs and disabled parking signage.
- Environmental and traffic management.

Refer to Appendix N for a copy of the design drawings for the Car Parking & Access Road.

Water Storage Tanks

The water storage tanks for the use of recycled water on the site will be prefabricated units and will be installed in accordance with applicable Australian Standards and Building Codes.

The initial footprint and access road to the water storage tanks and maintenance facility will be cut and filled to meet the design levels, the footprint will consist of the design specified pavement material.

These features are components of the development of a multi-use public recreation reserve across the project Area but themselves are restricted to a small area immediately to the north of the cul de sac at the termination of Spitfarm Road.

In earlier design phases the water tanks were to be placed above the existing ground surface but it has become necessary, due to engineering constraints and safety of the structures, to excavate a shallow layer of the ground surface beneath the pads supporting these tanks.

As a result of this, Aboriginal Heritage Tasmania (AHT) and the Tasmanian Parks and Wildlife Service (PWS) required the project to provide specialist Aboriginal heritage management advice containing a rationale for the departure from Condition 21 of the Reserve Activity Assessment (RAA3297), which specifies that the excavation of the ground surface at the site of the water tanks is to be avoided.

Shared Pathway Network - Pedestrian and Cycling

The alignment of the shared pedestrian and cycling pathways have been managed in accordance with the detail design for the golf course. The civil design of the pathways has been undertaken in accordance with standards of a Class 2 Nature Trail (Australian Standards – AS 2156.1-2001).

Refer to Appendix N for a copy of the design drawings for the shared pathways.

The final micro- siting of the pathways will include site inspections, collaboration with and approval from the Senior Ranger at Seven Mile Beach.

Plant and Equipment

The typical plant and equipment used for the civil works is as follows;

- Utility Vehicles;

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- Excavator;
- Mini Excavator;
- Scraper;
- Backhoe;
- Roller;
- Grader;
- Trucks;
- Skid Steer;
- Water tank;
- Temporary site office/amenities; and
- Utility service locator.

Site Setup

The contractor will set up the work site which at a minimum will cover the following key aspects;

- Site works fencing and signage;
- Entry and exit points;
- Pedestrian access and appropriate exclusion zones around moving equipment;
- Designated plant and equipment zones; and
- Traffic management systems.

Hygiene Protocols for all Construction Activities to manage weed and disease control, must include a dedicated hygiene and washdown point or station. This control item must be established prior to works commencing (refer to Section 7.2).

Site Induction

All personnel working on site will complete a pre-commencement site induction. The induction will cover off on the following items,

- Implementation of construction requirements of the EMP;
- Location of all site facilities;
- Understanding of evacuation procedure and muster points;
- PPE designated zones;
- Use of different UHF channels in different construction zones;
- Understanding of all site restrictions especially around specific requirements of the different work and access zones. The key focus will be stakeholder communication and the requirements of safe access for the public;
- Traffic Management zoning for Arm End;

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- Key personnel contact information;
- Signing on to all SWMS for the project;
- Description of the scope of works for the project;
- Requirements of daily sign on and off;
- designated site parking areas; and
- All site-specific details.

To manage natural values, landscaping and rehabilitation of the site, specific management zones for the construction works will be established by the contractor. All construction works will be undertaken in accordance with this EMP.

Off – site Fabrication

The design for the infrastructure works will incorporate, where appropriate, major off-site construction and prefabrication to limit the onsite works and construction impacts on the outlined work areas.

This work will include (but not limited to):

- Pre-fabrication of water tanks and maintenance shed components;
- Maintenance facility security fencing and entry/exit points and associated equipment;
- Water pump shed and insulation;
- Off-site fabrication of water storage tanks for installation during construction; and
- Off-site fabrication of other elements such as fencing, pipes, steelwork and timber.

On – site Fabrication

The on-site fabrication will include:

- In-situ concrete pouring;
- Steel reinforcing, formwork and falsework; and
- Minor welding.

Hygiene Protocols for all Construction Activities to manage weed and disease control, must include a dedicated hygiene and washdown point or station. This control item must be established prior to works commencing (refer to Section 7.2).

3.3 Phase 3 - Irrigation Network

The works involved for the irrigation system installation at the Arm End site include the following;

- Field locate and marking of irrigation configuration and sprinkler locations/spacing by course architects and irrigation designer;
- Mole ploughing, trenching and/or placement on ground of irrigation infrastructure;
- Site inspections to assess contractors are installing irrigation system in line with design and specifications;
- Installation of irrigation central control system; and

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- Provide adequate and compliant signage.

Refer to Appendix S for Site Irrigation Design.

3.3.1 Design & Investigations

The fully automated irrigation system has been designed to manage the irrigation requirements for Arm End, in particular the Golf course. The site will use a quality Rain Bird irrigation system with integrated control technology, that exceeds industry standards for reliability, safety, and performance.

The design of the irrigation systems has considered the surveyed cultural heritage sites. The design has been engineered so that minimal impact installation methods will be typically used. These techniques are laying pipe on the ground outside of heritage sites, using mole ploughing, HDD, as a low impact installation method. Minor trenching will be required in certain zones.

Preparatory works for the project have included several stages of design, site, and environmental assessments, including the following:

IEMP

An Irrigation Environmental Management Plan (IEMP) has been developed for the use of Class A recycled water (2021). The IEMP has been developed specifically for the Arm End site and golf course and describes how and where recycled water will be used. The plan has been developed in accordance with the Australian Guidelines for Water Recycling: Managing Health and Environmental Risks, Phase 1 (2006) (AGWR) and Environmental Guidelines for the Use of Recycled Water in Tasmania (DPIWE, 2002), and describes the measures to be implemented to protect public health and manage environmental sustainability. This document will be used as the basis for ongoing environmental monitoring (related to recycled water) and future auditing of recycled water activities on the site.

Refer to Appendix O for a copy of IEMP.

Environmental Monitoring Plan

An Environmental Monitoring Plan (EMP) for the Arm End site has been completed, in consultation with the National Handfish Recovery Team (NHRT), CSIRO and in conjunction with experts in marine ecology.

The intent of the EMP is to undertake the following;

- Undertake groundwater and surface water sampling for the pre-construction period to understand current baseline conditions;
- Undertake groundwater and surface water sampling for the golf course construction; and
- Undertake groundwater and surface water sampling for the operational use of the recycled water at Arm End.

The objective of the EMP is to meet our regulatory conditions, contribute to handfish research and be active stewards for the environment.

Refer to Appendix P for a copy of the EMP.

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Cultural Heritage

A detailed aboriginal heritage survey has been completed for the pipeline alignment. The report highlighted manage controls that would be required for the works. A subsequent aboriginal permit – P71 has been issued by the Minister. All works will be completed in accordance with P71 and have been included in this EMP. All identified cultural heritage site outlined in P71 have been included, via GIS mapping in the design of the site, including the golf course component. All cultural heritage sites outlined in P71 will be demarcated and adequately fenced for the construction works.

If during the process of undertaking the proposed works, suspected Aboriginal sites or skeletal remains are encounter, then the Unanticipated Discovery Plan (refer to Section 7.6) will be implemented.

Geoconservation

The Mary Ann Bay Shelly Sands have been discussed with a representative of the Natural Values Conservation Branch of DPIPWE. Management controls have been agreed and are formalised and outlined in Section 7.5.

In summary, a meeting (9 March 29, 2021) and further email discussion has been undertaken with Jason Bradbury – Geoscientist from DPIPWE. The key items agreed are as follows;

- Mineral Resources Tasmania (MRT) has defined the extent of the Mary Ann Bay Shelly Sands adequately - no further investigations are required to be undertaken;
- Arm End plans provided and reviewed, outlined the extent of infrastructure and the works footprint in relation to the MRT mapped geo-conservations area (Condition 7 of RAA subsequently met);
- Pre-works inspection required (prior to major civil works) - to enable analysis of the geo conservation area. Inspection to be undertaken by DPIPWE representatives (includes digging test pits to allow samples to be taken and undertake further analysis - e.g., potential for dating materials;
- Pre-works inspection will help understand the nature of the landform - whether its marine or aeolian in nature - will contribute to the scientific understanding of the Mary Ann Bay Shelly Sands geo-conservation area;
- During construction – minimisation of works that change the landform of the Mary Ann Bay Shelly Sands;
- During construction - minimal ground disturbance of the Mary Ann Bay Shelly Sands (as outlined in the plans presented in the meeting - only a low percentage of the geo-conservation area to be impacted by the golf holes and development;
- It is important to maintain the existing cliff face exposure of the cross section through the Mary Ann Bay Shelly Sands. The cliff face west of the beach for about 200m should not be obscured, nor access blocked - after weed removal and revegetation has been completed.
- Opportunity for further investigations by DPIPWE, (on as required basis), for more scientific understanding of the Mary Ann Bay Shelly Sands.

Nutrient Management Strategy

A Nutrient Management Strategy (NMS) has been completed for the Arm End site to manage recycled water and nutrient inputs. The approach of the NMS is to understand the following elements:

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- Existing soils – nutrient, physical and biological properties.
- Water quality;
- Climatic conditions;
- Select appropriate turf species;
- Manage nutrient inputs;
- Manage irrigation – design and scheduling;
- Monitoring of soil moisture and water quality; and
- Product selection.

Refer to Appendix Q for a copy of the NMS.

Survey

A detailed survey has been undertaken for the entire Arm End site. The works have included identifying, cultural heritage sites, underground services, highlighting topographic features, UAV imagery and development of a terrain model for the pipeline alignment. The captured profiles have been used to complete the design alignment and profiles.

3.3.2 Construction Methodology

The works involved for the irrigation system installation at the Arm End site include the following items;

- Site location and marking of irrigation configuration and sprinkler locations/spacing by course architects and irrigation designer;
- Pipe moling and/or laying of pipe on the ground and subsequently covered with appropriate geo-fabric and then soil material, for installation of irrigation infrastructure and water transfer line;
- Site inspections to assess contractors are installing irrigation system in line with approval conditions, design, and specifications; and
- Installation of irrigation central control system, including weather station that will link to the control system to better manage irrigation use;
- Installation of a pump station, adjacent the water storage tanks, to distribute the irrigation water; and
- Provide adequate and compliant signage.

The irrigation system will be initially marked on site to confirm irrigation configuration and sprinkler locations/spacing by course architects and irrigation designer. The installation of irrigation pipe will predominantly use a methodology known for its low impact; this approach is known as mole ploughing. This trenchless technique involves a pipe-plough forcing poly pipe down into the ground. No trench is opened, but rather a small rip in the ground is formed to enable the pipe to be laid in desired alignment (refer to Photo 6). The ground is then re-colonised by surrounding grasses. Where PVC pipe is been utilised, a small slit trench will be dug with either a ditch-witch or mini excavator, and then backfilled and re-seeded. The installation of irrigation heads and control boxes requires the same treatment; digging a small hole, affixing the designed fittings, and then backfilled by hand around the head/valve box.

On competition of the site mark-up of the layout the main distribution pipe network from the water storage tanks extending out and feeding the entire site will be installed using the methodologies outlined above.

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All works will be managed and completed in accordance with the detailed irrigation drawings and associated specifications. All irrigation works on the Arm end will be undertaken in accordance with the management controls outlined in the Environmental Management Program (refer Section 7.0 for detail).

Photo 6 Typical irrigation installation using mole ploughing equipment

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Site Management

All site management obligations resulting from all heritage assessments, permit – P71 and other approvals issued to the Arm End Project as part of project works will be complied with using this EMP.

In addition, the Arm End project team will comply with the requirements of the Unanticipated Discovery Plan (outlined in Section 7.6) for any Aboriginal Heritage items encountered during works. All requirements of the Unanticipated Discovery Plan for management of new heritage discoveries will be made accessible for direct reference by site staff during all excavation works.

Hygiene Protocols for all Construction Activities to manage weed and disease control, must include a dedicated hygiene and washdown point or station. This control item must be established prior to works commencing (refer to Section 7.2).

3.4 Phase 4 - Golf Course

Detailed design has been completed for the golf course; this design is currently being reviewed by the MAI Board. Detailed design and subsequent plans will be completed and provided to regulatory authorities prior to the golf course works commencing.

The golf course is one element of the entire project, consequently the construction works for the golf course will not commence immediately, other phases of works can be undertaken prior to the golf course works commencing.

Preparatory works for the golf course design have included several stages of design, site, and environmental/cultural assessments, including the following:

3.4.1 Design & Investigations

Master Planning

The overarching master planning for the golf course has included the project development application plans. These were established after site visits and discussion with the MAI Board. The golf architects have

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developed initial conceptual hole designs based upon the routing from site investigations and which have been agreed on with the proponent, including options with alternate design strategies for each hole. Further discussions of golf hole concept options and any modifications have been captured prior to issuing of preferred options on the golf course design.

Agronomist Assessment

To facilitate the design of the golf course an agronomist was commissioned to undertake an assessment that included the following elements;

- Detailed site inspections;
- Review of layout plans;
- Field assessments of sands and laboratory analysis;
  - Required root zone depths;
  - Particle size suitability;
  - Nutritional status;
  - Bunker suitability;
- Identification of opportunities for sand access capabilities;
- Bunker sand recommendation;
- Turf variety research and recommendation;
- Water quality review;
- Water budget development;
- Design of irrigation systems and requirements;
- Report and specification compilation.

Conceptual Design

The conceptual design phase for the golf course as included the following works;

- Development of conceptual fairway, tee and green contour plans, have been provided in 3D artist impressions;
- The conceptual design was undertaken with the understanding of aboriginal heritage permit conditions and their impact upon design and construction.
- Concept formulation of public access trail locations through the property relative to the golf holes and identification of any 'at risk' sections that may require a screening solution for public safety;
- Select and design course furniture with emphasis on bespoke items which celebrate South Arms and our site's sense of place;
- Liaising with turf consultant/agronomist regarding turf selections and use of sands for construction of greens, bunkers etc.
- Conceptual design of the extent of re-vegetation areas specifically relating to aspects such as impact on golf holes, view corridors etc.; and

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- Collaborating with the irrigation designer regarding the design intent, irrigated extent and requirements.

Detailed Design

The detailed design has included the following design elements;

- Preparation of final routing plan and construction drawings in a form suitable for the construction of the golf course and associated works;
- Undertale a comprehensive risk assessment to ensure the safe operation of the golf course facility.
- Detailed formulation of public access trail locations through the property relative to the golf holes and identification of any 'at risk' sections that may require a screening solution for public safety.

The construction phase design certification will include;

- Regular visits during construction and grow-in;
- Input into construction delivery method selection and construction sequence;
- Preparation of site notes, instructions and sketches, as required, for issue to site construction team throughout the implementation process; and
- Undertale a comprehensive risk assessment to ensure the safe operation of the golf course facility.

Survey

A detailed survey has been undertaken for the entire Arm End site. The works have included identifying, cultural heritage sites, underground services, highlighting topographic features, UAV imagery and development of a terrain model for the golf course alignment. The captured profiles have been used to complete the design alignment and profiles. The surveyor also used a GPS to mark out fairways, the tees, turn points and green centres.

Aboriginal Heritage

A detailed aboriginal heritage survey has been completed for the Arm End Public Reserve site. The report highlighted manage controls that would be required for the works. A subsequent aboriginal permit – P71 has been issued by the Minister. All works will be completed in accordance with P71 and have been included in this EMP. All identified cultural heritage sites outlined in P71 have been included, via GIS mapping in the design of the site, including the golf course component. All cultural heritage sites outlined in P71 will be demarcated and adequately fenced for the construction works.

If during the process of undertaking the proposed works, suspected Aboriginal sites or skeletal remains are encounter, then the Unanticipated Discovery Plan (refer to Section 7.6) will be implemented.

Botanical Values Assessment

An assessment of the botanical values at Arm End was completed in May 2016. The report was completed to provide a baseline assessment of the native and exotic flora species present at the Arm End site. The information from this report was used to develop a Weed Management and Revegetation Plan for the site.

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Raptor Nest Assessment

An assessment of potential raptor nest at the Arm End site has been completed. The investigation targeted the status of two (2) raptor records on the end of the South Arm Peninsula. The information from the assessment established that there is no evidence of either of the nests.

Refer to Appendix M for a copy of the Raptor Nest Assessment

3.4.2 Construction Methodology

The construction of the golf course will be undertaken in a staged approach, with golf holes grouped into work phases. The bespoke style of golf course design and construction we allow the golf course to be unearthed from the existing site landform and geography.

The works involved for the golf course include the following items;

- Site location, marking and pegging out of golf course configuration and hole locations/spacing by the golf course architects;
- Stripping and stockpiling of all site topsoil for reuse on the site;
- Spraying of the extent of the area to receive turf on each hole with herbicide;
- Power hoeing of the areas to receive turf;
- Minor earth shaping activities to form tees, bunkers and greens;
- Fine shaping of fairways, tees and greens in readiness for seeding;
- Incorporation of amendments into greens surfaces before seeding;
- Hydroseeding of all turfed areas with selected turf seed;
- Grow-in of all turfed areas;
- Establishment of dune and vegetative screening;
- Installation of landscape plantings through the course, with drip irrigation system
- Grow-in of all turfed areas;
- Construction of maintenance paths;
- Installation of course signage and course furniture;
- Site inspections to assess that contractors are building the gold course in accordance with approval conditions, design, and specifications; and
- Final preparation for opening.

The golf course will be built using a contractor to undertake the operations associated with building the course in accordance with the architectural design. Initially the course design will be pegged out on site, by the golf course architects. The land survey of the course will also be uploaded into GPS, so that the contractor can accurately define the works areas, including the fairways, greens, tees and bunkers. This GPS mapping on equipment allows the contractor to precisely produce as-built representation of the design.

The golf course will initially be stripped of existing organic matter and topsoil. This material will be stockpiled on site for re-us. The shaping of the course will be undertaken using specialised shaping

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equipment, that ensures minimal impact to the existing landscape. This approach also allows for flexibility in shaping and detailing of the golf course to accommodate the existing landscape features and geography characteristics. For best results in design a collaborative approach with designers, shapers and project managers is required.

The main aim of the initial works will be to manage ground disturbance activities during construction activities to avoid environmental/heritage impacts and maximise the potential for successful land rehabilitation and revegetation following construction. Fine detailed shaping will ensure fairways, tees and greens are in readiness for seeding. hydroseeding of all turfed areas will then be undertaken to re-colonise the ground with the selected turf species.

On completion of the grow-in of the turf, works will commence to establish dune and vegetative screening and installation of landscape plantings through the course and the site. The installation of course signage and course furniture will then occur prior to final preparation for opening the golf course.

All works will be managed and completed in accordance with the detailed architectural drawings and associated specifications.

All golf course works will be undertaken in accordance with the management controls outlined in the Environmental Management Program (refer Section 7.0 for detail).

Site Management

All site management obligations resulting from all heritage assessments, permit – P71 and other approvals issued to the Arm End Project as part of project works will be complied with using this EMP.

In addition, the Arm End project team will comply with the requirements of the Unanticipated Discovery Plan (outlined in Section 7.6) for any Aboriginal Heritage items encountered during works. All requirements of the Unanticipated Discovery Plan for management of new heritage discoveries will be made accessible for direct reference by site staff during all excavation works.

Hygiene Protocols for all Construction Activities to manage weed and disease control, must include a dedicated hygiene and washdown point or station. This control item must be established prior to works commencing (refer to Section 7.2)

3.5 Phase 5 - Café/Pro-shop & Maintenance Facility

The purpose and considerations involved for the construction of café/pro-shop and maintenance facility include the following;

- Construction of a Café/Pro-shop for use by the public visiting Arm End;
- Provide a location that enables golfers/general public to access information on the use and management of the site;
- Build a modern well considered, maintenance facility to suitably store and house plant and equipment for the maintenance of the site;
- Provide adequate office space and amenities for employees of Arm End; and
- Provide adequate and compliant signage.

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3.5.1 Design & Investigations

Maintenance Facility

The maintenance facility of any golf course plays a pivotal role in the efficient and safe delivery of a quality service for members and guests. Good operational planning and attention to legislative compliance ensures sustainable levels of maintenance and management, ultimately enhancing the consistency of preparation and presentation of the golf course, as well as having a positive impact on staff morale.

The maintenance facility will consist of a prefabricated shed, that includes a wooden structural frame with suitable external cladding. Likely wooden boards on external walls.

- All columns and base plates;
- Columns will be pre-cut with knee gussets and applied ready for site assembly;
- Rafters will pre-cut with apex gussets – which are then applied by builder on site.
- Roof purlins – fitted on site by builder;
- wall girts supplied – fitted on site by builder;
- All brackets and fixings for the shed for on-site assembly; and
- Shed will have engineers certification and corresponding plans.

