



SHIRE OF  
**COCOS**  
KEELING  
**ISLANDS**

Shire of Cocos (Keeling) Islands

# Waste and Resource Recovery Facilities

BUSINESS CASE

January 2024

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# Abbreviations

Abbreviation	Description
CKI	Cocos (Keeling) Islands
IOT	Indian Ocean Territories
SoCKI	Shire of Cocos (Keeling) Islands
SoCI	Shire of Christmas Island
WTS	Waste Transfer Station
DITRDCA	Department of Infrastructure, Transport, Regional Development, Communications and the Arts

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# 1 EXECUTIVE SUMMARY

This Business Case has been prepared for the Shire of Cocos (Keeling) Islands (the Shire) to provide an evidence-based justification for the Shire of Cocos (Keeling) Islands Waste and Resource Recovery Facilities Project.

The proposed project seeks to strategically address the multifaceted waste challenges, while simultaneously advocating for sustainable waste practices in alignment with national targets, and delivers on key priorities identified by the Department of Infrastructure, Transport, Regional Development and Communications and the Arts in the Indian Ocean Territories Waste Management Strategy.

The Cocos (Keeling) Islands face significant challenges in waste management due to their remote location and limited resources. The Cocos (Keeling) Islands lack proper waste management infrastructure, resulting in environmental pollution, health risks, and a negative impact on the islands' natural beauty. The only current options for waste management are open burning, stockpiling, and shipping waste 3,000 km to mainland Australia, incurring high costs for residents and government agencies. Moreover, the current practices are not aligned with national waste management targets and do not support the sustainable development goals of the islands.

The current waste generation and disposal approaches on the islands are considered unsustainable and have potential to cause serious health, safety, and environmental issues. These risks include:

- Emissions to air, groundwater contamination, and leaching of pollutants (nutrients, heavy metals).
- Inappropriate waste management and stockpiling attracts pests such as mosquitoes, flies, feral cats, and rats.
- Pathogens from sewage sludge disposal pose environmental and public health risks.
- Proximity issues from waste facilities located close to sensitive environmental receptors like water bodies, native vegetation, and heritage sites.

The project is expected to provide significant and tangible benefits to the Shire and broader community both during and post construction. These benefits include but are not limited to:

- Enhancement of amenities and liability,
- Best practice waste management infrastructure and processes,
- Increased employment,
- Improved environmental outcomes,
- Improved health and safety outcomes,
- Community use of the facility,
- Opportunities for volunteering,
- Increased skills development for local population.

The project has been established with three key investment objectives:

1. Provide a waste and resource recovery solution that enhances amenity and liability, minimises environmental and social impacts, and enables the transition to a circular economy that encourage and promote waste management and minimisation activities.
2. Safely dispose or residual waste from residential and commercial operators, alongside tackling legacy and non-municipal waste, in keeping with best practice and alignment with national waste management targets.
3. Be a cost-effective waste management solution.



## 2 PROJECT PURPOSE

### 2.1 Introduction

This business case was prepared for the Shire of Cocos (Keeling) Islands (the Shire) to provide justification for the establishment of Waste and Resource Recovery Facilities on the islands. The aim is to strategically address the multifaceted waste challenges, while simultaneously advocating for sustainable waste practices in alignment with national targets.

The Cocos (Keeling) Islands face significant challenges in waste management due to their remote location and limited resources. The Cocos (Keeling) Islands lack proper waste management infrastructure, resulting in environmental pollution, health risks, and a negative impact on the islands' natural beauty. The current practices are not aligned with national waste management targets and do not support the sustainable development goals of the islands.



Historically, funding constraints and challenges specific to the local environment have restricted the implementation of traditional waste management options within the Indian Ocean Territories (IOT), which are commonly used on the Australian mainland. As such, there is a gap between current waste management performance and both national and state waste management targets. Moreover, the current waste management practices being adopted, such as open burning, are detrimental to the environment and public health.

The imperative for improved waste management practices is underscored by the 'Cocos (Keeling) Islands 2030 Strategic Plan', aiming for Best Practice Waste Management and aligning with key environmental actions outlined in the plan. CKI, currently heavily reliant on the Australian Government, recognise the need to broaden their experience and infrastructure for enhanced resilience and sustainability.

Moreover, there is a strong community sentiment towards improved waste management practices in the IOT. Ultimately, appropriate waste management is fundamental to the liveability of the IOT and ensuring the Shires can continue to meet the strategic values, vision, and direction of the Commonwealth.

The IOT Waste and Resource Recovery Strategy (DITRDCA) has been fundamental in the development of the proposed waste management project. The purpose of the IOT Waste Strategy is to provide an overarching vision for waste management in the IOT and outline a realistic pathway for improving waste management through the development of better practice goals.

There are several prior reports and studies that substantiate the need for this project and demonstrate why 'business as usual' is not an adequate response to addressing the identified problem, including:

- Cocos (Keeling) Islands 2030 Strategic Plan<sup>1</sup>
- GHD 2023, Waste and Resource Recovery Strategy | Indian Ocean Territories – Christmas Island and Cocos (Keeling) Islands, DITRDCA (found within supplementary supporting attachments)
  - o GHD 2022, 'IOT Review of Current Waste Management Status Report', DITRDCA.
  - o GHD 2022, 'Report and Best Practice Waste Management for Islands Report, DITRDCA.
  - o GHD 2022, 'Best Practice Waste Management for Islands Report', DITRDCA.
  - o GHD 2022, 'General Waste Management Report', DITRDCA.
  - o GHD 2022, 'Marine Debris Management Report', DITRDCA.
- Shires Strategic Community Plan, 2022<sup>2</sup>
- Cocos (Keeling) Islands Plastic Recycling Assessment University of Western Australia, 2021<sup>3</sup>

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<sup>1</sup> IOTRDOA 2019, 'Our Cocos (Keeling) Islands 2030 Strategic Plan', [Our Cocos \(Keeling\) Islands – 2030 Strategic Plan \(March 2019\) produced by the Indian Ocean Territories Regional Development Organisation \(RDO\) | Department of Infrastructure, Transport, Regional Development, Communications and the Arts](#)

<sup>2</sup> Shires Strategic Community Plan, 2022 [PowerPoint Presentation \(shire.cc\)](#)

<sup>3</sup> University of Western Australia, Cocos (Keeling) Islands Plastic Recycling Assessment, March 2021, [Microsoft Word - Cocos Keeling Island Plastic Report 2021.doc \(shire.cc\)](#)

## 2.2 Project Context

### 2.2.1 Locality

The municipality of the Shire of the Cocos (Keeling) Islands encompasses all the Territory of the Cocos (Keeling) Islands. The islands are an Australian Territory located in the Indian Ocean at Latitude 12 deg 10' South longitude 96 deg 50' East. The islands lie 2,768 km north-west of Perth, 3,685 km due west of Darwin, approximately 900 km south-southwest of Christmas Island and approximately 1,000 km south-west of Java and Sumatra. The highest point above sea level is 9 metres which is located on South Island.

*Figure 1: Cocos (Keeling) Islands Map*



The CKI territory consists of two atolls made up of 27 coral islands, with a total area of approximately 14 km<sup>2</sup>. Of the 27 islands, only two are inhabited. The two inhabited islands are Home Island, the home of the Cocos Malay community and the Shire Office, with a population of 404, and West Island on which is located the airport, Government offices, the homes of virtually all Government and contracted employees, and some private residences, with a population of 140.

### 2.2.2 Current State

The Cocos (Keeling) Islands are facing a waste crisis and grappling with decades of accumulated waste due to limited space for traditional disposal methods. Erosion and inundation threaten the islands, making landfill impractical/impossible. The only current options for waste management are open burning, stockpiling, and shipping waste 3,000 km to mainland Australia, incurring high costs for residents and government agencies.

The current waste generation and disposal approaches on the islands are considered unsustainable and have potential to cause serious health, safety, and environmental issues.

Risks include:

- Emissions to air, groundwater contamination, and leaching of pollutants (nutrients, heavy metals).
- Inappropriate waste management and stockpiling attracts pests such as mosquitoes, flies, feral cats, and rats.
- Pathogens from sewage sludge disposal pose environmental and public health risks.



- Proximity issues from waste facilities located close to sensitive environmental receptors like water bodies, native vegetation, and heritage sites.