A concrete apron will then be poured to provide access at the plant and for entry into containers and the storage shed, the concrete apron will be poured in accordance with the engineering design.

Engineering Design

The engineering design has included the following design elements;

- The conceptual layouts provided aim to maximize efficiency of staff and equipment movements, while being mindful of the interaction with golfers and other staff;
- The staff amenities/administrative section of the maintenance facility is located close to the golf shop/kiosk to assist communication with golf operation staff. The layout of the amenities area aims to promote good housekeeping, with lockers and toilet facilities the first areas to be accessed.
- A designated wet store area is to be provided within the locker room to house wet weather clothing after use and reduce likelihood amenities floors becoming wet and slippery;
- Material bays are located adjacent the facility entrance to reduce the need for heavy vehicles to unnecessarily impede on the facility compound;
- Wash bay area designed on a concert pad with pit/storage tank, oil/water separator, with a bunded area around the perimeter and appropriate signage;
- Rainwater collection from the facility roof and storage is proposed to provide a primary water source for spraying operations and reduce potable water usage as much as possible.
- Internal specifications include;
  - Ceilings to be 2.8 metres.
  - All walls and ceilings to be plaster and painted with quality paints with a minimum of two coats.

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  - Floor covings in entire amenity area to be commercial grade “non slip” vinyl and extend 100mm up walls.
  - Locker rooms, toilets and laundry/drying room to be fitted with floor drains.
  - All external walls and amenity area roof to be insulated.
  - Split system (with independent control for each room) heating and cooling to be included in entry, offices, reception and lunchroom.
  - Alarm system (to detect movement) to be included in amenities area and workshop and store area of main shed with keypad situated near personal access door; and
  - All internal lighting to have master override point near personal access door.
- General shed specifications include;
  - Roller doors to be electric with independent control and manual override, with 1.5-metre-wide concrete entry pads;
  - Laserlight (tinted) skylights to be incorporated in roof over workshop area (x 3), Fertilizer store (x 1) and storeroom (x 1);
  - Wall between shed and Amenities area to be insulated, clad in cement sheet and painted;
  - Stormwater to be discharged to rainwater tanks on western side of facility;
  - Concrete floor to all shed (125mm – F72) and amenities area;
  - Compressed air connection points, double power points and 3 phase power to be supplied as marked. Note: all external power points to be weatherproof;
  - Lighting: Internal - To be suitable for machinery storage, with central zoned switches (near personal access point); and
  - Lightning External - 6 x Security lights (Lumatrol activated) to be included on north and east walls.

Site Arrangement

The arrangement of the maintenance facility will include the following areas;

- Main shed and workshop;
- Storage area;
- Interception strip drainage and collection pit;
- Hardstand apron;
- Staff car parking and
- machinery parking and yard;
- Landscaping and dune development for screening;
- Security fence; and
- Rainwater tanks

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Wastewater from the wash down will be treated on site for re- use in equipment washing, or used for other suitable uses around the facility, or will be stored in a holding tank for collection and management by an accredited wastewater disposal operator.

Café/Pro Shop

The Café/ pro shop will incorporate a contemporary design, allowing for staffing efficiencies, flow of people, connections to car parking/ pedestrian paths and has included the following works.

Architectural Design

An architectural firm has been engaged to complete concept schematic designs for the café/pro shop and has included the following elements;

- Natural finish cladding;
- Deck areas;
- Office space;
- Storage;
- Amenities;
- Pro shop and retail area;
- Dining space;
- Kitchen.

The concept design package has included the following elements;

- Site plan;
- Floor plans;
- Construction budget estimates;
- Sections;
- 3D sketch;
- Energy considerations.

Engineering Design

On completion of the architectural design an engineering firm will be engaged to complete the detailed engineering of the building, including services (Electrical, sewage lightning etc.).

3.5.2 Construction Methodology – Maintenance Facility

The construction of the maintenance facility will be completed by undertaking the following work items:

Site Setup

The contractor will set up the work site which at a minimum will cover the following key aspects;

- Site works fencing and signage;

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- Entry and exit points;
- Pedestrian access and appropriate exclusion zones around construction site and moving equipment;
- Designated plant and equipment zones; and
- Traffic management systems.

Plant and Equipment

The typical plant and equipment used for the maintenance facility works is as follows;

- Utility vehicles;
- Elevated work platforms;
- Crane;
- Building equipment.
- Scaffolding
- Excavator;
- Backhoe;
- Trucks;
- Temporary site office/amenities; and
- Utility service locator.

Site Induction

All personnel working on site will complete a pre-commencement site induction. The induction will cover off on the following items,

- Implementation of construction requirements of the EMP;
- Location of all site facilities;
- Understanding of evacuation procedure and muster points;
- PPE designated zones;
- Use of different UHF channels in different construction zones;
- Understanding of all site restrictions especially around specific requirements of the different work and access zones. The key focus will be stakeholder communication and the requirements of safe access for the public;
- Traffic Management zoning for Arm End;
- Key personnel contact information;
- Signing on to all SWMS for the project;
- Description of the scope of works for the project;
- Requirements of daily sign on and off;
- designated site parking areas; and

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- All site-specific details.

To manage natural values, landscaping and rehabilitation of the site, specific management zones for the construction works will be established by the contractor. All construction works will be undertaken in accordance with this EMP.

Off – site Fabrication

The design for the infrastructure works will incorporate, where appropriate, major off-site construction and prefabrication to limit the onsite works and construction impacts on the outlined work areas.

This work will include (but not limited to):

- Pre-fabrication of columns, roof purlins, wall girts rafters and base plates; and
- All brackets and fixings for the shed for on-site assembly.

On – site Fabrication

The on-site fabrication will include:

- Roof purlin, wall girts and columns connection; and
- Base and subbase preparation.

Hygiene Protocols for all Construction Activities to manage weed and disease control, must include a dedicated hygiene and washdown point or station. This control item must be established prior to works commencing (refer to Section 7.2).

3.5.3 Construction Methodology – Café/Pro Shop

The construction of the café/pro shop will be completed by an accredited builder/construction company to meet the requirements of the design specifications and in accordance with the Building Act.

Site Setup

The contractor will set up the work site which at a minimum will cover the following key aspects;

- Site works fencing and signage;
- Entry and exit points;
- Pedestrian access and appropriate exclusion zones around construction site and moving equipment;
- Designated plant and equipment zones; and
- Traffic management systems.

Plant and Equipment

The typical plant and equipment used for the maintenance facility works is as follows;

- Utility Vehicles;
- Elevated work platforms;
- Crane;
- Building equipment.

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- Scaffolding
- Excavator;
- Backhoe;
- Trucks;
- Temporary site office/amenities; and
- Utility service locator.

Site Induction

All personnel working on site will complete a pre-commencement site induction. The induction will cover off on the following items,

- Implementation of construction requirements of the EMP;
- Location of all site facilities;
- Understanding of evacuation procedure and muster points;
- PPE designated zones;
- Use of different UHF channels in different construction zones;
- Understanding of all site restrictions especially around specific requirements of the different work and access zones. The key focus will be stakeholder communication and the requirements of safe access for the public;
- Traffic Management zoning for Arm End;
- Key personnel contact information;
- Signing on to all SWMS for the project;
- Description of the scope of works for the project;
- Requirements of daily sign on and off;
- designated site parking areas; and
- All site-specific details.

To manage natural values, landscaping and rehabilitation of the site, specific management zones for the construction works will be established by the contractor. All construction works will be undertaken in accordance with this EMP.

Hygiene Protocols for all Construction Activities to manage weed and disease control, must include a dedicated hygiene and washdown point or station. This control item must be established prior to works commencing (refer to Section 7.2)

3.6 Phase 6 - Interpretation signage and public recreation areas

The installation and formalisation of the interpretation signage and public recreation areas will be undertaken prior to the site's official opening. The implementation of the signage plan for Arm End will be completed in conjunction will the rollout of the phases of construction works

Preparatory works have included the following:

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3.6.1 Design & Investigations

Signage Plan

A signage plan has been completed for the Arm End site (Appendix E). This signage plan outlines the proposed approach that the Arm End project will aim to deliver including;

- Promotes and reflects the character of the Arm End Recreation Reserve, through scale, voice, material and colour choices;
- Is approachable, easy to follow and can be understood by all nationalities - through siting, topography, and iconography.
- Is cost effective to manufacture and easy to install and maintain - through material choice and effective design system; and
- Promotes a sense of ownership and pride - through accessible, beautiful design and engaging storytelling.

The implementation of the signage plan for Arm End will be completed in conjunction will the rollout of the phases of construction works identified above. Signage plans will be developed and issued to CCC and PWS for each phase of works and includes;

- **Site Access, Car park -** signage will be implemented as per the detailed civil design drawings (Refer Appendix N).
- **Irrigation Network** - a signage plan will be implemented to outline the use of recycled water, public health notification etc. These will be implemented on site when recycled water is being used on site;
- **Golf Course -** will need to have signage for holes, tees, directional, general information and interpretation for the golf course requirements etc. These will be implemented on site when the golf course has been built;
- **Cafe pro shop and maintenance facility** - signage for general information and operations at the maintenance facility, and for the café /pro-shop; including directional signage, information on the golf course and nature recreation area, including a map, times to use facilities etc. This will be implemented on site when the café/pro shop and maintenance facility have been built.

Immediate Signage

Immediate signage includes the entrance sign to inform visitors to the site. Further regulatory signage, boundary sign, visitor information, compliance and safety plinths and signage location (refer to Appendix E).

The signage is designed to:

- Welcome visitors to the site;
- Provide basic information about the reserve and the Arm End project;
- Allow visitors to safety visit the reserve during construction;
- Communicate regulatory messaging (dogs on lead, no fires etc.);
- Communicate Leave No Trace messaging; and
- Promote respectful visitation.

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3.7 Project Construction Schedule

A summary of the proposed construction works schedule for the Arm End site are outlined in Table 1 below.

Table 1 Project Phases

Project Activity	Timeframe
Phase 1 - Weed Management, Rehabilitation & Revegetation	On-Going
Phase 2 - Site Access & Civil Works, including establishing water storage tanks. All relevant signage to be implemented	Commence - August 2022 Complete - September 2022
Phase 3 - Irrigation Network • Main irrigation line • Irrigation pipeline connections to golf course and revegetation zones All relevant signage to be implemented	Commence - August 2022 Complete - December 2022 Commence (early works) - September 2022 Complete - April 2023
Phase 4 - Golf Course • All relevant signage to be implemented	Commence (early works) - August 2022 Complete - August 2023
Phase 5 - Café/Pro-shop & Maintenance Facility • All relevant signage to be implemented	Commence - January 2023 Complete - August 2023
Phase 6 - Installation of interpretation signage and formalisation of public recreation areas	Commence (early works) - August 2022 Complete - August 2023

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4. Operations Environmental Management

4.1 Approach

The vision for Arm End is for the reserve to be managed as a nature area where people can experience a beautiful natural setting while engaging in a variety of recreation activities. Arm End management recognise the importance for designing, construction and managing the Arm End Site in an environmentally sustainable manner. The site will provide significant benefits to the environment under the safeguard that it will be built and managed using best management practices.

Site management will be proactive and responsive through undertaking a range of operational activities that will ensure effective environmental management of Arm End. This will be achieved by implementing a management strategy that recognises the significance of the natural and cultural values of the reserve, while needing to balance their management with the use and development for recreation and visitor infrastructure, to achieve a sustainable outcome.

The Arm End operations will ensure a high standard of design, safety and maintenance of visitor infrastructure, including the trail network; and will continue to support key stakeholder partnerships, which contribute to the management and enjoyment of the Arm End reserve, including with community organisations such as the South Arm Peninsula Residents Association.

All site obligations from regulatory approvals, issued to the Arm End project will be complied with. This includes the requirements of the Unanticipated Discovery Plan (refer to Section 7.6), for any Aboriginal Heritage items encountered during operational works. All requirements of the Unanticipated Discovery Plan for the management of potential/new heritage discoveries will be made accessible for direct reference by site operational staff during all works.

4.2 Environmental Management

4.2.1 Education and Training

Establishing, maintaining and improving environmental management of public recreation areas/golf courses/ requires an effective education and training program for all staff. The adoption of best environmental management practices can only come about with education and training so that staff are aware of the following;

- the aims and objectives of the operation of the golf course facility;
- the benefits to the course, golfers and the community of best environmental practices;
- the legislative requirements governing golf course management;
- good environmental stewardship (including being able to recognize environmental problems and implement solutions); and
- safe operating procedures.

Staff training can be undertaken by various means depending on the needs of management and the individual. Specific areas of training will include:

- pesticide spraying and chemicals management;
- irrigation;

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- stormwater management;
- soil management (including erosion and sediment control);
- mowing and turf care;
- management of fertilizing requirements;
- vegetation management and
- equipment maintenance.

Written procedures will be implemented and supported when carrying out designated duties. Appropriate induction sessions will be undertaken to ensure that staff have an adequate understanding of what is expected. Continual learning through education and training, both on the job and off the job, will ensure that staff maintain and extend their skills and motivation and are able to comply with legislative requirements and environmental best practice.

Good staff training ensures that resources will be used efficiently. Water and fertiliser use, weed management, and land management are dependent on well-trained staff who understand the principles behind what they are doing and the environmental and economic benefits of good practices.

4.2.2 Public Access

Public access will be always provided. However, restrictions will apply during the construction phase, due to the requirements of the WHS Act

Adequate and appropriate interpretive signage will inform and educate the public of the recreational opportunities available at Arm End. Visitor amenities and car parking will be provided and formalising a shared pathway network will offer safe and effective use of the reserve and assist Arm End operations in controlling potential impacts. A defined and maintained trail network will initiate connectivity for users of the shared pathways. Targeted tree/shrub plantings (outlined in the Landscaping Management Plan – Appendix D) will screen and provide a safety buffer between land use activities on Arm End.

4.3 Natural Values Management

4.3.1 Biodiversity

An integral component of the Arm End project is to adequately manage and control the environmental weeds and enhance the condition of the site. This process will enable revegetation and promote the establishment of native species and fauna habitat. An assessment of the botanical values of the site has been completed in 2016. This assessment was then used to develop a Weed Management and Revegetation Plan for the site.

4.3.2 Weed and Revegetation Management

Since the approval of the Weed Management and Revegetation Plan (Appendix C). a number of high priority weed management actions have been completed with regulatory authorities being provided updates. Work continues to manage the broad scale control of significant weeds on site. Additional rehabilitation and large-scale revegetation will be completed to improve and enhance the amenity of the site, provide critical habitat for native fauna and provide screening and landscaping for the public trail network and golf course.

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The revegetation of the site represents an important element of the Arm end project, the key aspect of the revegetation program will be the landscaping of the golf course and associated facilities. The Landscape Management Plan (Appendix D) outlines the detail of plantings; however, the plant species lists, site preparation, monitoring and maintenance controls outlined in the Weed Management and Revegetation Plan will apply to all plantings.

Hygiene measures

The hygiene protocols outlined in the Weed Management and Revegetation Plan will be implemented at the site to adequately manage and minimise the potential to spread weeds across the Arm End site.

4.3.3 Avi-Fauna Management

An assessment of the raptor nest records identified at Arm End has been undertaken, 2020. A visual site inspection of the nests indicated that no nests, either from White-bellied Sea Eagle or Peregrine Falcon were evident. The assessment letter report is provided in Appendix M.

Bird Sanctuary

Arm End Spit is an important breeding, feeding and roosting (resting) site for many species of birds on Arm End. Resident and migratory shorebirds (waders) use the Spit throughout the year, and many species of seabirds can be seen here most days of the year.

The Arm End project, in consultation with Birdlife Tasmania, is proposing to establish a Bird Sanctuary at the Arm End Spit. The aim is to protect the sensitive bird habitat from disturbance by humans and dogs.

Interpretation signage will be established at top of the grassy rise overlooking the terrace and Spit, with content on shorebird and seabird values of the Spit - text and images to be provided by BirdLife Tasmania.

BirdLife Tasmania members will be granted access to the Spit for bird surveys and ongoing long-term monitoring efforts - Summer and Winter Wader Counts, Winter Gull Count, other Atlas surveys etc. BirdLife representatives will be required to communicate and provide detail on the works to be conducted, with Arm End management prior to site activities commencing.

No golfers will be allowed onto the terrace and Spit to recover errant balls from the adjacent gold course.

No vehicular access is allowed onto the Spit (unless an emergency of approved by Arm End management) to manage and minimise disturbance to nesting oystercatchers (Aug - Mar) and roosting resident and migratory shorebirds (year-round) and seabirds (year-round).

There will be no re-vegetation of terrace or Spit area, however weed management will be undertaken. A preliminary survey to assess the location and identification of all invasive weeds present on the Spit will be undertaken and weed management completed in accordance with the site Weed Management & Revegetation Plan.

The Arm End development is unlikely to have a significant impact on the fauna at the site if mitigation measures to reduce potential disturbance to shorebirds are implemented. The proposed revegetation works will benefit native terrestrial bird species that are currently restricted to the narrow coastal strip of remnant native vegetation. Accordingly, it is important for the natural values of the site, if this proposed Bird Sanctuary at the Spit is approved and established. This includes cultural heritage, which investigations identified the Spit Area as significant for conservation.

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4.3.4 Water Management

Recycled Water Quality Management Plan

A Recycled Water Quality Management Plan (RWQMP) has been completed for the use of recycled water, it documents the ongoing management strategy for recycled water treatment, monitoring and supply. The RWQMP will guide compliance in accordance with the Australian Guidelines for Water Recycling: Managing Health and Environmental Risks, Phase 1 (2006) (AGWR). The RWQMP is based on the 12-element risk framework of the AGWR.

The purpose of the RWQMP is as follows:

- Define the roles and responsibilities of South Arm Pipeline, as the recycled water supplier;
- Ensure that the production and supply of recycled water is fit-for-purpose;
- Provide detailed information of the validation and treatment process;
- Outline the process controls and monitoring procedures necessary to produce water of an appropriate quality for the proposed end use; and
- Define the assessment process and day to day operation and management of the scheme.

Refer to Appendix R for a copy of the RWQMP

IEMP

An Irrigation Environmental Management Plan (IEMP) has been developed for the use of Class A recycled water (2021). The IEMP has been developed specifically for the Arm End site and golf course and describes how and where recycled water will be used. The plan has been developed in accordance with the Australian Guidelines for Water Recycling: Managing Health and Environmental Risks, Phase 1 (2006) (AGWR) and Environmental Guidelines for the Use of Recycled Water in Tasmania (DPIWE, 2002), and describes the measures to be implemented to protect public health and manage environmental sustainability. This document will be used as the basis for ongoing environmental monitoring (related to recycled water) and future auditing of recycled water activities on the site.

Refer to Appendix O for a copy of IEMP.

Environmental Monitoring Plan

An Environmental Monitoring Plan (EMP) for the Arm end site has been completed, in consultation with the National Handfish Recovery Team (NHRT), CSIRO and in conjunction with experts in marine ecology The intent of this EMP is to undertake the following;

- Undertake groundwater and surface water sampling for the pre-construction period to understand current baseline conditions;
- Undertake groundwater and surface water sampling for the golf course construction; and
- Undertake groundwater and surface water sampling for the operational use of the recycled water at Arm End.

The objective of the EMP is to meet our regulatory conditions, contribute to handfish research and be active stewards for the environment.

Refer to Appendix P for a copy of EMP.

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Nutrient Management Strategy

In addition, a Nutrient Management Strategy for the golf course has been developed and will be implemented during operations to manage;

- Nutrient inputs and water demand requirements for the golf course;
- Understand existing soils (physical and biological properties);
- Select appropriate turf species;
- Manage irrigation (design and scheduling); and
- Monitor soils, moisture and water quality

Refer to Appendix Q for a copy of Nutrient Management Strategy.

4.3.5 Geoconservation

The Mary Ann Bay Shelly Sands have been discussed with a representative of the Natural Values Conservation Branch of DPIPWE. Management controls have been agreed and are formalised and outlined in more detail in Section 7.5.