### Current Waste Generation and Disposal Approaches

On CKI, landfilling is not considered a viable long-term management solution for residual waste on the islands due to the limited land space, generally low-lying terrain, and a shallow water table, with depth to groundwater less than 2 metres. As such, the majority of waste is currently open burnt. SoCKI has previously had a diesel-fuelled incinerator, installed on Home Island in 2015 to dispose of most of the residual waste generated. An assessment undertaken in May 2022 by an independent consultant determined that the unit was not fit for purpose and posed a safety hazard to operations staff. As a result, SoCKI ceased incineration operations and the regulator, WA Department of Water and Environmental Regulation (DWER) has temporarily permitted open burning until an alternate interim solution is identified and implemented. Open burning is not a long-term nor sustainable solution.

Currently on CKI, regular kerbside collection services are provided for residents and businesses, and self-hauled waste is accepted at Shire-operated waste management facilities. CKI offer a residual waste collection service and fortnightly household collection of pre-separated recyclable glass and aluminium containers, in separate bins.

As of 23 November 2022, the Shire temporarily banned the acceptance of all non-putrescible household waste<sup>4</sup>. In July 2023, SoCKI introduced a fee structure at Waste Transfer Stations (WTSs) to achieve full cost recovery. Cocos Islanders are accustomed to a high cost of living, known locally as the "paradise tax." The community rejects the idea of full-cost recovery on waste and advocates exploring various options.

### Stockpiling

Outdoor stockpiling includes crushed glass, waste oil, batteries, white goods, and miscellaneous commercial assets. Compacted aluminium cans are stored inside the transfer station as there have previously been contamination issues with this material when returned to Australia for recycling. The majority of stockpiled waste lacks a readily accessible end market. Large stockpiles of vehicles, small and large plants and machinery, asbestos, batteries, fire extinguishers, paint, e-waste, steel, aluminium, and waste oil persist due to a lack of offshore disposal for these items since 2005.

*Figure 2: Stored material on West Island (1)*



<sup>4</sup> SoCKI 2022, 'CEO Update'

Figure 3: Stored material on West Island (2)



### Waste Ownership

Waste on West Island is primarily generated by Commonwealth agencies and Contractors including, but not limited to the airport, Royal Australian Air Force (RAAF) base, IOT Administration (IOTA) and IOT Health Services. Waste is also generated by the tourism industry, including the motel and other tourist accommodation, clubs, and cafes.

Historically, there has been a problem with waste generator ownership in the IOT. Lack of accountability and acceptance of waste management responsibility by stakeholders, particularly regarding obsolete assets, have created legacy waste issues on the islands. Currently a total of 42 Commonwealth obsolete assets have been identified on CKI with many more abandoned assets that have not been accounted for or captured in asset registers<sup>5</sup>. The Commonwealth has refused to pay waste fees and charges and rates for the 2023/24 financial year.

### Legacy Waste

The current legacy waste estimation is at 1000 tonnes across both Home and West Islands, primarily Commonwealth waste with the majority stockpiled on West Island. Items include white goods, complete cars, roofing iron, machinery, and general domestic steel. A recent quote for the Net Disposal Cost of

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<sup>5</sup> Part A: Asset Disposal Management, Indian Ocean Territories – Christmas Island and Cocos (Keeling) Islands, Department of infrastructure, Transport, Regional Development and Communications and the Arts, 2022.



legacy waste is \$2,992,983 after a recycling rebate of \$442,857. This quote has been prepared by Birdon and has been attached as supplementary documentation to the grant application.

## Marine Debris

Managing the accumulation of marine debris on the islands of the IOT is an ongoing challenge, with a recent study, published by the University of WA, found the Cocos (Keeling) Islands were among the most heavily affected by beached waste in the Indian Ocean<sup>6</sup>.

The IOTs are located in the path of the Indonesian Through Flow (ITF) current where oceanic waters are transported westwards from the Pacific to the Indian Ocean. The ITF current collects waste debris from the rivers and seas of Indonesia and transports them to the IOT region. Additionally, the IOT region experiences a convergence of various currents, including the eastern extents of the Indian Ocean Gyre. Marine debris in CKI has been recorded in marine, intertidal, and terrestrial environments, which threaten organisms associated with these habitats. Marine debris can also have implications on human health and the local economy, particularly when tourism is the primary industry.