In summary, a meeting (9 March 29, 2021) and further email discussion has been undertaken with Jason Bradbury – Geoscientist from DPIPWE. The key items agreed are as follows;

- Mineral Resources Tasmania (MRT) has defined the extent of the Mary Ann Bay Shelly Sands adequately - no further investigations are required to be undertaken;
- Arm End plans provided and reviewed, outlined the extent of infrastructure and the works footprint in relation to the MRT mapped geo-conservations area (Condition 7 of RAA subsequently met);
- Pre-works inspection required (prior to major civil works) - to enable analysis of the geo conservation area. Inspection to be undertaken by DPIPWE representatives (includes digging test pits to allow samples to be taken and undertake further analysis - e.g., potential for dating materials;
- Pre-works inspection will help understand the nature of the landform - whether its marine or aeolian in nature - will contribute to the scientific understanding of the Mary Ann Bay Shelly Sands geo-conservation area;
- During construction – minimisation of works that change the landform of the Mary Ann Bay Shelly Sands;
- During construction - minimal ground disturbance of the Mary Ann Bay Shelly Sands (as outlined in the plans presented in the meeting - only a low percentage of the geo-conservation area to be impacted by the golf holes and development;
- It is important to maintain the existing cliff face exposure of the cross section through the Mary Ann Bay Shelly Sands. The cliff face west of the beach for about 200m should not be obscured, nor access blocked - after weed removal and revegetation has been completed.
- Opportunity for further investigations by DPIPWE, (on as required basis), for more scientific understanding of the Mary Ann Bay Shelly Sands.

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4.3.6 Soil Management

Acid Sulfate Soils

A key component for the efficient utilisation of Arm End site, for both a public recreation area and golf course, is to use recycled water for its irrigation requirements. An IEMP has been prepared to describe how recycled water will be safely and sustainably utilised on the site. The scope of the IEMP included assessing the site's soil capability and if any risks occur, particular in terms of potential acid sulfate soils (ASS). The IEMP completed a site investigation that include taking soil samples, four (4) test pits were excavated and assessed, with topsoil and subsoil samples collected for laboratory analysis of chemical and physical properties. Based on this assessment the risk of ASS is considered very low for the site where works will be undertaken.

The low-lying area of the Spit is identified as having a high probability of ASS occurring, however, The Spit area will be dedicated as a Bird Sanctuary, accordingly this area will not be used for the Arm End development.

Standard soil management practices, recommended for all irrigated land, should apply to the development and ongoing management of the Arm End site. These practices include:

- Minimising the period of time that soils are fallowed;
- Maintain ground cover as best as possible throughout the year;
- Encourage productive vegetative plant growth;
- Avoid deep soil tillage and keep the subsoils (which are slightly sodic) covered; and
- Where topsoil is moved, ensure that it is replaced.

Refer to Appendix O for a copy of IEMP.

Soil Monitoring Program

Arm End will engage a suitably experienced consultant to undertake topsoil monitoring on an annual basis.

Soil monitoring will commence post construction of the golf course, once landscaping is complete, and no later than within three months of irrigation commencing (which allows for irrigation on some areas to commence in line with likely construction).

Sampling and analysis will be in accordance with the *Environmental Guidelines for the use of recycled water in Tasmania, 2002*. Transects will be plotted for annual topsoil monitoring. Subsoil sampling is recommended on a five-yearly basis (unless there are concerns identified from topsoil monitoring that require further investigation to determine any issues at depth).

Topsoil samples are to be taken as transects across the recycled water irrigation areas, and include the following sites:

- Fairways and greens on the 4th, 7th, 11th, 15th and 18th holes.

Soil monitoring data will be reviewed by a suitably experience person (agronomist) and be utilised to inform soil conditioning and fertiliser programs. Data will be accumulated overtime to observe trends and inform future soil management practices.

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Erosion and Sedimentation Management

The programming of works and implementation of control measures has a major influence on how effective erosion and sedimentation controls are in reducing on-site disturbance and any potential impacts to the receiving environment. All operational works will be completed in accordance with the procedures outlined in Section 7.7. It is noted that general operational works will be minor in terms of potential ground disturbance. Typically, operational works include manage the turf of the fairways, greens and tees.

Where operation works involves revegetation and erosion works the Weed Management and Revegetation Plan (Appendix C) will be implemented to manage any works. Generally, these works involve the following;

- Use of erosion control matting (such as jute matting);
- Preparation of ground after undertaking weed control works;
- Direct planting, if soil profile occurs under erosion matting;
- If there is no adequate topsoil, use of a matting that contains native grass seed will be used to stabilize the site and enable an organic layer to form.

4.4 Cultural Values Management

Aboriginal Heritage

Field survey assessments of the Aboriginal Heritage values at the Arm End site have been undertaken and reported as follows:

- *Arm End Recreational Reserve: Aboriginal Cultural Heritage Assessment*, Cultural Heritage Management Australia (CHMA), 2012; and
- *Proposed Arm End Recreational Reserve Aboriginal Heritage Assessment Phase 2: Post Vegetation Burn Off Inspection* Final Draft Report, CHMA, 14th May 2014.

The CHMA (2012) assessment identified 29 registered Aboriginal heritage sites within the Arm End Reserve study area.

Prior to the Phase 2 assessment, the Parks and Wildlife Service undertook a fuel reduction burn off across the majority of the site. The CHMA (2014) Phase 2 assessment identified 2 new Aboriginal heritage sites in addition to the original 29 sites to make 31 sites in total, made up of the following:

- Twenty (20) shell midden sites;
- Ten (10) shell midden sites with associated stone artefacts; and
- One (1) site complex (TASI 7131) comprising of shell midden deposits, stone artefacts, a scarred tree and 'modified' glass artefacts.

Due to improved surface visibility following the burn off, the CHMA (2014) Phase 2 assessment also recorded evidence for the extension of boundaries of 5 of the 31 registered Aboriginal sites.

As outlined above a detailed aboriginal heritage survey has been completed for the Arm End Public Reserve site. The report highlighted manage controls that would be required for the works.

A subsequent aboriginal permit – **P71** has been issued by the Minister. All works will be completed in accordance with **P71** and have been included in this EMP. All identified cultural heritage sites outlined in **P71** have been included, via GIS mapping in the design of the site, including the golf course component.

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All cultural heritage sites outlined in **P71** will be demarcated and adequately fenced for the construction works (refer appendix L for a copy of P71).

All the monitoring and management controls outlined in Section 7.6 will be implemented for the construction and operations of the project.

After discussions and review of this EMP_V1, with PWS and AHT a subsequent Aboriginal Heritage Assessment has been completed for the site access road, car park, water tanks and maintenance area. As well as the broader issues of sensitivity at the site.

All recommendations from this Report will be implemented for the project.

A copy of this Report is provided in Appendix W.

If during the process of undertaking the operational works, suspected Aboriginal sites or skeletal remains are encounter, then the Unanticipated Discovery Plan (refer to Appendix X) will be implemented.

European Heritage

The site has an extensive European history, with the Gellibrand Vault being an active heritage site. The Gellibrand Vault and surrounds will remain private, and fenced off, but will be fully interpreted, to inform visitors about the family history and the significance of the vault. There will be no disturbance to the vault or other perceived heritage values. The installation of interpretive signage and protection and of this site's conservation significance is the main priority.

All site management regulatory obligations will be implemented, in particular no work to be undertaken in the immediate vicinity of the Gellibrand Vault to ensure it is protected. Landscaping and track upgrade works in the vicinity of the Gellibrand Vault will be retained at act a s a buffer between the Vault and the Arm End Development.

Any potential works on or near the Gellibrand Vault, will need to be approved by CCC, PWS and the Gellibrand family prior to being commenced.

4.5 Shared Pathway Network - Pedestrian and Cycling

An enhanced trail network will be one of the most significant assets within the Arm Ends public reserve, providing opportunities to exercise and walk the dog in a natural setting. Walkers are the dominant recreational user group accessing the reserve. Currently the trail network is relatively informal, with historically vehicle paths and foot pads (unmade paths worn into the vegetation through frequent use) developed along 'desire lines' over many years. Some sections of the trail network are in poor condition (e.g., steep, with evidence of erosion, rough/uneven underfoot, or difficult to locate), however, they do provide a good basis for an upgraded network with the options for shorter or longer circuits.

The construction of the shared public walking and cycling trails will be designed to a width, and standard to accommodate shared and ongoing use by cyclists & foot traffic (Australian Walking Track Standards AS 2156.1). Improved or existing tracks on the natural landform which suffer wear'n'tear or erosion degradation, will be maintained or upgraded as required to ensure their sustainability.

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4.6 Irrigation Management

4.6.1 Recycled Water Use

Arm End was originally proposing to use Class B recycled water at the Arm End site. It has now been determined by the Arm End Board that the benefits of shared recycled water will be far greater if quality is improved to Class A recycled water. Accordingly, the Arm End site intends to use Class A recycled water.

The assessment to use Class A recycled water is currently with the Environment Protection Authority (EPA) Tasmania. The EPA advised, as part of the assessment that a recycled water quality management plan (RWQMP) would be required for the ongoing management strategy for recycled water treatment, monitoring and supply.

The purpose of the RWQMP is as follows:

- Define the roles and responsibilities of South Arm Pipeline, as the recycled water supplier;
- Ensure that the production and supply of recycled water is fit-for-purpose;
- Provide detailed information of the validation and treatment process;
- Outline the process controls and monitoring procedures necessary to produce water of an appropriate quality for the proposed end use; and
- Define the assessment process and day to day operation and management of the scheme.

As outlined above in Section 4.3.4 - Water Management, a RWQMP and an Irrigation Environmental Management Plan (IEMP) has been developed for the use of Class A recycled water.

Refer to Appendix R for a copy of the RWQMP.

Refer to Appendix O for a copy of IEMP.

4.6.2 Design

A rainbird irrigation is proposed for the site irrigation requirements. These systems provide the flexibility for effective management controls to be implemented due to the following key features;

- Remotely controlled, computerized and smart interactive system that will enable multiple irrigation zones that can be separately controlled and directed by site conditions and approval requirements;
- Provide real time soil moisture monitoring, directly feeding into irrigation control;
- Has a weather station to manage climatic conditions and inputs; and
- Consists of several small pop-up sprinkler heads.

A preliminary design for site irrigation and the main irrigation network is provided in Appendix T.

Due to the number of work phases required for the Arm End site, and the requirement to commence works for site access - car parking, maintenance area, water storage tanks and associated civil works, proceeding the irrigation network phase. The detailed design for the irrigation networks has not been finalized, however, it has commenced, and the irrigation detail is progressing, and when complete will be issued for approval.

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4.6.3 Advance Technologies

Th irrigation control technologies will be managed by the central control system that enables Software operating on a PC under Windows with communication interface and site connection cabinet that allows for permanent communication with the site for real-time water management. These advanced technologies will offer many benefits for water management on site, including.

Water savings:

- The watering times are calculated daily based on ET;
- Takes account of the precipitation rate of each station;
- Hydric balance: takes account of the ground storage capacity and usable precipitation;
- Watering cycle and soak time: elimination of puddling and run-off;
- Water budget of 0 to 300%;

Reduction of watering time, energy savings, operating security:

- The flow manager takes account of the characteristics of the network in order to optimise the hydraulic operation;
- Takes account of 6 pump stations or water supply points;
- Simulation and graphical representation of instantaneous flow;

Graphic functions:

- Integration of site plan from AutoCAD or Shape files;
- Display of sprinklers in operation;
- Can start a watering zone by clicking with the mouse on the site view;

Programs:

- Maximum number of programs: 100;
- Number of programs managed simultaneously: 20;
- 6 starts per day and per program;
- Number of sequences per program: 25;
- Printing of programs and reports;
- Maximum number of decoders active simultaneously: 15;

Remote control:

- Possibility of remote control (starting stations or programs) by telephone;

Off-site maintenance:

- Possibility of performing off-site maintenance via modem; and
- Automatic weather station with phone or wire connection for central control systems.

4.6.4 Irrigation Buffer Zones

For irrigation of Class A recycled water, a nominal buffer zone of 20m has been applied, as mitigation for preventing irrigation water leaving the site and potentially transferring nutrient to adjacent receiving waters.

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Irrigation control zones will be established to manage more sensitive irrigation areas, like the listed natural values of the site.

When the site is developed, the irrigation system will be tested in varying weather conditions to determine the appropriate programming for effective control of irrigation water.

More detail is provided in the IEMP in Appendix O

4.6.5 Irrigation Monitoring

As outlined in Section 4.3, the natural values of the site will be scrutinized by the implementation of an environmental monitoring program that includes;

- Soil monitoring;
- Surface water monitoring; and
- Groundwater monitoring;
- Nutrient Moni

More detail is provided in the IEMP in Appendix O

The geoconservation area has been discussed with a representative of the Natural Values Conservation Branch of DPIPWE. As outlined in Section 4.3.5, no requirement was indicated for the monitoring of the geoconservation site in terms of irrigation use at Arm End.

The design of the irrigation network as discussed above will manage potential impacts to cultural heritage, geoconservation and other natural values by having smart interactive system that will enable multiple irrigation zones that can be separately controlled and directed by site conditions and approval requirements.

4.6.6 Reporting

An annual recycled water monitoring report will be provided to regulatory authorities.

More detail is provided in the IEMP in Appendix O

4.7 Emergency, Evacuation and Bushfire Management

Arm End readily acknowledges and accepts it's moral and legal responsibilities to Health, Safety and Environment. Arm End is committed to emergency, bushfire and evacuation management.

As part of the process of meeting this obligation, the following documents have been completed.

Emergency Response Plan

The Emergency Response Plan (ERP) is designed to provide guidance on how to manage the occurrence of specific emergencies that may occur.

It is a process of **"preparing for the unexpected**" and the Emergency Response Plan is supported through training and undertaking of drills or exercises with local Emergency Services to ensure all parties are suitably skilled and ensure the ongoing review and improvement of its content.

The plan applies to Arm End and contract employees, contractors and consultants engaged through Mary Ann's Island Pty Ltd for the Arm End Project.

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Refer to Appendix F for a copy of the ERP

Bushfire Hazard Management Plan

The intent of the Bushfire Hazard Management Plan (BHMP) is to confirm the suitability of the Arm End site to be successfully further developed for the future vulnerable use in accordance with the Clarence Interim Planning Scheme and the Building Regulations.

The bushfire assessment concluded, that considering the current conditions, and in accordance with AS3959-2009, the Arm End site can achieve a BAL-LOW with the proposed development and ongoing Hazard Management of the golf course, recreational rears and low threat vegetation zones that are all able to be considered *Low Threat*.

The BHMP has proposed to include a 100m bushfire hazard management area at the southern boundary urban interface.

Refer to Appendix G for a copy of the BHMP

Bushfire Emergency Plan

The purpose of the Bushfire Emergency Plan (BEP) is to outline procedures for occupants and site management to follow in the event of a bushfire emergency. The plan comprised of the following items;

- Bushfire Emergency Plan; and
- Bushfire Action Plan.

The plan will be reviewed annually, prior to the bushfire season.

Refer to Appendix H for a copy of the BEP.

Management of Hot Works

In the event of an extreme/catastrophic fire danger or a Total Fire Ban. Arm End operations will take a common-sense approach to eliminating any chance of starting and or causing fire.

The following operational procedures will be implemented:

- No mowing will occur;
- No brushcutting will be undertaken;
- No grinding in the workshop (includes grinding of mower reels);
- No smoking;
- Refrain from any activity that may cause sparks e.g., grading of roads/paths etc.;
- No filling of mowers/jerry cans with any type of fuels; and
- Monitoring of the site will be undertaken during such an event to manage any potential fire arising.

4.8 Communications Plan

Arm End has developed a Communications Plan to define the projects vision and objectives, while identifying key community and land management stakeholders and to detail processes for effective communication.

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The content of construction communications aims to:

- Raise positive awareness of the project and its range of benefits, building a broad base of interest;
- Provide transparent and timely information to stakeholders and community members
- Build and enhance relationships with all stakeholders.
- Co-operate with regulatory bodies and comply with approval regulations.
- Encourage collaboration; and
- to build respect and a reputation for the Arm End project team for honesty, transparency and integrity

The Communications Plan includes communication objectives, channels, timing and triggers, reporting procedures and requirements, key messages and roles.

Refer to Appendix I for a copy of the Communications Plan

4.9 Safety Management

Arm End Management has many legislative, moral obligations and responsibilities to provide both a safe working environment for all employees and subcontractors, as well as an obligation to protect the environment.

Management is firmly committed to a policy enabling all work activities to be carried out safely, and with all possible measures taken to remove (or at least reduce) risks to the health, safety and welfare of employees, contractors, visitors, and anyone else who may be affected by our business or undertakings. Arm End has developed a Management System which aims to meet these obligations.

It is to be understood that ***safety is everyone's responsibility*** and that everyone has to play their own individual part. All employees must accept the responsibility and observe the safety rules and regulations applicable to the workplace. All unsafe acts or conditions will be reported promptly to workers immediate supervisor or Arm End Management. Operations will be undertaken to ensure, as much as practical that there is a low-risk environment for visitors within Arm End.

A Workplace Health & Safety Policy Manual (WHS Policy Manual) has been developed and will be implemented to ensure that all staff and customer requirements are satisfied and is applicable to all activities undertaken by Arm End.

The manual has been prepared for work situations and contracts which are to be guided by AS/NZS ISO 4801:2001 standard for Occupational Health and Safety Management Systems and AS/NZS ISO 14001:2004 standard for Environmental Management Systems.

We are committed to ensuring we comply with the Work Health and Safety Act 2012, the Work Health and Safety Regulations 2012, relevant Codes of Practice and relevant Australian Standards.

Refer to Appendix J for a copy of the WHS Policy Manual

Applying Safety Policy

We seek the co-operation of all workers, contractors, visitors and others who may be affected by our business or undertakings.

We encourage and support suggestions to create a safe working environment as a result of all possible preventative measures being taken.

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This policy applies to all business operations and functions, including those situations where workers are required to work off-site.

4.9.1 Public Health Risk Management

Recycled Water

Class A recycled water must meet stringent microbiological health standards before it is fit for the purpose for irrigation. This will be achieved by tertiary and advanced treatment processes (including ultrafiltration and disinfection).

The EPA have advised that the Arm End site provide the appropriate framework for development, approval, and ongoing management of Class A recycled water irrigation schemes. Consequently, a RWQMP in line with the 12-element framework provided by those guidelines, has been preprepared (Appendix R).

A Hazard Analysis and Critical Control Point (HACCP) approach was used as a preventive risk management framework for the Class A RWTP. This included an assessment of the whole treatment and distribution system to identify appropriate management controls for the risks associated with hazards and hazardous events. Measures to manage risks to public health (including monitoring and reporting programs) are discussed further in the RWQMP.

Key management strategies to protect public health during the operation of a Class A recycled water irrigation scheme include the nomination of a scheme manager to engage with and manage recycled water users, the development of an EPA approved scheme management plan (IEMP- Appendix O), scheme auditing and regulatory reporting.

The Arm End site is a public recreation reserve, managed by Parks and Wildlife Service - Property Services As irrigation water will be Class A quality, no restriction on public access is required (DPIWE, 2002), therefore irrigation can occur 24 hours a day.

Golf Risk Assessment

As a golfer to ensure safety of all site visitors including other golfers and non-golfing general public you adhere strictly to the following:

You are advised to **exercise caution** at all times on the course in respect of identifying areas where there is a potential risk of hitting another golfer or non-golf visitor or being hit by another golfer's errant shot.

Golfers should always be aware that you are at potential risk of being hit by another golfer's ball and to follow the advice by way of cautionary notices that are placed in any areas of higher risk on the course.

Never play a shot unless the players and or non-golf visitors ahead are well out of range.

- If a miss hit shot is heading in the direction of any person you must shout "FORE" in a loud voice to alert persons of the possible danger. If you hear the shout of "FORE" always take evasive acting by facing the opposite direction of the shout and crouch and protect your head with your hands. Never face the direction of the shout to see where an errant golf ball is coming from; and
- Golfers and non-golf visitors should always stand well back and to the side of the player who is playing their shot, both on the tee and on all other areas of the course.

Safety in Design

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The Arm End golf course design and layout has taken into consideration the interaction by golfers and non-golfers. The issue of safety on golf courses can generally be divided into two main areas - internal safety of golfers relative to shots played by other golfers on the golf course - and the safety of persons, property and vehicles on land adjoining the golf course.

Golf Hole Risk Assessment

A Course Risk Assessment prior to course opening will be carried out on a hole-by-hole basis using the following template.