*Figure 4: Common marine plastic debris in the CKI.*

*(a) PET bottles with PP or HDPE caps (b) rubber thongs (c) expanded polystyrene fishing float (d) rope mass (e) bottle cap (f) mixed plastic (soft plastic and lighter).*



## Projected Waste Generation

In 2021, estimated waste disposal on West Island and Home Island was 467 and 730 tonnes (around 1,200 tonnes total), respectively. Projections suggest an increase to 630 and 1,083 tonnes (around 1,700 tonnes total) by 2030. Accurate assessment is challenging due to unattended transfer stations and open burning practices.

<sup>6</sup> University of Western Australia, Cocos (Keeling) Islands Plastic Recycling Assessment, March 2021, [Microsoft Word - Cocos Keeling Island Plastic Report 2021.doc \(shire.cc\)](#)

This is only further exacerbated by transient groups such as fly-in fly-out (FIFO) workers and visitors (tourists) which strain existing infrastructure and assets within the IOT. For CKI, the population on West Island can vary significantly as a result of Commonwealth-related projects. For example, during the airport runway upgrade, it is expected that West Island's population will double which will only exacerbate the issue of waste management.

## Waste flows

The Waste and resources recovery strategy illustrated the waste flows from available data in 2021.

Figure 5: Waste flows Home Island

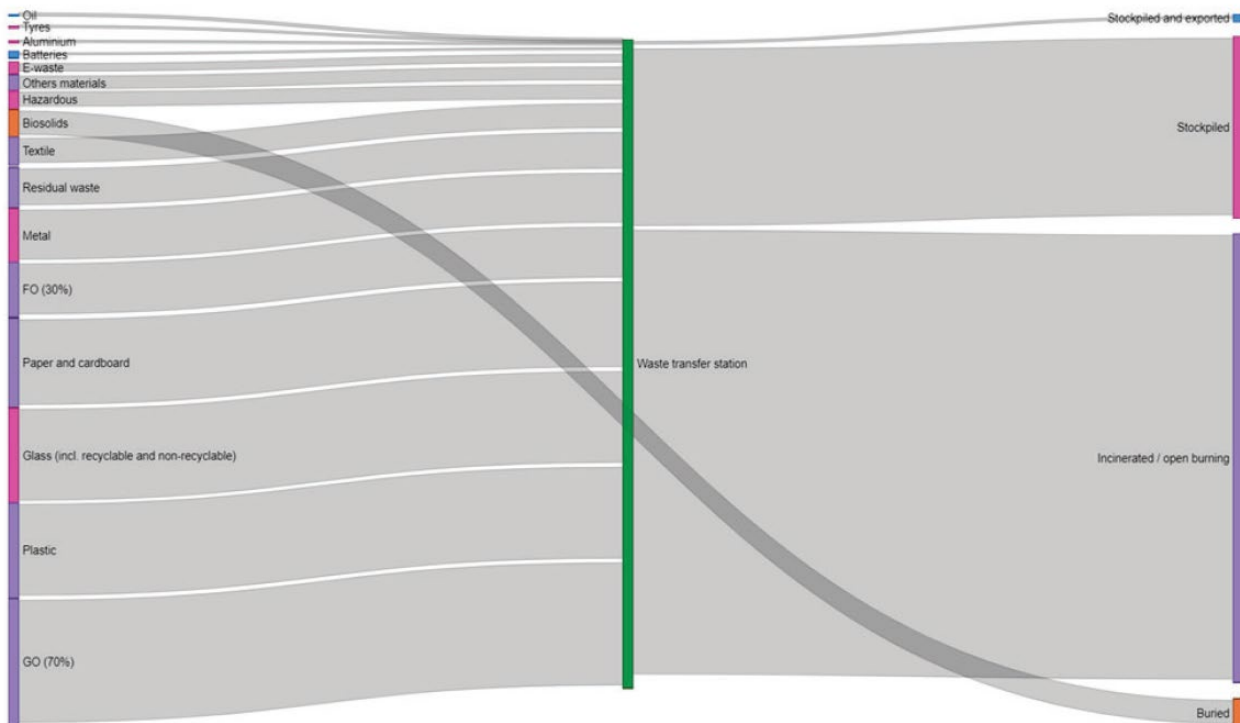
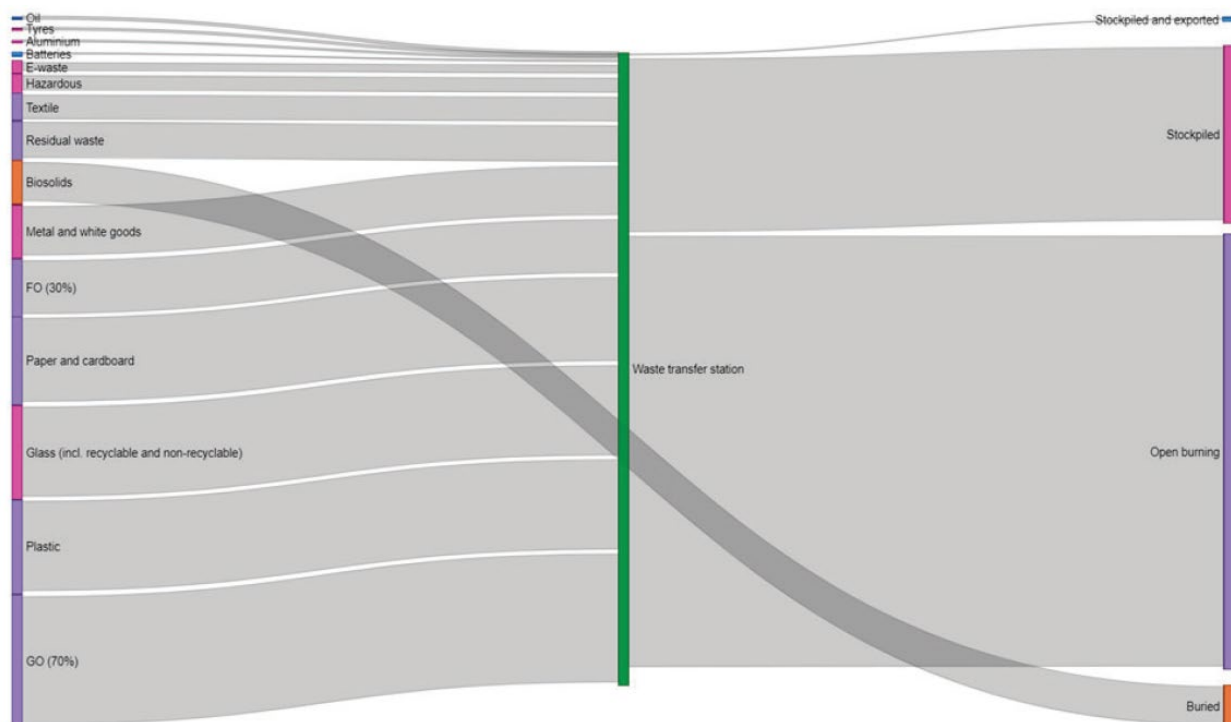


Figure 6: Waste flows West Island



## 2.3 Strategic Alignment

There are several Government strategies, policies, and commitments that clearly align to the nature, problems, and intended benefits of this Project. This is also true for several Commonwealth Government policies and priorities.

The following section provides a summary of the key strategic drivers fundamental to development of the Strategy.

### 2.3.1 Indian Ocean Territories Alignment

#### **Cocos (Keeling) Islands 2030 Strategic Plan (Strategic Plan)<sup>7</sup>.**

During 2018/19 the Indian Ocean Territories Regional Development Organisation, the Administrator of the Cocos (Keeling) Island, in consultation with the Shire of Cocos (Keeling) Islands undertook an extensive engagement, review and planning process to gain feedback and insights from key stakeholders to drive the development of Our Cocos (Keeling) Islands 2030 Strategic Plan (Strategic Plan).

<sup>7</sup> IOTRDOA 2019, 'Our Cocos (Keeling) Islands 2030 Strategic Plan', [Our Cocos \(Keeling\) Islands – 2030 Strategic Plan \(March 2019\) produced by the Indian Ocean Territories Regional Development Organisation \(RDO\) | Department of Infrastructure, Transport, Regional Development, Communications and the Arts](#)



The Waste and Resource Recovery Facilities Project meets a practical set of actions developed to assist CKI in delivering a sustainable future that unifies the community, diversifies the economic base and enhances the natural and cultural environment.