	Significant Hazard	Who might be harmed	How is the risk controlled	Risk Factor
General Overview of Risks				
1	**Typical hazards encountered on a golf course**	Golfers,Greens Staff and spectators	Strict adherance to the Rules and Etiquette of Golf,observe all signs and be aware of rules concerning cessation of play in dangerous weather or conditions.	Low
2	**Teeing Off**	Other golfers on adjacent greens,fairways or paths	Don't tee off until you are sure that the group in front are out of range. Don't tee off if any of your playing partners are standing forward of you Don't tee off if anyone is walking toward the tee from any adjacent holes. Don't stand forward of a player teeing off. Don't walk towards a tee when someone is preparing to drive.	Medium
3	**Miss hit Tee shot to right or left**	Other golfers on adjacent greens,fairways or paths	Pay attention when playing shot and shout fore if ball drifts to left or right and there is any likelihood of hitting someone	Medium
4	**Rights of way**	Members of public and dog walkers on road	Pay attention when playing shot and shout fore if ball drifts to left or right and there is any likelihood of hitting someone.Appropriate holes are 11,12,14,17 and 18.	Medium
5	**Fairway to green**	Other golfers.	Don't take a shot until you are sure that the group in front are out of range. Don't take a shot if your playing partners are forward of you and in range. Stand in a safe position when a playing partner is taking a shot.	Medium
6	**Miss hit approach shot to green**	Players on adjacent holes	Be aware of players in this area and shout fore if hitting to left or right past green and there is any likelihood of hitting someone	Medium
7	**Ponds and deep ditches**	All golfers	Be aware of the dangers of the ponds on the course including slipping down banks,deep water and slippery bridges. Don't step onto frozen water. Use ball retrievers whenever possible. Be aware of the position of lifebelts should they be required. Appropriate holes 6, 11, 14,15	Medium
8	**Hidden Greens**	Other golfers, Greens Staff	Don't play to greens until you are sure that the group in front have left. Greens that may be hidden from view for approach shot are holes 7 and 11	Low
9	**Trees and other fixed hazards**	Golfers and playing partners	When playing near trees beware of balls ricocheting	Medium
10	**Undulating ground,hollows and hills**	All golfers	Take care when walking over undulating ground especially when wet or icy. This affects all holes on the golf course	Medium
11	**Driving Buggies**	All golfers	Take care on hills,hollows and undulations. Take special care driving over bridges or near ditches and ponds. Refer to the Buggy Policy for the Club. Keep speed to a minimum.	Medium
12	**Bunkers**	All golfers	Some bunkers on the course are relatively deep and care should be taken when entering and exiting bunkers. Golfers should also be aware of balls rebounding off the face of the bunker	Low
13	**Winter mats**	All golfers	During the winter months (November to March) winter mats may be in play and golfers should ensure that they have before hitting the ball a good stance which would prevent slipping. On occasions grounds staff will treat the mats with deicing agent to prevent accidents/slipping.	Low
14	**Practice area**	All golfers	Golfers have a restricted area to practice and must not hit a ball knowing that it may go outwith that area. Golfers must also be aware of golfers playing the 3rd.and 4th.holes the adjoining holes on the course.	low

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General Golf Course User Information

It is the responsibility as a golfer, caddie or spectator on the course to ensure that you take note of the following:

- Golf Practising is strictly limited to the Designated Practice Areas of the Arm End site which are:
  - The practice range or practice fairway;
  - Nets and chipping area and the putting Green;
- All visitors (golfers and non-golfers) are advised to use all steps and designated pathways on the course with caution, particularly in wet or frosty conditions;
- It is recommended golf shoes to be worn by golfers on the golf course as they help to avoid slips;
- All golfers are advised to approach all trees, and water features on the course with caution, particularly during windy or other adverse weather conditions;
- Golfers, please follow directional signage for buggies and trolleys as these routes have been developed and introduced for your safety;
- Please also ensure you familiarise yourself with the proper use of golf buggies, this information is provided with each buggy hire;
- Please avoid oral contact with anything that comes into contact with the golf course, particularly when caution signs indicate that chemicals have recently been sprayed on the course;
- In the event that you come across any dead wildlife on the course, please avoid contact and advise the club staff who will then deal with this matter;
- A decision to carry on playing during adverse weather conditions is normally left to the discretion of the player, who MUST accept full responsibility for his/her, safety;
- If the course has not been officially closed, this does not mean that it is necessarily safe to continue play and golfers must determine for themselves, whether they consider it is safe to do so. In such conditions frequent inspections will be made until play is deemed to be safe; and
- The authority to close (and re-open) the course is a management decision but may be delegated to the Club Professional or Head Greenkeeper.

Care must be taken at every hole in accordance with the general points above.

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The Spraying of Chemicals Policy

Management requires staff to use pesticides with a minimalist approach. Less chemicals! More health! For both the soil and the environment. The application of chemicals will be kept to a minimum and be sign posted when used.

No chemicals shall be stored or used on the property without first obtaining the MSDS. Prior to chemicals being used, staff will be given information, instruction, training, as is deemed necessary by supervisors and management to ensure the safety of both the staff and to prevent exposure to the public. During the use, storage and disposal of chemicals staff will be supervised to ensure correct practices are followed. The application of chemicals will be applied with the goal that no drift or runoff and leaching occurs.

Equally, the storage of chemicals should be kept to a sensible minimum. The purchase of unnecessarily large amounts of chemical that will not be used in the current season will be avoided.

All efforts shall be taken to correctly calibrate all spraying equipment to ensure correct rates are applied with the correct techniques; consequently, reducing the overall volume of chemicals applied. All reasonable steps will be taken to use new technology if adaptable to our equipment that may result in lower drift or safer application.

The purchase of new chemical application equipment should always be researched to see if there is a safer or more appropriate option. Staff will be consulted over proposed purchases of chemicals to ensure concerns are openly discussed and addressed by management.

For Public Safety

Spraying will be limited to mornings and days of minimum wind or breeze to minimize and control drift. Procedures will be undertaken that avoids the application of chemicals in the proximity of golfers and the public. These processes will include;

- Informing the Proshop of when the ground crew will be spraying so as to close off an area under influence of spraying to allow application without people being exposed;
- Providing adequate signage, that is visible to the public and indicates that chemical application is in process;
- MSDSs will be made available for viewing by the public if concerns are raised regarding the chemicals being used.

The use of the lowest toxicity chemical option will be preferred. All steps will be taken to carry out our chemical use policies and ensure management's duty of care is applied

All chemical and fertilizer applications will be recorded on operational spraying record sheets.

Records will be stored safely to enable easy retrieval of information when required. This has a twofold objective, with records being kept for retrospective evaluation of operational effectiveness and to ensure operations are meeting their regulatory requirements.

Codes of Practice

The Tasmanian legislation regulating the use of agricultural chemicals is the Agricultural and Veterinary Chemicals (Control of Use) Act 1995 and the regulations under this Act.

The following applies to any person who uses or handles agricultural chemical products.

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The following codes of practice will be adhered to when undertaking the spraying of chemicals on the Arm End site;

- ***Code of practice for Ground Spraying***: https://nre.tas.gov.au/agriculture/agvet-chemicals/codes-of-practice-guidelines-and-information-sheets/codes-of-practice/code-of-practice-for-ground-spraying
- ***Code of practice for spraying in Public Places***: https://nre.tas.gov.au/agriculture/agvet-chemicals/codes-of-practice-guidelines-and-information-sheets/codes-of-practice/code-of-practice-for-spraying-in-public-places

4.10 Signage Plan

A Signage Plan has been completed (Appendix E). The document provides an outline of the proposed approach to a signage plan for the Arm End Public Recreation Reserve.

The approach takes into consideration the following;

- Site location – A peninsula in the River Derwent, with spectacular vistas of Hobart, kunanyi/Mt Wellington, Bruny Island, Storm Bay;
- Natural assets – scenery, coastal flora and grasslands (under rehabilitation), fauna – shorebirds, seabirds, woodland birds, small mammals; marine life (dolphins, whales, spotted handfish);
- Cultural values – Aboriginal land, Gellibrand family European heritage;
- Site use – a multi-use recreation area for golf, walking, riding, wellbeing and bird watching;
- Stakeholders – landowners (PWS), local community, visitors (state, national, international), special interest groups and business investors.

All signs will be located within the boundaries of the leased land. Signs will be maintained in good repair, safe and clean at all times.

4.11 Dog Management

Dog-walking on lead is currently permitted on the *Arm End Public Recreation Area (Gellibrand Point.).*

- *This will not change; it is proposed that the current dog access on lead is continued.*

Dogs are currently prohibited on The Spit area.

- *This will not change; it is proposed that dogs remain prohibited to access The Spit area.*

Dog exercise areas on Shelly Beach from Bangor Road to Icehouse Bluff and on Mitchells Beach are proposed – dogs must be under effective control.

Any new approved dog access will then be formalised in accordance with the National Parks and Reserves Management Regulations 2021.

Signage for dog management/regulation and messaging is provided in Appendix E, once approved by PWS this will be the responsibility of Arm End.

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Arm End Public Recreation Area (Gellibrand Point)

There is a need to protect natural values, flora, fauna and/or areas of cultural significance, on-lead exercise will be allowed for dogs, provided exercise is limited to defined track areas.

Hobart - Eastern Shore	
Arm End Public Recreation Area (Gellibrand Point)	Dog Exercise Areas - On Shelly Beach from Bangor Road to Icehouse Bluff and on Mitchells Beach – dogs must be under effective control. On designated tracks on Arm End – dogs must be on lead at all times. Dogs are prohibited from the Spit area on Arm End

Refer to Appendix U for a map of the proposed designated dog areas at Arm End.

The following dog management messaging will be provided on site with signage outlining procedures and guidelines for dog owners.

Arm End staff will be monitoring and implementing dog management on site in accordance with the proposed management controls.

Consideration of Others

Being a member of the broader community, there are obligations for us all in considering the impact of our actions on others. For the dog owner this includes taking action to:

- Ensure your dog does not bark excessively;
- Clean up after your pet;
- Having dogs on beaches and parks can result in excrement being left behind. In the interest of public health, and the general cleanliness of public places, owners/carers are required to clean up after their dog.
- Purpose built bins on controlled beaches, parks and walkways will be placed to encourage dog owners to "scoop-up" after their dog and dispose of the excrement in a responsible manner.
- Ensuring your dog is under effective control at all times; and
- Not allowing your dog to jump at, or lick others. This might not be accepted by all persons.

Dog Exercise Areas

An area where a dog may be exercised subject to any specified conditions. The two types of exercise areas are:

- On-lead exercise area - A dog can only be exercised on-lead, subject to any restrictions specified.

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- Off-lead exercise area - A dog can be exercised off-lead, subject to any restrictions specified. Dogs must remain within reasonable proximity, sight and be immediately responsive to the controller's command

Dog owners are reminded that when a dog is off lead it must be **under effective control** and in close proximity, within sight and immediately responsive to an owner's commands

Restricted Areas

An area where dogs are restricted from entering during specified days, hours or seasons; or during specified hours, days or seasons unless they are on a lead.

Prohibited Areas

An area containing sensitive habitat for native wildlife.

4.12 Machinery Management

Arm End management, superintendents and staff have a responsibility to ensure that the Arm End Public Recreation Reserve will be managed sustainably and that it is operated in keeping with the local environment.

The operation of Arm End will depend on the use of specialised machinery and in particular mowers, that will produce surfaces that are suitable for golf and use by the public. Mowing will be the most frequent task undertake, with some form undertaken every day, providing conditions (e.g., weather) are suitable.

The maintenance of machinery will focus on ensuring optimal performance as well as minimising impacts to the receiving environment.

4.12.1 Machinery Use

All machinery used will use the dedicated paths to move around the site. Machinery movement on the golf course will be allowed.

Designated 'no go' machinery/vehicles areas will be allocated, demarcated, and signed ensuring the areas identified cultural, geo-conservation and natural values are managed in accordance with the site regulatory approvals. In addition, exclusion zones will be implemented around higher risk cliff areas to manage safety and potential impacts to coastal features.

4.12.2 Vehicle Use

All vehicle use on site for the construction of the project will be outlined in a site induction for all personnel accessing and using the site. Appropriate signage will be used to indicate the required speed limits on site and the use of best practice traffic management guidelines will be undertaken for the construction phase.

Operational vehicle use on site will be managed through the implementation of an employee site induction for the acceptable use of vehicles on site.

- All employees on the site will need to read and sign onto the Safe Work Method Statement (SWMS) for the use of vehicles on site prior to accessing the shared pathways on site.

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The public will be informed via interpretation signage at the entrance of the site and at designated areas along all shared pathways on site. To ensure the safety of all users of the shared pathways the following will occur;

- Arm End will maintain open and ongoing consultation on the shared pathways with all users and other stakeholder groups to keep them informed on magnet requirement and issues.

The vehicle access to the Broadcast Australia lease will utilised the same access path as the pedestrian and cyclist paths, this shared resource will be managed in accordance with the following requirements.

- Broadcast Australia will have 24/7 access to their lease area;
- This access path will be designed and constructed (Class 4 Road) to be used by light vehicles;
- Users will be provided and will need to adhere to the information provided on signage – that will outline this multi-use standards and procedures for use, and outlining the shared use arrangement;
- Ensure speed limits are clearly signed and adhered to on site;
- All vehicles to either use amber flashing lights or hazard light to access the Broadcast Australia lease area;
- All Broadcast Australia personnel using the site and access track to sign in at the entrance, so that the site superintendent/ manager are informed of their presence on site;
- All Broadcast Australia personnel using the site and access track will need to read and sign onto the Safe Work Method Statement (SWMS) for the use of vehicles on site prior to accessing the shared pathways on site.

All vehicle use, outside that which is associated with the Arm End development is prohibited.

4.12.3 Equipment Repair and Maintenance

Arm End will employ a mechanic, their job will be to maintain the fleet of mowers and maintenance equipment in order keep them running efficiently and cutting accurately. The site Superintendent will directly supervise machinery management procedures to ensure repairs and adjustments are made in a timely fashion and in accordance with site approval requirements.

Quality cutting machinery and properly running equipment cannot be overstated. If equipment is not functioning or not running properly maintenance tasks will be delayed or not completed at all, both of which will affect the playability of the golf course and maintenance of the reserve. The quality of cut a mower puts on a grass plant is the first defence against disease and can manage turf stress. If a grass plant is mowed with a dull mower, it will tear the plant opening it up to disease and stress.

Winter Maintenance

Every winter a detailed equipment inspection will be implemented and a master list of parts, needed for repair, will be completed, and ordered as needed. During the autumn when mowing frequencies decrease the mechanics will begin maintenance of the mower cutting units. Bearing and seal replacement will take place if excessive wear or failure in evident. All reels will then be reassembled and put back on the machines. All other accessible equipment will also be inspected and repaired as required.

It is essential that these tasks be completed before the crew reports back to work in the spring, this will ensure mowers and equipment are ready for use when required.

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Regular Maintenance

The following maintenance will apply to Arm End during operations;

- Greens mowers will be checked and adjusted on a daily basis;
- Fairway mowers will be checked and adjusted after each mowing;
- Tee and Approach mowers will be checked and adjusted after each mowing;
- Rotary mowers will be checked weekly and sharpened as needed;
- Oil levels will be checked on all equipment before it is used;
- Oil changes and tune-ups will be performed on all equipment based on manufacturer recommendations, including;

Plant and Equipment

- Surrounds mowers
- Rough mower (WAM)
- Tractors
- Pro Core SR70
- Pro Core 648
- Multi-Pro spray unit
- Sand pro
- Top dresser
- Rollers
- Rotary hoe
- Spreaders
- Edger
- Sod cutter
- Water roller

Maintenance Records

Records of all equipment repairs will be completed by the Mechanics or Superintendent in a file kept in the maintenance building.

Equipment Safety

All purchased equipment and machinery will come with safety guidelines. The Superintendent will ensure that all employees are properly trained in the safety aspects of all equipment.

Original copies of all safety guidelines will be filed in the golf course maintenance shop. The Superintendent will make copies of all safety instructions to be used in training staff. Such training should be noted in each employee's file. Periodic refresher training is also essential.

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Likewise, certain power tools also come with safety instructions. These will be captured in site operation procedures to instruct employees on the safe use of all power tools.

4.12.4 Education and Training

Improving and adequately managing the environment within a public reserve and on the golf course requires an effective education and training program for all staff.

Arm End will ensure staff are adequality trained and that continual improvement drive educational outcomes for our operations.

Staff Training

Training is essential for the proper functioning of the golf course maintenance department. The complexity of turf grass management and the equipment and chemicals used makes it imperative that all employees know the requirements of their jobs, the proper operation of tools and equipment, and the correct use and dangers involved in handling various chemicals. This can only be achieved by thorough initial and ongoing training.

Equipment Training

Much of the equipment used by the golf course maintenance staff is complex, requires daily adjustments, maintenance, and cleaning, and is potentially dangerous if not operated properly.

It is the Superintendent's responsibility to ensure that all employees are properly trained to operate and maintain golf course maintenance equipment. No employee should be allowed to operate a piece of machinery until properly trained and checked out.

The operator's manual that comes with each piece of equipment should be used for such training. Manuals should be kept in the Superintendent's files and copies of all pertinent operation, maintenance, and safety information should be made for distribution to and training of staff.

Chemical Training

The various chemicals commonly used to maintain a golf course require specialized training for proper handling, application, and safety. The consequences of mishandling can range from significant damage to the course to severe illness or death of an employee. The Superintendent will ensure that no employee is allowed to come in contact with any chemical unless required and properly trained in its use and handling.

Environmental Training

All employees will be trained and knowledgeable of all environmental impact areas of the club including the state and federal laws that protect the water quality, as well as environmentally sensitive habitats.

Staff members' work routine will reflect and recognize these restraints, which must be abided by per our environmental impact agreements with these agencies. Disciplinary action will result from ignoring these responsibilities.

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4.12.5 Maintenance Faculty

The maintenance facility has been designed to accommodate machinery and other plant and equipment, provide staff with amenities and have dedicated areas to manage, handle and store chemicals and fuels.

The Arm End maintenance facility will have dedicated areas to mix and store chemicals. It also has specific areas to wash and clean equipment used to apply chemicals. This is vital insurance to manage and control chemicals from leaving the maintenance area confinement and potentially escaping and polluting adjacent soils and receiving waterways.

To ensure adequate containment and ensure management of potential discharges to the surrounding environment are mitigated a commercially built wash station, wash water recycling system, and chemical mix, containment and recovery system will be implemented at Arm End.

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Photo 4 Examples of maintenance facility arrangement

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Washdown Facility

A self-contained washdown bay, with an oil/water separator and holding tank facility will be provided within the maintenance facility. The wash bay set out will include an adequate containment area and holding tank/pit for produced washdown water. The water from the wash will be collected in the gutter provided and will then be pumped out to a holding tank or water treatment unit. Wastewater will initially be treated for onsite re-use in equipment washing, and for other suitable uses around the facility. Any remaining wastewater will be collected, managed, and disposed by a certified wastewater collection company.

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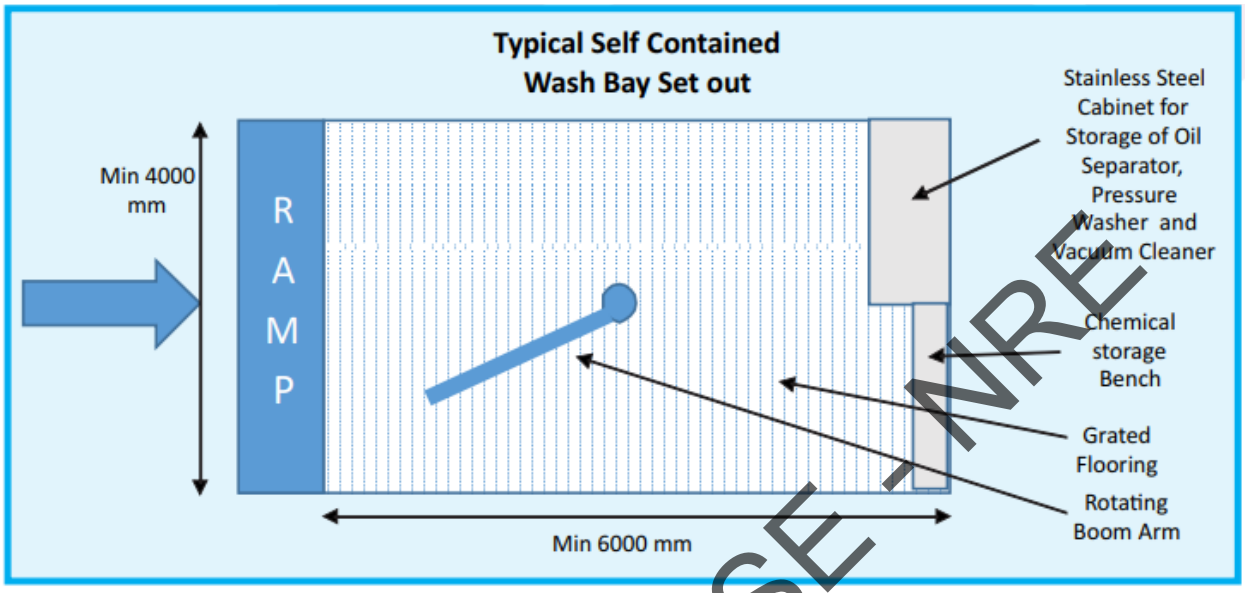
Photo 1 Typical washdown bay with oil/water separator and recycling capability



Nova 1 Self Contained Water Recycling System

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Chemical Applications

Basic fertilizer schedules are to be established based on soil tests to maintain healthy turf and adjusted to meet regulatory approval conditions, environmental and water quality standards.