The project aligns with the following actions:

- MP3.18 - Reconfiguration of the waste centre to avoid ocean impact, and inclusion of recycling.
- MP3.48 - Establishment of a composting facility (at the waste centre) and better use/ expansion of the horticultural precinct, including an area for individual allotments.
- MP3.15 - Reconfiguration of the retail precinct/settlement core to create a focal space and better sense of arrival, with a visitor/interpretative centre as the first thing visitors come to.
- E6.2 - Investigate innovative ways of removing asbestos waste and implement these measures.
- E1.22 - Improve waste management practices; Prepare a Best Practice Waste Strategy for the IOTs aimed at achieving the goals included in the Plan. Include Waste Avoidance, Waste Reduction, Waste Recycling, Waste Management, and initiatives that have positive impacts globally.

In addition, the project will contribute and strengthen the realisation of the following key elements of the Strategic Plan.

### **Our Vision at 2030**

- *The built environment is well maintained and complements the aesthetic of the Islands' natural beauty.*
- *Our amazing pristine environment remains highly valued by all that live and visit the Islands and is a showcase to the world of why we are an Australian Paradise. To strengthen our environment, we are implementing an IOT Waste Management Strategy that is an exemplar for Island communities and tackles not only locally produced waste, but also global issues. The Green Economy is in full swing with the majority of our energy requirements being met from renewable sources.*

### **Our Values**

- *We value diversity and sustainable projects that provide employment opportunities for us and our future generations. We are keen to see more home-grown opportunities in key industry sectors.*
- *We value the pristine nature of our environment. We know it makes us an Australian Paradise. Our actions will ensure that all Islanders, visitors, and industries respect, appreciate and sustainably support it.*

### **Our Themes**

- *Our community: A well-educated community; A healthy community; Social harmony; Affordable housing; Safe and secure Islands; Community infrastructure.*
- *Our business: Profitable small business sector; Thriving tourism industry; Full employment; On-island food production.*
- *Our connections: Muslim-friendly tourism; Cost-effective shipping; Cost-effective air services.*
- *Our environment: Green energy; Best practice waste management; Protecting our pristine*

*environment; A well maintained built environment.*

- *Our governance: CKI Master Plan; Transparent government services.*

### **Shires Strategic Community Plan, 2022**

The Waste and Resource Recovery Facilities Project was identified further through the development of the Shires Strategic Community Plan in 2022 which committed:

*'To advocate to the Australian Government for opportunities for removal of waste from the island. To lead the development of opportunities for reuse and recycling throughout the Shire ...'*

### **Indian Ocean Territories Waste Management Strategy, DITRDCA, 2022**

In 2023 the project was further developed by the Australian Government's Department of Infrastructure, Transport, Regional Development and Communications and the Arts (DITRDCA) with the completion of the Indian Ocean Territories Waste Management Strategy.

The Strategy's overriding objective is to provide consistency with broader Australian Government objectives; specifically, the National Waste Policy Action Plan 2019, and alignment with local aspirations for the waste and resource recovery sector. The Strategy for the IOT seeks to build on what the IOT communities are currently doing to manage waste resources and focus on changes that could achieve the greatest benefits in terms of resource recovery, economic production, and environmental amenity.

The Strategy has also been developed towards:

- Supporting waste management activities with practical, effective, and enforceable solutions
- Improved waste management ownership and control, infrastructure supporting sustainable operation and maintenance.
- Making waste management systems and programs financially self-sustaining.
- Delineating and improving understanding of waste management responsibilities.
- Developing skilled and trained people within the IOT to effectively manage waste.
- Reducing the amount of waste generated at source and residual waste landfilled.
- Introducing and enhancing community participation in more sustainable waste management.

The IOT Waste Strategy identifies the following as short-term high priority actions:

- ID 4.3 Tender and allocate funding for appropriately specified incinerators to be established within CKI on West and Home Islands.
- ID 3.0 Develop interim storage areas to facilitate the appropriate storage of recyclables while exportation opportunities are being explored.
- ID 3.1 Upgrade existing transfer stations on CKI.

### 2.3.2 National and State Alignment

National, state, and region-specific legislative and regulatory frameworks act as strategic drivers for waste management, including waste avoidance, waste minimisation and resource recovery. Detailed discussion of strategic drivers including national, state, and local strategic framework, regulations and legislation are included in the Review of Current Waste Management Status in the Indian Ocean Territories Report (GHD, 2022).

#### **National Waste Policy and Action Plan, 2019**

The 2018 National Waste Policy (the Policy): Less waste, more resources provide a nationally recognised framework for action by governments, businesses, waste and resource recovery industries and communities to achieve sustainable waste management. The National Waste Policy Action Plan (2019)<sup>8</sup> sets out targets and actions for implementing the Policy. An annexure of the action plan was released in 2022 which provides an update to the action items in the Plan<sup>9</sup>.

The Policy and its associated action plan are underpinned by the waste management hierarchy and circular economy principles (Figure 2.1), which provide preferred decision-making guidance. The waste hierarchy preferences waste avoidance, minimisation, reuse, recycling and energy recovery over treatment and disposal.

*Figure 7: Waste hierarchy and Circular Economy principles*



Circular economy principles represent a shift from a linear take-make-use-dispose approach towards a circular system and product cycle whereby products and materials are kept circulating within the economy at their highest value for as long as possible, through reuse, recycling, remanufacturing, delivering products as services, and sharing of resources. These circular economy principles, in combination with the waste hierarchy, underpin the IOT Waste Strategy.

<sup>8</sup> Australian Government 2019, 'National Waste Policy Action Plan 2019', available from: <https://www.dcceew.gov.au/environment/protection/waste/publications/national-waste-policy-action-plan>

<sup>9</sup> Australian Government 2019, 'National Waste Policy Action Plan Annexure 2022', available from: <https://www.dcceew.gov.au/environment/protection/waste/publications/national-waste-policy-action-plan>

As a foundational guideline for developing the IOT's future strategic targets, relevant targets from the National Action Plan and other national strategic targets for Australia have been considered with respect to waste management in the IOT. The targets identified as relevant to the IOT are considered in Table 1 below.

*Table 1: Strategic Waste and Resource Recovery Targets*

Item	National targets	Relevance to IOT
1	Reduce total waste generated in Australia by 10% per person by 2030	Appropriate implementation of the Strategy can contribute significantly to reducing total waste generated.

Item	National targets	Relevance to IOT
2	80% average resource recovery rate from all waste streams following the waste hierarchy by 2030	This will be a difficult target given the current waste management practices, remoteness/isolation, logistical and infrastructure constraints.
3	Significantly increase the use of recycled content by governments and industry	Government departments, agencies, and councils in the IOT, as well as associated industries, can develop and implement sustainable procurement policies and purchasing protocols.
4	Phase out problematic and unnecessary plastics by 2025	Although the timeframe may not be achievable for the IOT, significant progress can be made through collaboration with stakeholders and effective implementation of the Strategy. Strong support from local businesses and communities would also be needed.
5	Halve the amount of organic waste sent to landfill by 2030	Organic waste makes up a large proportion of the IOT's waste stream.  (as discussed in Section 3.2).
6	Make comprehensive, economy-wide, and timely data publicly available to support better consumer, investment, and policy decisions	An achievable target which has been incorporated into the Strategy.

### **Waste Avoidance and Resource Recovery Strategy 2030 and Action Plan (WA)<sup>10</sup>**

The WA Waste Avoidance and Resource Recovery Strategy 2030 and associated Action Plan provide strategies for transitioning to a sustainable, low-waste, circular economy in which human health and the environment are protected from the impacts of waste. The primary objectives of the strategy align with the National Waste Policy. The WA strategy's overarching aim is to reduce the State's reliance on landfills.

These principles have been used to guide the development of key recommendations for the IOT Strategy.

<sup>10</sup> [Waste Avoidance and Resource Recovery Strategy 2030 | Waste Authority WA](#)

## 3 INVESTMENT PROPOSAL

### 3.1 Problem Statement

The Cocos (Keeling) Islands lack proper waste management infrastructure, resulting in environmental pollution, health risks, and a negative impact on the islands' natural beauty. The current practices are not aligned with national waste management targets and do not support the sustainable development goals of the islands.

There is both strong supporting evidence and community sentiment to improve waste management practices in the CKIs.