It will be the policy of Arm End to only apply sufficient fertiliser to allow grass to recover from wear and tear of play/use. Fertilisers will only be applied during the growing season and, where possible, application is timed to avoid heavy rain.

Chemicals will only be used as a last resort and only in a controlled supervised manner under the direction of the Superintendent and supervised/distributed by a licensed applicator. Comprehensive and accurate records of all chemicals used on the course will be kept and maintained.

All personnel responsible for fertilizer or pesticide applications on the golf course will at all times be aware of our environmentally sensitive areas, such as waterbodies, and the proper application of which fertilizer or pesticides must be made per any environmental/approval regulations.

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Pesticide use at Arm End will be part of an overall integrated pest management philosophy and approach. One relevant example of this is the procedure to hand spray adjacent to waterbodies to prevent potential risks of contamination that could arise with boom spraying.

Hazardous Materials

The maintenance facility will have designated storage area for hazardous materials.

It is the responsibility of the Superintendent to ensure that all hazardous materials, to include pesticides, herbicides, fungicides, fertilizers, fuels, lubricants, and solvents are properly stored, handled, and disposed. All chemicals will be stored in designated storage areas, on a hardstand and within a self-bunded arrangement that has the containment capacity of 110% (minimum) of the quantity of chemical (example in Photo 2). Identification signage/labelling will be in place within the maintenance facility, on containers or pipe containing hazardous chemicals.

No employee shall be allowed to work with any of these hazardous substances until they have been properly trained in their use and safety. The Superintendent must keep records to substantiate such training.

Material Safety Data Sheets (MSDS)

It is the policy of Arm End that Material Safety Data Sheets (MSDS) be obtained for all hazardous chemicals brought to site, used in or around managed facilities. Material Safety Data Sheets (MSDS) are provided by manufacturers for any chemical product deemed hazardous.

Appropriate spill kits will be located at;

- All hazardous substances storage units; and
- Refueling and maintenance areas.

Chemical and Fuel storage areas will be inspected weekly.

Any manager or supervisor who purchases chemicals for use in the facility must notify the Safety Officer of any new chemicals purchased. The Safety Officer is charged with the responsibility of obtaining the appropriate MSDSs for any hazardous chemicals used. The MSDSs will be maintained in a master file by the Safety Officer and copies will be made available to all workers and areas or operations using hazardous materials.

All new employees who will work in areas where hazardous materials are used, will be trained how to read and interpret MSDSs.

The Superintendent will ensure that the appropriate MSDSs for all hazardous materials used in the maintenance facility are available for employee review in the work area. Further, the Superintendent will take active steps to ensure periodic review of MSDSs.

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Photo 2 Typical chemical bunding arrangement

Fuel

Only bulk diesel fuel will be stored on site, it will be dispensed from an aboveground tank that has impermeable self bunding included in the design. Other spill containment devices will be implemented where required in compliance with AS 1940. The tank will be situated on concrete hardstand and will be undercover within the maintenance facility. The area will be impervious to the liquid being stored and will have containment that will contain 110% (minimum) of the capacity of the tank. The tank and valves will be appropriately signed and labelled. Adequate lightning will also be supplied. Appropriate spill kits will be available.

During refuelling the following procedure will be implemented;

- Tanks to have an automatic cut off when tank is full;
- The tank must be manual operation only (i.e., operator must depress handle to dispense fuel);
- Suitable sized and types of spill kits will be available next to the tank location;
- A spill tray or other absorbent material will be placed beneath the refueling point;
- Place nozzle in tank and commence filling (do not commence filling until nozzle is place in tank);
- Monitor filling and stop before tanks overflows;
- Undertake spill containment in accordance with the site refueling procedures and guidelines;

In the event of a spill, the procedures as outlined in Section 6.5 - Environmental Incident Reporting will be implemented, most notably the EPA Director must be notified, in accordance with EMPCA, if the release may or has caused serious or material environmental harm.

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Photo 3 Example of aboveground self-bunded fuel tank

4.13 Workplace Health & Safety

Workplace culture is the character of the business. It is the mix of qualities that make up a business and determines how people think, act and work together. It is important for the success of the business and equally important for enabling individuals to thrive.

To ensure guidance and direction is provided to Arm End management and its workers a Workplace Health and Safety Policy manual has been documented (Appendix J). The document will help Arm End in achieving the commitments to the workplace and our environment

We seek the co-operation and active engagement of all workers, land managers, regulators and other persons who may be affected by our operations, in helping to create a safe and healthy workplace and Public Recreation Reserve.

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5. Environmental Management Framework

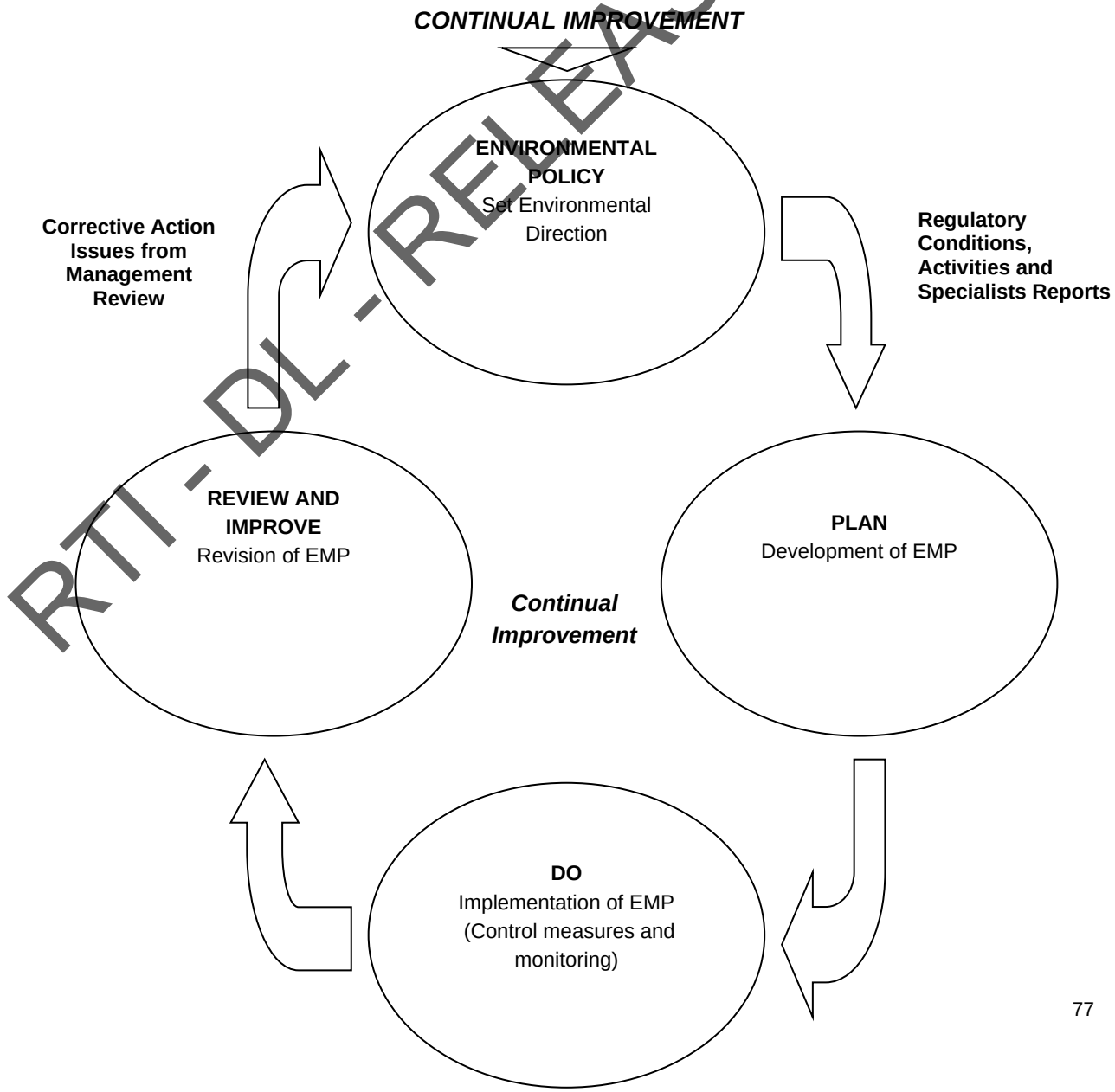
5.1 Environmental Management Process

The regulatory approvals and environmental impact assessment process identified the most significant and relevant aspects of the environment to be managed and determined the most effective control measures required to achieve the environmental objectives. The approval conditions and the subsequent specialist reports provided most of the information necessary to prepare this EMP.

This EMP must be used as a dynamic document that is reviewed regularly and be flexible enough to enable and facilitate the introduction and adoption of new strategies for improvement of environmental management performance and compliance with approval conditions.

This EMP will be managed under the structure of the Arm End Project Environmental Management Systems (EMS) ensuring all commitments and approval conditions are efficiently achieved and distributed across the Arm End project & construction team and that continual improvement drives the fundamental environmental objectives for the project. Figure 2 below highlights this process.

Photo 1 ENVIRONMENTAL MANAGEMENT PROCESS



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5.2 Objectives

The objectives of this EMP are to ensure that:

- The Arm End team commits to implementing adequate control measures to manage environmental values throughout the design, construction and operational phases of the Arm End project;
- Environmental responsibilities, monitoring, reporting and auditing procedures are established and demonstrate due diligence;
- Environmental management is appropriately planned, implemented and maintained throughout the project;
- Environmental management is included in the project risk management process;
- The principles of Best Practice Environmental Management (BEMP) feature throughout the works of the project; and
- Any potential environmental impacts of the project works are managed in accordance with legislative requirements, the project permit conditions and site procedures.
- All potential environmental impacts associated with this Project can be effectively controlled by the implementation of the mitigation and management procedures described in this EMP.
- The EMP will be updated at regular intervals to capture the most current and applicable information on the activities and impacts relevant to that stage in the Project.

5.3 Legislative Requirements

The primary environmental protection and pollution control legislative obligation for the development is the Tasmanian Environmental Management and Pollution Control Act (EMPCA). Tasmania enacts the requirements under EMPCA through a suite of legislation which forms the framework for Tasmania's resource management and planning systems and includes the following:

- *Land Use Planning and Approvals Act 1993;*
- *Building Act 2000;*
- *Environmental Management and Pollution Control Act 1994;*
- *Resource Planning and Development Commission Act 1997;*
- *Resource Management and Planning Appeal Tribunal Act 1993;*
- *State Policies and Projects Act 1993;*
- *Aboriginal Heritage and Relics Act 1975;*
- *Historic Cultural Heritage Act 1995; and*
- *Major Infrastructure Development Approvals Act 1999.*

Under the State Policies and Projects Act 1993 there has been four (4), State Polices developed including:

- *Tasmanian Coastal Policy 1996;*

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- *State Policy on the Protection of Agricultural Land 2009;*
- *State Policy on Water Quality Management 1997; and*
- *National Environment Protection Measures (NEPM).*

Further legislative requirements for the Visitor Centre development include the following:

- *The Tasmanian "Threatened Species Protection Act"1995*
- *The Tasmanian "Weed Management Act" 1999*
- *The Commonwealth "Environmental Protection and Biodiversity Act"1999*
- *Work Health and Safety Act 2012;*
- *Dangerous Goods (Road and Rail Transport) Act 2010; and*
- *Maritime Transport Security Act 2003.*

5.4 Approval Requirements

The approval requirements for the project are contained in the following;

- Planning Permit (D-2015/235) - Clarence City Council;
- Reserve Activity Assessment (RAA) –Tasmania Parks & Wildlife Service;
- Aboriginal Heritage Permit No. P71; and
- Crown Lease – Tasmania Government.

All approval requirements are defined in Section 2, which highlights the required management controls for each environmental/heritage issue relevant to the Arm End project site.

5.5 Organisational Structure and Responsibility

The overall responsibility for environmental compliance sits with the proponent, Mary Ann's Island Pty Ltd; however, the entire Arm End Project Team will implement all relevant site procedures and be responsible for the environmental performance of all their activities and for complying with this EMP.

The competency and training of all the Arm End team involved in the Project will ensure that individuals are aware of their environmental responsibilities.

Any sub-contractors engaged for the Project will be responsible for environmental management through the agreed conditions of their contract.

The responsibilities of the key stakeholders are detailed in Table 2.

Table 2 Project Roles and Responsibilities

Role	Responsibility
Local Council Authority Clarence City Council	• Convey to the project developer and project manager any inquiries received, from adjoining residents and local community groups, that concern the project;

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	• Promptly assess any proposed changes to the project and its implementation that may be requested by the proponent construction contractor and project manager; and • Liaise with the proponent and project manager, construction contractor and its representatives to ensure that the development is carried out in accordance with approved conditions; • Promptly respond to any request from the Arm End PD/PM for advice concerning appropriate responses to any environmental incidents with the potential to cause environmental harm; • Promptly assess any proposed changes to the Project and its implementation that may be requested by the PD/PM; and • Liaise with the Arm End PD/PM to ensure that the development is carried out in accordance with all approval conditions and commitment.
Government Authority Parks & Wildlife Service/Property Services & EPA	• Promptly respond to any request from the project construction contractor for advice concerning appropriate responses to any environmental incidents with the potential to cause environmental harm; and • Liaise with the project developers and project managers to ensure that the project is completed in accordance with all approval conditions and commitments
Arm End Project Director/ Project Manager	• Overall project management including implementation of the above approved documents; • Liaise with the Arm End Project Team during construction to ensure works are being implemented in accordance with the EMP; • Be the principal contact for receiving enquiries concerning project activities; • Works planning, coordination, financial and program management; • Coordinate with specialist (where required) for the review of documents for implementation within the Arm End Project; • Arrange for pre-start meetings prior to the commencement of construction activities associated the project; • Provide technical advice to the Arm End Team as required; • Coordinate works procedures for the Arm End Team.
Arm End Team Members Crafter+Mogford Golf Course Architects & Project Principal Contractors	• Conduct all works and operations in accordance with this EMP; • Implement training for project personnel in accordance with this EMP; • Complete site inspections as required; • Comply with workplace health and safety legislation and standards. Promptly advise the Project Director of any conflict between the requirements of this EMP and workplace health and safety legislation and standards; • Attend pre-start meetings and periodic site inspections during construction or as triggered by any environmental events and incidents from the commencement of the contract until the completion of the contract works; • Notify the Arm End Project Director regarding environmental incidents with potential to cause environmental harm or nuisance as soon as practicable and provide written details within a timely manner of occurrence including details of corrective actions taken; and • Ensure sub-contractors carry out contract duties in accordance with this EMP.

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	• Ensure all work sites are secured from general access; • Notify the Arm End project Director regarding EMP performance and monitoring, non-compliance and actions taken, and seek advice when required.
Sub-Contractors	• Perform contract obligations in accordance with this EMP and all other relative legislation.

The Arm End Project Director (PD) or delegate, will monitor and review the activities of the Arm End Team contractors and sub-contractors to ensure conformance with the requirements of the EMP. This will in no way relieve contractors and sub-contractors from the appropriate supervision of their employees in the implementation of the EMP, and any subsequent responsibilities for the remediation and/or rehabilitation of any damage which might be caused.

5.6 Environmental Policy

The Arm End team understands that managing and mitigating any potential environmental impacts is a key driver in achieving sustainable development outcomes for the Project, Mary Ann's Island Pty Ltd Board, regulatory authorities and all stakeholders.

The Arm End team has developed an Environmental Policy founded on industry best practice, and in conjunction with the Arm End environmental policy objectives. This Environmental Policy will be displayed and communicated to staff and other involved stakeholders via inductions and awareness and training initiatives.

This EMP provides the means for which to achieve these environmental policy objectives and to comply with the Arm End Environmental Policy.

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Photo 2 Environmental Policy

Arm End Public Recreational Reserve

ENVIRONMENTAL POLICY

The Arm End Project, is committed to:

- Conducting works for the Arm End Project in a manner consistent with environmentally sustainable development;
- Operating all project activities in compliance with the conditions outlined by the Regulatory Authorities;
- Ensuring employees and contractors are informed, competent, and trained to implement the control measures for routine operations and emergencies to minimise the likelihood of environmental harm/nuisance;
- Providing leadership and adequate resources to effectively implement the Environmental Management Plan
- Achieving best practice environmental management;
- Monitoring and auditing the performance of the Environmental Management Plan;
- Ensuring that project works are managed in the public interest and that other relevant stakeholders, Arm End users, visitors and the public are informed on all matters concerned with safety, health and environmental aspects; and
- Achieving compliance with all relevant Workplace Health and Safety requirements.

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6. Environmental Diligence

6.1 Environmental Induction and Training

All contractors, consultants, sub-contractors and project personnel will receive a site induction into the requirements of this EMP, prior to starting work on this Project. The induction will be appropriate to the level of their involvement in the Project.

Site inductions will be developed to induct personnel into the broad aspects of the Project. The environmental component of this induction will reinforce that it is the responsibility of all personnel to adhere to all identified environmental requirements and site procedures. The Project Director (PD) or delegate shall provide a site induction for attendance by all contractors and project personnel. The induction training will cover, but not be limited to, the following issues:

- A general site overview and SWMS/JSEA's;
- Work site safety;
- Contractor site policies.
- Project environmental responsibilities;
- Environmental activities, aspects and impacts;
- Familiarisation with the requirements of this EMP;
- Legal obligations; and
- Environmental emergency/incident reporting.

Environmental training shall be re-undertaken when changes to procedures and environmental conditions occur.

A register of all environmental training carried out including dates, names of persons trained, and trainer details will be kept and maintained.

6.2 Monitoring

Monitoring of the implementation of the EMP is necessary to ensure that management control measures and procedures are meeting all the conditions and commitments approved and are being implemented in an effective manner.

The Project Manager is responsible for monitoring environmental performance and condition throughout all stages of the project.

Site monitoring of the EMP will:

- Verify contractors' implementation of control measures and to provide management feedback for the initiation of further controls if required; and
- Provide data for ongoing environmental management.

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6.3 Environmental Quality Controls

This project shall be subject to inspections to verify that construction works is compliant against all relevant criteria. Any pertinent findings obtained from the inspections will be actioned through the applicable management process.

The Project Manager or delegate may undertake audits, to verify that management systems and processes designed to minimise and manage environmental impact have been implemented diligently, are functioning efficiently and can be used to identify where improvements can be made.

6.3.1 Site Contacts

Prior to the commencement of any works associated with the project, information detailing the project team must be distributed to all relevant stakeholders.

The document must detail the relevant project participants for the works being undertaken on the site, including the contact details for Project Manager to which any inquiries concerning the project should be directed.

6.4 Non – Compliance

Compliance with this EMP is the responsibility of the Project Manager in coordination with the Construction Contractor, where necessary specialist independent advice will be sought.

Where any activity is found not to conform to the requirements of the EMP, activities will be suspended until appropriate measures are in place and agreed with by all relevant stakeholders and authorities.

6.4.1 Corrective Action Requirements

The Project Manager must take responsibility for implementation of this EMP. When the Project Manager becomes aware of a project condition that does not comply, applicable communication is to be completed and reported to the appropriate controlling authority.

The Project Manager or delegate is also required to maintain a register which demonstrates appropriate actions have been completed within a suitable timeframe.

Any actions or communications recorded in accordance with this EMP shall be recorded and stored by the Project Manager.

In some circumstances, supplementary investigations or monitoring may be required to establish whether the Construction Contractor and/or Operational Team has failed to adequately implement the EMP or has failed to comply with relevant legislation and operational procedures.

6.4.2 Incident Response

If an incident causing or threatening environmental nuisance, environmental harm or material environmental harm from pollution occurs during the project, the person responsible for the activity must immediately take all responsible and practical action to minimise any adverse environmental impacts from the incident.

All Environmental Spills should be managed in accordance with the controls in this EMP.

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6.5 Environmental Incident Reporting

In an emergency and/or incident the person responsible must immediately notify the appropriate Authorities (EPA, PWS and CCC) so as they become aware of the emergency or incident resulting in a release of contaminants not in accordance, or reasonably expected to be in accordance with this EMP (and conditions of approval).

The notification of any emergency or incident must include, but not limited to the following information:

- The name of the holder of the development approval;
- The location of the emergency or incident;
- The name and contact details of the project manager, or designated contact person;
- The time of the release;
- The time the operator became aware of the release;
- The suspected cause of the release;
- The environmental harm caused, threatened, or suspected to be caused by the release; and
- Actions taken to prevent any additional release and mitigation measures implemented to manage environmental harm.

All incidents must be recorded.

The EPA Director must be notified, in accordance with EMPCA, if the release may or has caused serious or material environmental harm.

CONTACT

EPA Director – 1800 005 171.

6.6 EMP Review

This EMP is a living document. Accordingly, to ensure that environmental management is continually improved during the project, a review of this document by the Project Manager or delegate, in consultation with relevant stakeholders shall occur:

- To incorporate any changed condition requirements or commitments different to current approval;
- Following significant environmental incidents; and
- In the instance whereby the objectives of this EMP are not being achieved.

The adequacy and effectiveness of this EMP shall be reviewed regularly during the project following the guidelines for continual improvement. The review should consider the following matters:

- Suitability and proficiency of the objectives;
- Inspection's findings; and
- Technical reviews.

This EMP must not be implemented or amended in a way that contravenes any approval conditions or commitments.

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6.7 Reporting

An environmental performance procedure will be implemented to capture environmental performance against the EMP and relevant approval and legislative requirements. Regular project meetings will also occur, where environmental compliance will be discussed, and provisions made to manage and respond to any actual or potential environmental events.

6.8 Continual Improvement

All personnel involved in the project shall receive environmental awareness training with regard to the requirements of this EMP and all other relevant procedures and legislative requirements.

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7. Environmental Management Program

The following environmental management procedures apply to the environmental issues relevant to the site. The procedures aim to provide criteria and indicators to measure the environmental performance, as well as mitigation controls to reduce potential impacts;

- Stakeholder Communication;
- Construction Management;
- Operational Management;
- Design & Construction
- Natural Values;
- Cultural Heritage (Aboriginal & European);
- Erosion and Sediment Control;
- Hazardous Materials;
- Waste Management;
- Noise Emissions;
- Air Quality; and
- Traffic Management.

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7.1 Stakeholder Communication

Rational

Construction and operational activities could potentially have short term impacts on public amenity due to potential environmental nuisance; therefore, it is important to advise the local community and key stakeholders of potential impacts.

Objective

Undertake all reasonable measures to notify the local community and key stakeholders of the nature, duration and program of construction works and operations.

This will include:

- Providing all stakeholders with up-to-date and timely information to enable timely decision making;
- Creating and maintaining a platform of understanding between all stakeholders to ensure potentially disruptive construction activities are communicated in a timely manner; and
- Undertaking appropriate communication and engagement activities with stakeholders to ensure they are engaged through the construction process.

Performance Indicator

Appropriate management of community complaints received during construction works and operations.

The content of communications will aim to provide transparent and timely information to stakeholders and community members about any expected impacts and the proposed mitigation measures. Supporting messages will be developed for specific construction phases and operational activities.

Tasks	Corrective Actions/Monitoring	Timing	Responsibility
Development of a communication plans for liaising with government/regulatory agencies and other relevant key stakeholders	Consultation and communication with external bodies including government agencies, local councils and other affected stakeholders will be undertaken in	Communications Plan to be approved by PWS	Project Manager

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(RAA – C5)	accordance with the documented Communication Plan. (Refer to Appendix I for a copy of the Communication Plan)	prior to works commencing	
Advise local community of project details	Communication of the project details relevant to the local community will be undertaken via meetings, site briefings, pre-commencement brochure and social media with key residential addresses adjacent to the proposed works.	Ongoing	Operations Superintendent
Provide a point of contact for complaints. The contact details shall be clearly identified on all documentation communicated to the local community.	Corrective actions shall be undertaken as appropriate to ensure the task is achieved.	Ongoing	Operations Superintendent
Change in responsibly of project	Key Stakeholders must be notified if the person who is or was responsible for the activity ceases to be responsible for the activity.	Ongoing	Project Manager

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7.2 Construction Management

Rational

The project works will involve construction activities adjacent the marine environment and next to terrestrial watercourses. Unless appropriate management is implemented the works have the potential to cause short term impacts on the receiving environment.

Objective

Implement management control measures to minimise the risk of disturbance to receiving environment.

Performance Indicator

The adjacent aquatic environment will be monitored during construction works to confirm minimal impacts from the work activities.

Tasks	Corrective Actions/Monitoring	Timing	Responsibility
Construction activities	All construction works must be undertaken in accordance with the Wetlands and Waterways Works Manual (DPIPWE) and Soil and Water Management on Large Building and Construction Sites (Derwent Estuary Program & others). Please refer to the following for a reference copy: **Wetlands and Waterways Works Manual** https://epa.tas.gov.au/epa/water/stormwater/soil-and-water-management-on-building-sites **Soil and Water Management on Large Building and Construction Sites** https://dpipwe.tas.gov.au/conservation/flora-of-tasmania/tasmanias-wetlands/wetlands-waterways-works-manual	Prior to commencement of construction works and during project works For all construction works	Project Manager & Construction Contractor Project Manager & Construction Contractor

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	The contractor is to implement and maintain erosion and sediment control measures for the duration on the works in accordance with; • the above referenced manuals • Section 7.7 of the EMP; • the Car Park and Access IFC drawing C-02-04-01 in Appendix N; and • the Landscape Master Plan drawing LMP05 in Appendix D. These measures are to be provided to the project manager prior to installation for comment and subsequent approval. Ensure geo fabric silt fences are established during the works to control the potential for turbidity occurring in the adjacent marine environment.	For all construction works	Construction Contractor
Exclusion Zones	During the construction works 'No Go' exclusion zones will be implemented to manage any potential impact to cultural heritage on site. All cultural heritage areas identified through regulatory approvals will be demarcated with fencing and adequately signed. These exclusion zones will be identified and outlined to the Principal Contractor on site (refer to Appendix B - for the Arm End Master Plan that outlines the cultural heritage areas on site). This information will additionally be communicated via site inductions for all contractors working on site. All machinery used will use the dedicated paths to move around the site. Machinery movement on the golf course will be allowed. Designated no machinery/vehicles areas will be allocated, demarcated, and signed ensuring the areas identified cultural, geo-conservation and natural values are managed in accordance with the site regulatory approvals.	For all construction works	Project Manager & Construction Contractor

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	All identified Cultural Heritage sites will be demarcated on site and regularly (monthly) monitored to ensure they are adequately managed and preserved. This monitoring program will be reported to regulatory authorities (PWS & CCC).		
Water quality management during construction works	Conduct visual monitoring of construction activities so that any potential disturbance to adjacent marine water is identified and construction works ceased until turbidity issues have dissipated.	During construction works	Construction Contractor & Project Manager
All plant & equipment	All plant and equipment used for the project must be maintained such that no contaminants are released to the receiving environment Leaks from plant and equipment must be repaired immediately.	Ongoing	Construction Contractor
Construction activities - eagle management **(RAA – C6)**	An assessment of potential raptor nest records has been completed at the Arm End site. There were no recorded sightings of active nests. Accordingly, as there are no nests at the site the 1km 'no works' buffer around the nest is not required (Refer to Appendix M for a copy of the report).	Prior to commencement of construction works at Arm End	Project Manager
Water Storage Tanks installation **(RAA – 21)**	These features are components of the development of a multi-use public recreation reserve across the project Area but themselves are restricted to a small area immediately to the north of the cul de sac at the termination of Spitfarm Road. In earlier design phases the water tanks were to be placed above the existing ground surface but it has become necessary, due to engineering constraints and safety of the structures, to excavate a shallow layer of the ground surface beneath the pads supporting these tanks.	Prior to installation of water storage tanks	Construction Contractor & Project Manager

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	As a result of this, Aboriginal Heritage Tasmania (AHT) and the Tasmanian Parks and Wildlife Service (PWS) required the project to provide specialist Aboriginal heritage management advice containing a rationale for the departure from Condition 21 of the Reserve Activity Assessment (RAA3297), which specifies that the excavation of the ground surface at the site of the water tanks is to be avoided.		
Vegetation Management **(CCC - C4 & C12)**	Tree Root Protection Zones must be established around identified trees and maintained during construction works in accordance with AS 4970-2009 to exclude: – Storing of building materials, – Vehicular traffic, – Placement of fill; and – Excavation works. No changes to topography or removal, destruction, felling, lopping, ringbarking oof tress other than in accordance with the approved plans without written approval.	During construction works	Project Manager & Construction Contractor
Vegetation Management **(CCC - C12)**	The removal of vegetation as part of the works and protection of retained native vegetation will be undertaken as follows; • Vegetation removal will be limited to the footprint necessary for works activity, infrastructure protection and public safety; and • Vegetation will not be disturbed outside the construction areas, access tracks or phases of works without approval from PWS and CCC. Native vegetation that is to remain, will be identified as 'exclusion zones',- these areas will be demarcated with fencing and adequately signed.	During construction works	Project Manager & Construction Contractor

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	These exclusion zones will be identified and outlined to the Principal Contractor on site (refer to Appendix D - for the Landscape Management Plan that outlined what native vegetation will remain). This information will additionally be communicated via site inductions for all contractors working on site.		
Hot Works Management	In the event of an extreme/catastrophic fire danger or a Total Fire Ban. Arm End construction works will take a common-sense approach to eliminating any chance of starting and or causing fire. The following procedures will be implemented: • No machinery will be used; • No grinding will occur; • No smoking; • Refrain from any activity that may cause sparks e.g., grading of roads/paths etc.; • No filling of plant and equipment with any type of fuels; and • Monitoring of the site will be undertaken during such an event to manage any potential fire arising	During construction works	Project Manager & Construction Contractor
Entry & Exit pits for HDD works ***(RAA – C18)***	All entry and exit pits need to be located at a minimum of 15m from identified Aboriginal heritage sites.	Throughout the construction works	Construction Contractor & Project Manager

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Hygiene Protocols Construction Activities – Weed & Disease Control ***(CCC – C2 & C13)***	Hygiene Protocols for all Construction Activities to manage weed and disease control, must include a dedicated hygiene and washdown point or station. This control item must be established prior to works commencing. All machinery to be used for the construction works and operations are to follow the Tasmanian Wash-Down Guidelines for weed and disease control**.** (Refer to Appendix W) The Weed Management & Revegetation Plan for the Arm End Recreational Reserve should also be used in the management of spreading weeds and pathogens. (Refer to Appendix C – particularly the section on Hygiene Protocols)	Prior to the commencement of works	Project Manager & Construction Contractor
Stockpiles of soil generated from civil works	All material to be re-used on site must be stockpiled on-site, in a designated area outlined by the project manager. Generally, stockpiles must adhere to the following; • be maintained effectively so that materials are well sorted, separated and easily accessed for future use; • Drainage is to be directed away from stockpiles; • Stockpiles to be no greater than 1m in height; and • Upstream face of the stockpile shall be silt fenced to prevent overland flow eroding stockpile toes. Any materials that are not to be reused on site must be managed in accordance with the guidelines outlined in Information Bulletin No.105 (EPA Tasmania).	For all construction works	Construction Contractor & Project Manager

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Use of imported fill	Any construction works that requires the use of imported fill material must use a registered quarry. Documentation for the fill material must be filed and keep as confirmation that the fill material has been purchased from a registered quarry and that it is free of weeds and pathogens.	For all construction works	Project Manager & Construction Contractor
Demolition of existing infrastructure	Any existing infrastructure within the development footprint that needs to be demolished and disposed of or re-used in accordance with the Environmental Management & Pollution Control Act, 1994 - (http://epa.tas.gov.au/regulation/waste-management).	For all demolition works	Project Manager & Construction Contractor
Competent personnel	The principal contractor must ensure all workers are appropriately qualified, inducted and follow all appropriate control measures to minimise the potential risks associated with the project. Ensure the requirements of the CEMP and regulatory environmental procedures are adhered to throughout the duration of the project works. Ensure that all employees associated with the project adhere to the Safe Work Method Statement and/or JSEA's and the site induction procedures to ensure that adverse environmental impacts are minimised.	Ongoing during the project works	Construction Contractor & Project Manager

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7.3 Operational Management

Rational

Operational works will involve maintenance activities adjacent the marine environment and on the terrestrial land. Unless appropriate management is implemented the works have the potential to cause short term impacts on the receiving environment.

Objective

Implement management control measures to minimise the risk of disturbance to receiving environment.

Performance Indicator

The adjacent aquatic environment will be monitored during operation works to confirm minimal impacts from the work activities.

Tasks	Corrective Actions/Monitoring	Timing	Responsibility
Operational Hours	The operation of the site will revolve around the hours required for the management and maintenance of the nature recreational component (shared pathways/tracks), weed management, revegetation, rehabilitation and golf course. The hours of maintenance will vary throughout the year in accordance with the seasons. There will be situations when operations will need to commence early in the morning (4am-6am) when applications of fertiliser are applied. There will also be times when operational personnel will be required to stay later in the evening. (evening spraying, watering in product etc) More specifically; Summer starting times will be generally 6am and Winter starting times will be generally 7-7.30am. Public access is required to be 24/7 in accordance with our lease agreement with the State Government.	For project works during operations	Operations Superintendent

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Café	The Café and Pro-Shop will implement the following opening times; Open – 6.00am daily Close - 10.30pm daily	During Operations	Operations Superintendent
Maintenance activities	All construction works must be undertaken in accordance with the Wetlands and Waterways Works Manual (DPIPWE) and Soil and Water Management on Large Building and Construction Sites (Derwent Estuary Program & others). Please refer to the following for a reference copy: **Wetlands and Waterways Works Manual** https://epa.tas.gov.au/epa/water/stormwater/soil-and-water-management-on-building-sites **Soil and Water Management on Large Building and Construction Sites** https://dpipwe.tas.gov.au/conservation/flora-of-tasmania/tasmanias-wetlands/wetlands-waterways-works-manual The works are to implement and maintain erosion and sediment control measures for the duration on the works in accordance with the above referenced manuals and as outlined in Section 7.7	For project works during operations	Operations Superintendent & Construction Contractor
Emergency, Evacuation & Bushfire Management **(RAA – C8)**	Arm End readily acknowledges and accepts it's moral and legal responsibilities to Health, Safety and Environment. Arm End is committed to emergency, bushfire and evacuation management. Consequently, the following documents have been compiled to manage our obligations; • **Emergency Response Plan** - designed to provide guidance on how to manage the occurrence of specific emergencies that may occur. (Refer to Appendix F) • **Bushfire Hazard Management Plan** - to confirm the suitability of the Arm End site to be successfully further developed for the future vulnerable use in	Ongoing	Operations Superintendent

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	accordance with the Clarence Interim Planning Scheme and the Building Regulations (Refer to Appendix G). • **Bushfire Emergency Plan** – which outline procedures for occupants and site management to follow in the event of a bushfire emergency (Refer to Appendix H). **Management of Hot Works** In the event of an extreme/catastrophic fire danger or a Total Fire Ban. Arm End operations will take a common-sense approach to eliminating any chance of starting and or causing fire. The following operational procedures will be implemented: • No mowing will occur; • No brushcutting will be undertaken; • No grinding in the workshop (includes grinding of mower reels); • No smoking; • Refrain from any activity that may cause sparks e.g., grading of roads/paths etc.; • No filling of mowers/jerry cans with any type of fuels; and Monitoring of the site will be undertaken during such an event to manage any potential fire arising		
Safety Management **(RAA – C12)**	A Workplace Health & Safety Policy Manual has been developed and will be implemented to ensure that all staff, customer and public requirements are satisfied and is applicable to all activities undertaken by Arm End. (Refer to Appendix J for the Workplace Health & Safety Policy Manual)	Ongoing	Operations Superintendent

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Dog Access **(RAA – C9)**	The management of access for Dogs on Arm End is discussed in more detail in Section 4.11	Ongoing	Operations Superintendent
Machinery Management **(RAA – C12)**	Machinery management on Arm End is discussed in more detail in Section 4.12 All machinery used will use the dedicated paths to move around the site. Machinery movement on the golf course will be allowed. Designated no machinery/vehicles areas will be allocated, demarcated, and signed ensuring the areas identified cultural, geo-conservation and natural values are managed in accordance with the site regulatory approvals.	Ongoing	Operations Superintendent
Landscaping & Revegetation Plan **(CCC - C16 & C20)**	A Landscape Master Plan has been completed for Arm End. The plan provides a master plan for the site planting schedule requirements, while also providing detail for the screening planting for the maintenance facility and car park (Refer to Appendix D for the Landscape Master Plan). Revegetation and landscape planting will be undertaken (where practical) during late autumn - winter to maximise survival rates. Watering plants in at the time of planting and adding native fertiliser will be implemented. Appropriate weed mating and/or mulching will be implemented to help retain moisture and retard weed growth. New plantings will be protected using either tree guards, socks of through fencing (where practical and approved). Monitoring of these plant protection mechanism will be undertaken as part of the maintenance schedule (outlined below), so that all new plantings are managed for success of the revegetation programme. After	Ongoing during operations & construction Ongoing during operations & construction	Operations Superintendent & Project Manager Operations Superintendent & Project Manager

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	3-5 years some protections may be able to be removed depending on how well the pants have established. Biannual monitoring of the plantings will be undertaken to ensure the success of the revegetation on site. This will be undertaken for an initial 2 years to monitor planting success. Annual maintenance will be undertaken and will include maintaining protection of plants, watering, replacement of dead plants and weed control. To assess the success of the revegetation program progress reports will be documented and provided to key stakeholders (CCC and PWS) on an annual basis for years 1-3 and then biannually until year 10 (from commencement of revegetation works). The reports will quantify; • The extent of revegetation works undertaken; • Assess their effectiveness; and • Provide suggested changes to methodologies, species mix, or timing of plants based on the results. This approach will ensure continuous improvement occurs on site so that the most effective and long-lasting outcomes can be achieved.		
Maintenance of Landscape Areas **(CCC - C20)**	The maintenance of landscape/rehabilitation areas for Arm End is a key work item for the site. To ensure these areas are maintained and managed accordingly 25% of the full-time workforce (5 full-time staff) employed will be tasked with managing landscaping, revegetation, walking paths and maintaining signage - this percentage will increase during selected times of the year (Autumn/Winter when less mowing is required on the golf course and surrounding areas). Qualified horticulturists will be employed to manage the landscaping and revegetation works and maintenance of these areas.	Ongoing during operations & construction	Operations Superintendent & Project Manager

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	Monitoring through a maintenance schedule will be implemented using “Golf Course” software which details and documents designated job hours, tasks, outcomes and recommendations per work item for reporting to the Operations Superintendent. This includes daily, weekly and monthly reporting and monitoring requirements over a per annum work cycle. Internal audits will be completed by the Operations Superintendent (or representative) on a weekly basis and then fed into a monthly report that will be discussed and reviewed at scheduled (monthly) employee workshops. An annual maintenance manual will be documented and implemented for Arm End. This manual will capture the required maintenance schedules outlined above and will ensure Arm End meet required maintenance standards to support the sites vision and to provide the community with the best possible recreational and golf course facility. The maintenance and monitoring of the shared walking paths and interpretive signage will be included in the revegetation program progress reports (mentioned above). Arm End will operate and maintain assets to provide an adequate and defined level of service, within budget limitations. A current infrastructure and works risk register will be implemented to manage and maintain an appropriate level of risk and to improve maintenance outcomes. A review of current and required resources and skills vital to the maintenance of site works will be undertaken. Where additional workforce training and development is needed, this will be rolled out to meet required operations and management outcomes.		

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Weed Management in Sensitive Areas **(CCC – C14)**	Discussions with CCC and PWS have occurred in terms of applying the use of alternative heavy machinery methods to remove large infestations of African boxthorn. To reflect these discussion and recommendations from regulatory authorities, the following procedures will be implemented when undertaking weed management works adjacent to and in sensitives areas; • Weed removal works within Aboriginal heritage sites will be cut and paste only, with no ground disturbance (as per P71). Piles of removed weeds, will be located outside Aboriginal heritage sites to avoid impacts. • Weed removal works within the Spit – Bird Sanctuary area and other sensitive foreshore areas will be cut and paste only, with only limit ground disturbance allowed (between shorebird breeding season – being September to April). This includes defining one access track (in & out) to recover weeds material that will need removal from these areas. Piles of removed weeds, need to be located outside these areas to avoid impacts. • Machinery will be excluded from Aboriginal/Cultural heritage sites to avoid impact. Exclusion zones, with temporary fencing around Aboriginal/Cultural heritage sites will be implemented. • Selective weed removal is proposed for large weed plants to ensure habitat values are maintained and manage potential erosion issues; • Burning of piles of weeds on site requires written approval from PWS and CCC, in addition liaising with the Tasmania Fire Service is required to ensure correct notification and permitting is undertaken; • Arm End is responsible for the safe conduct of the pile burns, including the safety of visitors in the nearby area. It is Arm End responsibility to ensure a Job Safety Analysis and/or Safe Work Method Statement is undertaken or similar work procedures are in place to ensure the safety of workers and the	Ongoing during operations & construction	Operations Superintendent & Project Manager

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	public, and that staff undertaking the works are appropriately qualified and resourced; • Notification of the pile burns to adjoining residents will be undertaken in order to avoid unnecessary concerns being raised with the TFS and/or PWS/CCC. Depending on location, scale and smoke, the possible need to liaise with MAST if navigation marks become obscured will also be considered. • Contact with the Seven Mile Beach Field Centre:(sevenmileops@parks.tas.gov.au 6107 9208) and CCC representative will occur if any proposed burn is moved to an alternative date, and confirmation will occur with the Field Centre, CCC and TFS once the burn is completed and extinguished.		
Accumulated vegetation or similar **(CCC – C14)**	Management of accumulated vegetation must be controlled by; • Chipping/mulching for removal or reuse on site; or • Removal from site to a location approved by CCC - Senior Environmental Health Officer (prior to removal); or • Taken to a waste management facility license to take such material (receipt to be retained as proof of disposal location); or • Other method approved in writing by CCC - Senior Environmental Health Officer. No on site burning unless approved in writing by CCC - Senior Environmental Health Officer (any approved burring will not be within 500m of a habitable building).	Ongoing during operations	Operations Superintendent

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Spraying of Chemicals	The following applies to any person who uses or handles agricultural chemical products. The following codes of practice will be adhered to when undertaking the spraying of chemicals on the Arm End site; • ***Code of practice for Ground Spraying***: https://nre.tas.gov.au/agriculture/agvet-chemicals/codes-of-practice-guidelines-and-information-sheets/codes-of-practice/code-of-practice-for-ground-spraying • ***Code of practice for spraying in Public Places***: https://nre.tas.gov.au/agriculture/agvet-chemicals/codes-of-practice-guidelines-and-information-sheets/codes-of-practice/code-of-practice-for-spraying-in-public-places		
Signage Management **(CCC – C7 & C8)** **(RAA – C10)**	All signs will be located with the leased boundaries of the Arm End site. The signs will be maintained on good repair and in a clen, tidy and safe condition. The signage is designed to: • Welcome visitors to the site; • Provide basic information about the reserve and the Arm End project; • Allow visitors to safety visit the reserve during construction; • Communicate regulatory messaging (dogs on lead, no fires etc.); • Communicate Leave No Trace messaging; and • Promote respectful visitation. (Refer to Appendix E for the Signage Plan).	Ongoing during operations	Operations Superintendent

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Nutrient Management Strategy ***(RAA – C15)***	A Nutrient Management Strategy has been completed for the Arm End site to manage recycled water and nutrient inputs. (Refer to Appendix Q for the Nutrient Management Strategy)	Prior to commencement of works	Project Manager
All plant and equipment used for the operations must be maintained such that no contaminants are released to the receiving environment	Leaks from plant and equipment must be repaired immediately.	Ongoing	Operations Superintendent
Water Storage Tanks Installation	In earlier design phases the water tanks were to be placed above the existing ground surface but it has become necessary, due to engineering constraints and safety of the structures, to excavate a shallow layer of the ground surface beneath the pads supporting these tanks. As a result of this, Aboriginal Heritage Tasmania (AHT) and the Tasmanian Parks and Wildlife Service (PWS) required the project to provide specialist Aboriginal heritage management advice containing a rationale for the departure from Condition 21 of the Reserve Activity Assessment (RAA3297), which specifies that the excavation of the ground surface at the site of the water tanks is to be avoided.	Prior to installation of water storage tanks	Construction Contractor & Project Manager
Vegetation Management **(CCC – C4 & C12)**	Tree Root Protection Zones must be established around identified trees and maintained during construction works in accordance with AS 4970-2009 to exclude: – Storing of building materials, – Vehicular traffic,	During operational works	Operations Superintendent

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	– Placement of fill; and – Excavation works. No changes to topography or removal, destruction, felling, lopping, ringbarking oof tress other than in accordance with the approved plans without written approval.		
Hygiene Protocols Operation Activities – Weed & Disease Control ***(CCC – C2)***	Hygiene Protocols for all Construction Activities to manage weed and disease control, must include a dedicated hygiene and washdown point or station. This control item must be established prior to works commencing. All machinery to be used for the construction works and operations are to follow the Tasmanian Wash-Down Guidelines for weed and disease control. (Refer to Appendix W) The Weed Management & Revegetation Plan for the Arm End Recreational Reserve should also be used in the management of spreading weeds and pathogens. (Refer to Appendix C – particularly the section on Hygiene Protocols)	Ongoing during operations	Operations Superintendent
Stockpiles of soil generated from civil works	All material to be re-used on site must be stockpiled on-site, in a designated area outlined by the project manager. Generally, stockpiles must adhere to the following; • be maintained effectively so that materials are well sorted, separated and easily accessed for future use; • Drainage is to be directed away from stockpiles; • Stockpiles to be no greater than 1m in height; and • Upstream face of the stockpile shall be silt fenced to prevent overland flow eroding stockpile toes.	For any construction works during operations	Operations Superintendent

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	Any materials that are not to be reused on site must be managed in accordance with the guidelines outlined in Information Bulletin No.105 (EPA Tasmania).		
Use of imported fill	Any civil works that requires the use of imported fill material must use a registered quarry. Documentation for the fill material must be filed and keep as confirmation that the fill material has been purchased from a registered quarry and that it is free of weeds and pathogens.	For all civil works	Operations Superintendent
Demolition of existing infrastructure	Any existing infrastructure within the development footprint that needs to be demolished and disposed of or re-used in accordance with the Environmental Management & Pollution Control Act, 1994 - (http://epa.tas.gov.au/regulation/waste-management).	For demolition works	Operations Superintendent
Competent personnel	The principal contractor must ensure all workers are appropriately qualified, inducted and follow all appropriate control measures to minimise the potential risks associated with the project. Ensure the requirements of the EMP and regulatory environmental procedures are adhered to throughout the duration of the project works. Ensure that all employees associated with the project adhere to the Safe Work Method Statement and/or JSEA's and the site induction procedures to ensure that adverse environmental impacts are minimised.	Ongoing during operations	Operations Superintendent

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7.4 Design and Construction

Rational

To ensure all construction works are completed by a certified engineer.

Objective

Design and construction details to be provided to PWS, CCC & KC prior to commencement of construction works.

Performance Indicator

All works will be supervised by a suitable qualified engineer.

Tasks	Corrective Actions/Monitoring	Timing	Responsibility
Construction activities	A qualified engineer must be used to provide design and construction details for the project.	Prior to commencement of construction works	Project Manager & Verifying Engineer
Access Road & Car Park - Design **(CCC – C10)**	Detailing engineered drawings for the access road & car park associated works must be submitted and approved by PWS & CCC prior to the commencement of works. (Refer to Appendix N for drawings)	Prior to commencement of works	Project Manager
Access Roads & Car Parking **(CCC – C9)**	Driveways, parking zones and other areas accessible to vehicles will be constructed with a gravel seal of suitable material and thickness. Details of construction are provided the engineering drawings. (Refer to Appendix N for drawings).	Prior to the commencement of use	Project Manager

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Water Storage Tanks Installation **(RAA – 21)**	Installation of the water storage tanks must not cut existing ground on the Arm end site; rather approved fill must be used for bedding of the water storage tanks.	Prior to installation of water storage tanks	Construction Contractor & Project Manager
Completion of construction works	Supervising engineer must confirm, in writing, that construction has been substantially completed in accordance with the approved engineering drawings.	Completion of construction works	Project Manager & Verifying Engineer
Site Plan **(RAA - C13)**	Site Plan indicating final layout, taking in account approval requirements must be submitted to and approved by PWS Southern Regional Manager. (Refer to Appendix B for Site Plan).	Prior to commencement of works	Project Manager & PWS
Shared Track Network **(RAA - C14)**	Final micro sitting of the track networks to be undertaken and approved by the Senior Ranger Seven Mile Beach (or delegate)	Prior to commencement of track construction works	Project Manager & PWS
Shared Track Network **(CCC- C21)**	The shared track network will be designed to Class 2 Nature Trail Standard. (Refer to Appendix N for drawings).	Prior to the commencement of use	Operations Superintendent & Design Engineer
Outdoor Lightning **(CCC- C3)**	Outdoor lighting will be appropriately designed, with recessed baffles, to control adverse effects of outdoor lighting outside the boundaries of the site	Ongoing	Operations Superintendent & Design Engineer

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7.5 Natural Values

Rational

Ensure all construction and operational activities are undertaken so that areas of natural value are appropriately managed.

Objective

Limit disturbance or damage to natural values during the project works.

Ensure that conserving and enhancing the environment is achieved and committed Arm End operations and construction works.

Performance Indicator

Limit the disturbance and manage impacts on areas of natural values during Arm End operations and construction works.

Tasks	Corrective Actions/Monitoring	Timing	Responsibility
Botanical Survey ***(RAA – C6)***	An assessment of the botanical values of the site has been completed (Welling Consulting, 2016). This assessment was then used to develop a Weed Management and Revegetation Plan for the site.	Prior to works commencing	Project Manager
Weed and Revegetation Management ***(CCC – C13)***	A Weed and Revegetation Management Plan has been completed and approved for the Arm End site. Work continues to manage the broad scale control of significant weeds on site. (Refer to Appendix C for a copy of the Weed and Revegetation Management Plan).	Ongoing	Operations Superintendent & Project Manager

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Avi- Fauna	An assessment of potential raptor nest records has been completed at the Arm End site. There were no recorded sightings of active nests. (Refer to Appendix M for a copy of the report).	Prior to works commencing	Project Manager
Water Management	A Recycled Water Quality Management Plan (RWQMP) has been completed for the use of recycled water, it documents the ongoing management strategy for recycled water treatment, monitoring and supply. The RWQMP will guide compliance in accordance with the Australian Guidelines for Water Recycling: Managing Health and Environmental Risks, Phase 1 (2006) (AGWR). (Refer to Appendix R for a copy of the RWQMP) An Irrigation Environmental Management Plan (IEMP) has been developed for the use of Class A recycled water (2021). The IEMP has been developed specifically for the Arm End site and golf course and describes how and where recycled water will be used. (Refer to Appendix O for a copy of the IEMP) An Environmental Monitoring Plan (EMP) for the Arm End site has been completed, in	Prior to works commencing	Project Manager

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	consultation with the National Handfish Recovery Team (NHRT), CSIRO and in conjunction with experts in marine ecology. (Refer to Appendix P for a copy of the EMP).		
Geoconservation **(RAA – C7)**	The Mary Ann Bay Shelly Sands have been discussed with a representative of the Natural Values Conservation Branch of DPIPWE. Management controls have been agreed. The key items agreed are as follows; • Mineral Resources Tasmania (MRT) has defined the extent of the Mary Ann Bay Shelly Sands adequately - no further investigations are required to be undertaken; • Arm End plans provided and reviewed, outlined the extent of infrastructure and the works footprint in relation to the MRT mapped geo-conservations area (Condition 7 of RAA subsequently met); • Pre-works inspection required (prior to major civil works) - to enable analysis of the geo conservation area. Inspection to be undertaken by DPIPWE representatives (includes digging test pits to allow samples to be taken and undertake further analysis - e.g., potential for dating materials;	Prior to works commencing	Project Manager

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	• Pre-works inspection will help understand the nature of the landform - whether its marine or aeolian in nature - will contribute to the scientific understanding of the Mary Ann Bay Shelly Sands geo-conservation area; • During construction – minimisation of works that change the landform of the Mary Ann Bay Shelly Sands; • During construction - minimal ground disturbance of the Mary Ann Bay Shelly Sands (as outlined in the plans presented in the meeting - only a low percentage of the geo-conservation area to be impacted by the golf holes and development. • It is important to maintain the existing cliff face exposure of the cross section through the Mary Ann Bay Shelly Sands. The cliff face west of the beach for about 200m should not be obscured, nor access blocked - after weed removal and revegetation has been completed. • Opportunity for further investigations by DPIPWE, (on as required basis), for more scientific understanding of the Mary Ann Bay Shelly Sands.		
Soil Management – Potential Acid Sulfate Soils	An IEMP has been prepared to describe how recycled water will be safely and sustainably	Prior to works commencing	Operations Superintendent

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	utilised on the site. The scope of the IEMP included assessing the site's soil capability and if any risks occur, particular in terms of potential acid sulfate soils (ASS). The IEMP completed a site investigation that include taking soil samples, four (4) test pits were excavated and assessed, with topsoil and subsoil samples collected for laboratory analysis of chemical and physical properties. Based on this assessment the risk of ASS is considered very low for the site where works will be undertaken. Standard soil management practices, recommended for all irrigated land, should apply to the development and ongoing management of the Arm End site. These practices include: • Minimising the period of time that soils are fallowed; • Maintain ground cover as best as possible throughout the year; • Encourage productive vegetative plant growth; • Avoid deep soil tillage and keep the subsoils (which are slightly sodic) covered; and		& Project Manager & Construction Contractor

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	• Where topsoil is moved, ensure that it is replaced.		
Soil Monitoring Program	Arm End will engage a suitably experienced consultant to undertake topsoil monitoring on an annual basis. Soil monitoring will commence post construction of the golf course, once landscaping is complete, and no later than within three months of irrigation commencing (which allows for irrigation on some areas to commence in line with likely construction). Sampling and analysis will be in accordance with the *Environmental Guidelines for the use of recycled water in Tasmania, 2002*. Transects will be plotted for annual topsoil monitoring. Subsoil sampling is recommended on a five-yearly basis (unless there are concerns identified from topsoil monitoring that require further investigation to determine any issues at depth). Topsoil samples are to be taken as transects across the recycled water irrigation areas, and include the following sites: • Fairways and greens on the 4th, 7th, 11th, 15th and 18th holes.		

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7.6 Cultural Heritage (Aboriginal & European)

Rational

Ensure all construction activities are undertaken so that areas of cultural or heritage significance are appropriately managed. All associated works on Arm end must be undertaken in accordance with Permit – P71.

Objective

No disturbance or damage to heritage or cultural sites to occur at any time during the construction and operational works.

The construction of the golf course and associated works will be conducted in accordance with the requirements of Permit – P71 and Aboriginal Heritage Tasmania's – Unanticipated Discovery Plan (refer to Appendix X).

Performance Indicator

No irreparable adverse or unapproved impacts on any areas of cultural or heritage significance to occur at any time during the construction works and operation of Arm End.

Tasks	Corrective Actions/Monitoring	Timing	Responsibility
All construction works at Arm End ***(RAA – C1, C2, C4 & C16)***	Two (2) Phases of the Arm End Aboriginal Cultural Heritage Assessment have been completed. A Permit (P71) has been issued under the *Aboriginal Heritage Act.* This permit will act as the regulatory authority and control for managing Aboriginal Cultural Heritage on site.	Throughout the operational & construction works	Construction Contractor & Project Manager & Operations Superintendent

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	Disturbance to Aboriginal heritage within Arm End (Gellibrand Point NRA), is limited to the impacts permitted under P71 (refer to Appendix L). All construction works and ground disturbance must be completed in accordance with the Unanticipated Discovery Plan (a copy will be on site during works and for operations). If Aboriginal heritage is suspected (**outside of P71 limits**), works must cease immediately. The project manager or delegate must contact Aboriginal Heritage Tasmania to inform them of the potential discovery. Refer to Appendix x. After discussions and review of this EMP_V1, with PWS and AHT a subsequent Aboriginal Heritage Assessment has been completed for the site access road, car park, water tanks and maintenance area. As well as the broader issues of sensitivity at the site. All recommendations from this Report will be implemented for the project. A copy of this Report is provided in Appendix W.	Throughout the operational & construction works	Construction Contractor & Project Manager & Operations Superintendent
Specific Aboriginal Heritage Sites • AH9924 • AH11685	Temporary fencing will be erected to avoid these aboriginal heritage sites. 'No Go' exclusion zones will be implemented.	Throughout the construction works	Construction Contractor & Project Manager

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(RAA –C19)	Any proposed drilling with the Gellibrand Point NRA will need to be at a depth of 3m below the current ground surface. All identified Aboriginal Cultural sites will be identified as an 'exclusion zone',- these areas will be demarcated with fencing and adequately signed. These exclusion zones will be identified and outlined to the Principal Contractor on site. The site plan identifies the Aboriginal Cultural Heritage sites (refer to Appendix B). This information will additionally be communicated via site inductions for all contractors working on site.		
Specific Aboriginal Heritage Site • AH13616 ***(RAA – C20)*** ***NOTE: This was included in CEMP for the South Arm Pipeline Project***	Pipeline works will need to proceed at a depth of 3m in the vicinity of this aboriginal heritage site.	Throughout the construction works	Construction Contractor & Project Manager
Aboriginal Heritage Monitoring ***(RAA –C3)***	Site plans will have all nominated Cultural Heritage sites identified. All identified Cultural Heritage sites will be demarcated on site and regularly (weekly) monitored to ensure they are adequately managed and preserved.	Ongoing	Operations Superintendent & Ochre- Rain

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	(Monitoring will include visual inspections , photographic evidence and documentation of these weekly inspections – undertaken by Ochre-Rain – specialist in aboriginal heritage management). This monitoring program will be reported to regulatory authorities monthly to ensure adequate management of aboriginal heritage is occurring on site (PWS/AHT & CCC). Ochre - Rain will partner the Arm End project to delivery best practice Aboriginal Heritage management for the project		
Formation of Track Network and Roads	Geo-fabric to be laid over the areas to be impacted prior to placement of any additional material.	Prior to building track networks & roads	Construction Contractor & Project Manager & Operations Superintendent
Aboriginal Heritage Mitigation	A Copy of P71 must be always on site. All workers and employees must be inducted and understand the management of aboriginal heritage during any works undertaken. All persons involved in the works will be made aware of the location of existing relics and will be made familiar with the requirements of P71	Ongoing	Construction Contractor & Project Manager & Operations Superintendent
Gellibrand Vault	No works near the immediate vicinity of the Gellibrand Vault to ensure adequate protected from damage.	Throughout the operational	Construction Contractor &

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(CCC – C15)	the Gellibrand Vault will be identified as an 'exclusion zone',- these areas will be demarcated with fencing and adequately signed. These exclusion zones will be identified and outlined to the Principal Contractor on site. The site plan identifies the Gellibrand Vault site (refer to Appendix B). This information will additionally be communicated via site inductions for all contractors working on site. The Gellibrand Vault site will be regularly (monthly) monitored to ensure it is adequately managed and preserved. This monitoring program will be reported to regulatory authorities (PWS & CCC).	& construction works	Project Manager & Operations Superintendent
Gellibrand Vault **(CCC – C18)**	Landscaping (weed removal and planting of grasses) and track refurbishment adjacent the Gellibrand Vault will be improved to act as an effective buffer to between the Arm End development and the Vault. For more detail on the proposed minor works, which includes access to existing viewing platform and existing interpretation signage Refer to Landscaping Plan – Appendix D - drawing LMPO4.	Throughout the operational & construction works	Construction Contractor & Project Manager & Operations Superintendent
Gellibrand Vault - Signage **(CCC – C19)**	Existing interpretive signage is provided for the Gellibrand Vault.	Throughout the operational &	Construction Contractor &

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	In consultation with Heritage Tasmanian minor refurbishing works to the existing walking access will be implemented. These works will include formalising the area in front of the existing signage with new gravel, so that the public can read the sign and their access managed by using the upgraded and defined access path.	construction works	Project Manager & Operations Superintendent
Competent personnel	The Operations Superintendent must ensure all workers are appropriately qualified, inducted and follow all appropriate control measures to minimise the potential risks associated with the Project. Ensure the requirements of the BPEM and environmental procedures are adhered to throughout the duration of the Project. Ensure that all employees associated with the Project adhere to the project, JSEA's and the site induction procedures to ensure that adverse heritage impacts are minimised.	Ongoing	Construction Contractor & Operations Superintendent

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7.7 Erosion and Sediment Control

Rational

The programming of works and implementation of control measures has a major influence on how effective erosion and sedimentation controls are in reducing on-site disturbance and any potential impacts to the receiving environment.

Objective

Before commencement of site works implementation of the following will occur;

- Schedule earthworks so that ground disturbance is minimised;
- Install and maintain erosion and sediment control measures in accordance with the following guidelines;

Soil and Water Management on Building Sites

https://epa.tas.gov.au/epa/water/stormwater/soil-and-water-management-on-building-sites

Wetlands and Waterways Works Manual

https://dpipwe.tas.gov.au/conservation/flora-of-tasmania/tasmanias-wetlands/wetlands-waterways-works-manual

1. Install sediment fences or fibre rolls at the lower gradient end of site works to establish a sediment control and trap sediment.
2. Divert any up-slope catchment water runoff around the work site by installing diversion drains.
3. Keep as much vegetation as possible to minimise soil erosion and reduce rainwater running across the site.
4. Designate a location where topsoil and other excavation material will be stockpiled during construction. Provide suitable controls to prevent erosion.
5. Stabilise areas of exposed soil with vegetation *or* erosion control blankets and mats.
6. Protect the nearby stormwater system including any stormwater pits on the work sites from blocking up with sediment.
7. Designate an appropriate location within the work sites where sediment generating activities can be effectively managed and controlled.

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Performance Indicator

Minimise on site land disturbance and impacts to the receiving marine environment any terrestrial waterways.

Tasks	Corrective Actions/Monitoring	Timing	Responsibility
Erosion and Sediment Control – Key Principles	• Prevent Erosion • Minimise Clearing • Revegetate • Seperate Clean Water • Capture Runoff • Reuse water on-site	Ongoing for construction & operations	Construction Contractor & Operations Superintendent
Erosion and Sediment Control Plan ***(RAA –12)*** **(CCC – C11)**	An Erosion and Sediment Control Plan has been completed for the Arm End Car Park and Access Road engineering design and the detail of this plan is included in the drawing set (refer Appendix N). A site wide Erosion Control Plan is provided in the Landscape Master Plan refer to drawing LMP05 (refer to Appendix D)	During construction works	Project Manager & Construction Contractor
Installation of sediment fencing and other erosional control measures ***(RAA – C12)*** **(CCC – C11)**	Routine inspections of sediment fencing and erosion controls. Items to inspect during monitoring; • Sediment fence not keyed in correctly (i.e., not dug into the ground at least 100mm);	Weekly during construction works	Construction Contractor & Operations Superintendent

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	• Build-up of sediment excess 1/3 of the height of sediment fence; • Tears or rips in fence; and • Sediment fences lying down or covered by sediment/other material.		
During constructions works ***(RAA – C12)*** **(CCC – C11)**	Monitor and maintain sediment and erosion control measures.	Weekly or after a high rainfall event	Project Manager & Construction Contractor
During installation of services ***(RAA – C12)*** **(CCC – C11)**	Construct service trenches away from where water is likely to concentrate. Minimise the duration that service trench excavations are exposed.	During installation of services	Construction Contractor
Erosion and sediment control measures - Sediment Fencing for construction works ***(RAA – C12)*** **(CCC – C11)**	Sediment Fence for all constrcution works must be completed and installed in accordance with the following generally arrangment drawing & construction notes.	Ongoing for construction works	Project Manager & Construction Contractor

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	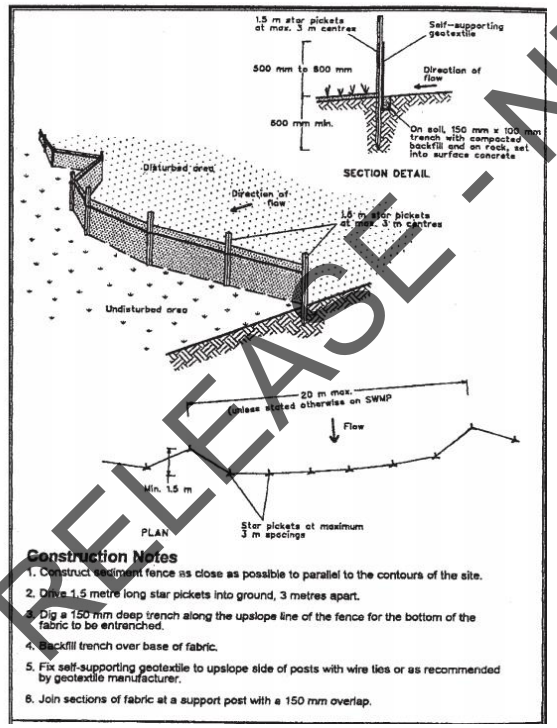		
Stockpiling of material for construction works	Stockpiling of materials for constrcution must be completed in accordance with the following generally arrangment drawing drawing & construction notes.	Ongoing for construction works	Project Manager & Construction Contractor

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	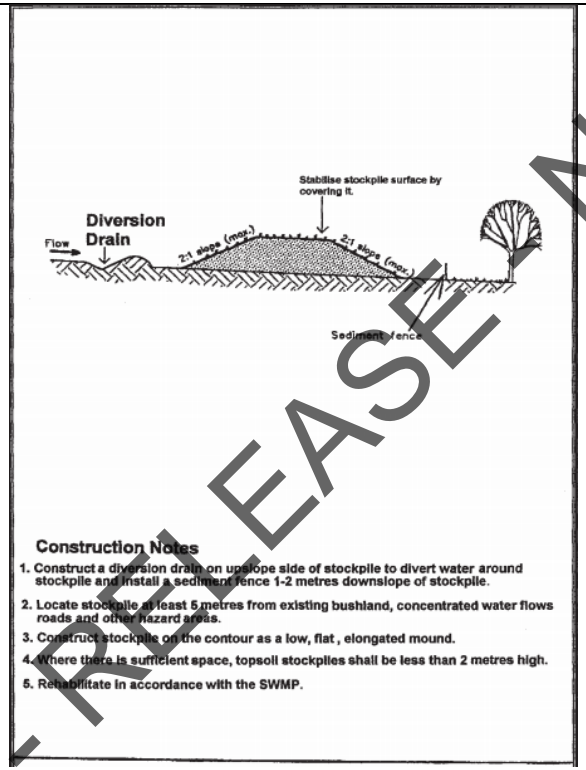		
Existing Stormwater Infrastructure	Protection of exisiting on-site stormwater outlets must be completed in accordance with the following generally arrangment drawing drawing & construction notes.	Ongoing for construction works	Construction Contractor & Project Manager

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	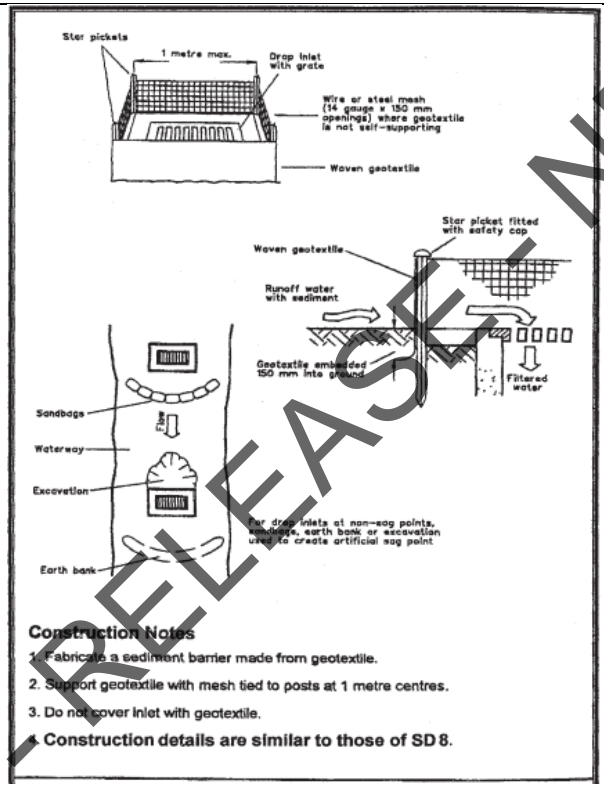		
High Rainfall Event	Following significant rainfall events (i.e. 20mm in 24 hours), an inspection will be undertaken by the Porject Manager, Contractor Superintendent, and work crew. This inspection will be documented and will include a documented action plan for any works required to be undertaken to rectify, repair or improve erosion and sediment control devices.	Following significant rainfall events	Construction Contractor & Project Manager

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7.8 Hazardous Materials

Rational

Construction and operational activities for Arm End will involve the use of hazardous materials such as, fuels, lubricants, and oils. Each work site is required to be effectively managed to prevent impacts on human health and the receiving environment as a consequence of an accidental release or spillage of a hazardous material associated with any works.

Objective

To effectively manage the safe storage, handling, and disposal of hazardous materials for the duration of all works undertaken.

Performance Indicator

No adverse human health and environmental impacts associated with hazardous materials is experienced during construction and operational works.

Appropriate storage, handling and disposal of hazardous materials to be evident in all activities undertaken at Arm End.

Tasks	Corrective Actions/Monitoring	Timing	Responsibility
Hazardous material storage	All hazardous materials that are required must be stored at the designated hardstand area onsite, that is bunded. Or stored on spill trays which are designed to contain at least 110% of the total volume of material. Spills kits must be stored and maintained within the bunded hazardous materials storage area. Adequate lighting must be supplied.	Throughout the duration of operations and construction	Construction Contractor & Operations Superintendent
Chemical and Fuel storage	Maintenance inspections will be undertaken to adequality manage the Chemical and Fuel storage areas.	Weekly	Operations Safety Officer
Release of hazardous substance to the environment	If any release of a hazardous substance to the environment occurs the Environmental Incident	Throughout the duration of operations	Construction Contractor

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	Reporting Procedure (Section 6.5) must be followed. Spill Kits must be kept in appropriate locations to assist with the containment of spilt environmental hazardous materials. Safety Officer to conduct inspections of the bunded hazardous materials storage area, including spill kits, on a regular basis.	and construction	& Operations Safety Officer
Construction activities	The Contractor must ensure sufficient management controls are implemented to mitigate potential spills entering the marine environment. The contractor must ensure adequate spill kits are available to aid spill response.	Throughout the duration of construction	Construction Contractor
Material Safety Data Sheets (MSDS) must be located at the project office/maintenance facility for all hazardous materials used during the construction and operation.	The Superintendent will ensure that all materials are handled, stored, used, and disposed of in accordance with their MSDS.	Throughout the duration of the works and operations	Operations Superintendent & Construction Contractor
Competent personnel	The operations superintendent must ensure all workers are appropriately qualified, inducted and follow all appropriate control measures to minimise the potential risks associated with the Project. Ensure the requirements of the BPEM and environmental procedures are adhered to throughout the duration of the Project. Ensure that all employees associated with the project adhere to the project SWMS and/or JSEA's and the site induction procedures to	Ongoing	Operations Superintendent & Construction Contractor

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	ensure that adverse environmental impacts are minimised.		

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7.9 Waste Management

Rational

Waste management at the Arm End site must focus on appropriate methods to minimise the generation of wastes maximise reuse and recycling and appropriately dispose of waste materials generated as a result of the project works.

Objective

Ensure waste materials from the work areas are managed and disposed of in accordance with the provisions in the EMPCA.

Performance Indicator

No waste material is released from the project site in an uncontrolled manner.

Tasks	Corrective Actions/Monitoring	Timing	Responsibility
Accumulated vegetation or similar **(CCC – C14)**	Management of accumulated vegetation must be controlled by; • Chipping/mulching for removal or reuse on site; or • Removal from site to a location approved by CCC - Senior Environmental Health Officer (prior to removal); or • Taken to a waste management facility license to take such material (receipt to be retained as proof of disposal location); or • Other method approved in writing by CCC - Senior Environmental Health Officer. No on site burning unless approved in writing by CCC - Senior Environmental Health Officer	Ongoing	Operations Superintendent

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	(any approved burring will not be within 500m of a habitable building).		
Building material – accumulated building debris (including paper, cardboard, plastic, wood etc.) **(CCC – C14)**	Must be removed from site and disposed of at a waste management facility license to take such material. No on -site burning is permitted of building debris	Ongoing	Construction Contractor & Operations Superintendent
Nutrient Management Strategy	A Nutrient Management Strategy has been completed for the Arm End site to manage recycled water and nutrient inputs. (Refer to Appendix Q)	Prior to commencement of works	Project Manager
Waste management hierarchy	Waste must be managed in accordance with the following: • Waste must be minimised to the maximum extent that is reasonable and practical, having regard to best practice environmental management; • Waste should be reused or recycled to the maximum extent that is practical; and • Waste that must be disposed of must be done in a way that has been approved in writing by the relevant planning authority or the EPA to receive such waste and in accordance with the provisions in the EMPCA. Project Manager/Operations Superintendent to inspect waste schedule and waste storage areas to ensure management control measures are being enacted.	Ongoing	Construction Contractor & Operations Superintendent

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Management of wastes	The Operations Superintendent will undertake monthly inspections to ensure the management of wastes from Arm End are being undertaken in accordance with best practice guidelines.	Monthly	Operations Superintendent
Competent personnel	The principal contractor must ensure all workers are appropriately qualified, inducted and follow all appropriate control measures to minimise the potential risks associated with the project. Ensure the requirements of the EMP and regulatory environmental procedures are adhered to throughout the duration of the project works. Ensure that all employees associated with the project adhere to the Safe Work Method Statement and/or JSEA's and the site induction procedures to ensure that adverse environmental impacts are minimised.	Ongoing	Construction Contractor & Operations Superintendent

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7.10 Noise Emissions

Rational

Construction works will involve the use of a variety of plant and equipment, including boats/barges, drill rig, excavators, and trucks. It is considered they present a low risk of noise nuisance occurring to sensitive noise receptors, such as residents, in relation that the heavy machinery will be used primarily within the road corridor and as such vehicle noise is expected.

Conversely, Operational activities could potentially result in noise nuisance.

Accordingly, appropriate management control measures are required to ensure that noise produced, does not result in environmental nuisance noise occurring.

Objective

To implement adequate management control measures to mitigate potential impacts to an acceptable level at the closest sensitive noise receptors during construction and operational works.

Performance Indicator

To comply with the noise mitigation measure, as defined below

Tasks	Corrective Actions/Monitoring	Timing	Responsibility
Operating hours – Construction related activities associated with the project must only be undertaken between 7.00 am and 5.00 pm Monday to Friday. **(CCC – C5)**	All operators/contractors will adhere to the stipulated working hours for the construction activities for the duration of the project.	Ongoing	Construction Contractor & Project Manager
During construction works associated with the project the following noise mitigation measures must be implemented; • The contractor must ensure that all plant and equipment used is well maintained, including mufflers on plant, assembly of equipment to eliminate unnecessary free	Project manager to conduct routine inspections/audits to ensure control measures are being implemented	During construction works	Construction Contractor & Project Manager

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movement and lubrication of moving equipment were deemed necessary.	The contractor shall maintain service records for all plant and equipment used for the duration of the project		
Competent personnel	The project manager must ensure all workers are appropriately qualified, inducted and follow all appropriate control measures to minimise the potential risks associated with the Project. Ensure the requirements of the BPEM and environmental procedures are adhered to throughout the duration of the Project. Ensure that all employees associated with the project adhere to the project SWMS and/or JSEA's and the site induction procedures to ensure that adverse environmental impacts are minimised.	Throughout the duration of the project & operations	Operations Superintendent & Construction Contractor

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7.11 Air Quality

Rational

Construction works has the potential to increase local air emissions on nearby receptors and increase dust generation within the associated works areas.

Objective

To implement effective control measures to minimise emissions of potential air emissions, including dust, associated with the construction works.

Performance Indicator

No complaints received from nearby receptors due to construction activities.

No adverse impacts on adjacent residents' properties.

No adverse impacts on staff health.

Tasks	Corrective Actions/Monitoring	Timing	Responsibility
Maintenance of Plant & Equipment	All Plant & Equipment must be well maintained and serviced, with standard filters fitted.	Ongoing	Construction Contractor
Construction works - Management of dust **(CCC – C25)**	When conducting construction works the following management controls must be initiated: • Road sweeper must be used (were required); • Covering loads of materials with tarpaulin when in transit; • Limiting dust generating activities in windy conditions; and • Use water sprays where necessary.	During construction works	Construction Contractor
All operational works - Management of dust **(CCC – C25)**	All dust emissions must be controlled to the extent necessary to prevent environmental nuisance.	Ongoing	Construction Contractor

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			& Operations Superintendent
Competent personnel	The project manager must ensure all workers are appropriately qualified, inducted and follow all appropriate control measures to minimise the potential risks associated with the Project. Ensure the requirements of the BPEM and environmental procedures are adhered to throughout the duration of the Project. Ensure that all employees associated with the project adhere to the project SWMS and/or JSEA's and the site induction procedures to ensure that adverse environmental impacts are minimised.	Throughout the duration of the project	Project Manager & Construction Contractor

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7.12 Traffic Management

Rational

Impacts from vehicle movements may be experienced at sensitive locations across the project footprint; these should be managed where practical.

Objective

To provide a safe working environment by minimising disruptions/impacts to south arm road and the surrounding environment.

Performance Indicator

Impacts to the transport network are minimised during the project works.

Traffic management plans (if/where required) must be implemented to manage public access.

Tasks	Corrective Actions/Monitoring	Timing	Responsibility
Maintain two-way traffic flows where possible	If road closures are required, approval from the Project Manager and appropriate regulatory must be given. A Traffic Management Plan, endorsed by a qualified Traffic Services company (in accordance with Austroads Guidelines) must be implemented for any proposed lane closures for construction works.	Ongoing	Project Manager
Car parking **(CCC – C6 & C10)**	Car parking must be provided on the Arm End site for the public. Engineering design plans for the access road and car parking arrangement are provide in Appendix N.	Prior to the commencement of use	Project Manager
Competent personnel	The Project Manager must ensure all workers are appropriately qualified, inducted and follow all appropriate control measures to minimise the potential risks associated with the Project.	Ongoing during the construction works	Construction Contractor & Project Manager

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	Ensure the requirements of the BPEM and environmental procedures are adhered to throughout the duration of the Project. Ensure that all employees associated with the Project adhere to the project, JSEA's and the site induction procedures to ensure that adverse heritage impacts are minimised.		

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8. References

Crafter & Mogford Golf Strategies 2021 – Landscape Master Plan;

Derwent Estuary Program & NRM South, 2008 - Soil and Water Management on Large Building and Construction Sites:

Elgin, 2020 – Environmental Monitoring Plan – Arm End Public Recreation Reserve & South Arm Pipeline;

Enviro Dynamics, 2020 – Raptor Nest Assessment;

Enviro Dynamics, 2018 – Weed Management and Revegetation Plan- Arm End Public Recreation Reserve;

Living Turf, 2020 – Nutrient Management Strategy;

Pinion Advisory, 2021 – Recycled Water Quality Management Plan;

Wetlands and Waterways Works Manual (DPIPWE);

Welling Consulting, 2016 – Botanical Report for Arm End Recreational Reserve; and

Tasmanian Wash-down Guidelines for Weed and Disease Control – Machinery, Vehicles & Equipment (Edition 1 - 2004).

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9. Sign Off

I confirm that I have read and understood the requirements and my responsibilities in implementing and complying with this EMP.

NAME	DATE	NAME	DATE

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Appendix A - Corrective Action Request Form

Corrective Action Request Form

Report No: _____

Date: _____

Details of Non – Compliance: Inspected by: Date:
Details of Proposed Actions: Principal received: y/n Date:
Consultant Advice (as required): Signed (By Principle or delegate): Date:
Approval to Proceed: Sign: Date:
Actions Conducted: Sign: Date:
Sign Off: (Inspection required) Sign: Date:

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Appendix B - Site Plan

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Appendix C - Weed Management and Revegetation Plan

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Appendix D - Landscape Master Pan

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Appendix E - Signage Plan

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Appendix F - Emergency Response Plan

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Appendix G - Bushfire Hazard Management Plan

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Appendix H - Bushfire Emergency Plan

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Appendix I - Communications Plan

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Appendix J - Workplace Health & Safety Policy Manual

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Appendix K - Botanical Assessment

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Appendix L - Aboriginal Heritage - P71

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Appendix M - Raptor Nest Assessment

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Appendix N - Carparking & Access Road Drawings

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Appendix O - Irrigation Environmental Management Plan

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Appendix P - Environmental Monitoring Plan

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Appendix Q - Nutrient Management Strategy

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Appendix R - Recycled Water Quality Management Plan

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Appendix S - Site Irrigation Design & Irrigation Network

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Appendix T - Risk Management Plan

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Appendix U - Dog Management Plan

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Appendix V - Washdown Guidelines Weed and Disease

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Appendix W - Arm End Aboriginal Heritage Addendum Report

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Appendix X - Unanticipated Discovery Plan

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