### 3.2 Investment Objectives

The Waste and Resource Recovery Facilities project has been established with three key investment objectives:

1. Provide a waste and resource recovery solution that enhances amenity and liability, minimises environmental and social impacts, and enables the transition to a circular economy that encourage and promote waste management and minimisation activities.
2. Safely dispose or residual waste from residential and commercial operators, alongside tackling legacy and non-municipal waste, in keeping with best practice and alignment with national waste management targets.
3. Be a cost-effective waste management solution.

### 3.3 Benefits

The Shire of Cocos (Keeling) Islands proposed Waste and Resource Recovery Facilities is expected to provide significant and tangible benefits benefit the local economy, the community, and the environment both during and post construction. The project will meet significantly enhanced liveability and quality of life on CKI. These benefits include but are not limited to:

- **Improve Waste Management:** Establishing Waste and Resource Recovery Facilities will enable proper waste segregation, recycling, and disposal, leading to improved waste management practices on the islands.
- **Reduce Environmental Impact:** Th project will significantly reduce the environmental impact of waste management on the islands, improve environmental outcomes, and promote best practice waste management infrastructure and processes. By implementing sustainable waste management practices, the project aims to minimise environmental pollution, protect the islands' unique ecosystem, and preserve the natural beauty of the Cocos (Keeling) Islands.
- **Enhance Public Health and Safety:** The project will contribute to the improvement of public health and safety by reducing the risks associated with improper waste disposal, such as air and water pollution, and the spread of diseases. This includes a reduction of hazardous material acting as missiles during cyclonic activity which pose a sever risk to life and property.

- **Promote Sustainable Development:** The Waste and Resource Recovery Facilities will support the sustainable development goals of the islands by promoting circular economy principles, reduce waste generation, increase the reuse of material on island and increase recycling of materials.
- **Economic Benefits:** The project will create employment opportunities in waste management services, increase skills development for the local population, including opportunities for volunteering. Moreover, it will contribute to the islands' reputation as a sustainable and environmentally conscious tourist destination.

Table 2: Benefit Register – Direct Benefits, Metrics and Targets

Benefit #	Benefit	Measure	Baseline	Target
1	Increased Employment	Persons employed in CKI waste management services	2	6
2	Eliminate environmental impact of waste disposed on island	Volume of waste buried on Cocos Keeling Islands	150T ash buried on CKI	0
3	Increased reuse of materials on island	Volume of waste reused on Cocos Keeling Island	0	50T
4	Recycling of materials	Volume of materials removed from the waste stream for recycling on mainland	30T	150T
6	Improved environment waste management practices	Stakeholder feedback during annual survey	Negative	Positive average
7	Volunteering Benefits	Hours of volunteering at the facility	0	15 total volunteer hours per week by 2025
8	Skills and knowledge development	Training delivered at the facility to increase community awareness of waste management.	0	Two open days per year plus school initiatives

## 4 STRATEGIC OPTIONS IDENTIFICATION AND ANALYSIS

### 4.1 Options Development

The options development drew the analysis from the IOT Waste and Resource Recovery Strategy, which identified the measures most feasible on CKI through a multi-criteria analysis (MCA). The documents examined context-appropriate general waste management and resource recovery options for the SoCI and SoCKI and the entire IOT region and across Service arrangement, RRF, Processing and residual waste disposal (as seen in appendix 1).

For the purpose, of this project the options being discussed refer that of CKI and to Resource Recovery Facilities (RRF) and residual waste disposal.

To note, limited scenarios have been identified that are practicable and readily available due to isolation, limited disposal options and limited available resources.

#### **Base Case / Business as Usual**

No changes to the current situation would be made.

OR

#### **Resource Recovery Facility (RRF)**

Two RRF options were considered for future enhanced arrangements for recycling and resource recovery for CKI. Based upon the two options considered, being:

- **Option 1:** Transshipment of recyclable materials and non-combustible residual waste via CI for aggregation and subsequent shipping to downstream processors in Singapore or Perth, and/or disposal to landfill on CI respectively; or
- **Option 2:** Upgrade existing / build resource recovery transfer station/s on CKI, including upgrading the existing transfer stations on both Home Island and West Island.

#### **Residual waste disposable**

Two options for residual waste disposal were assessed for CKI, being:

- **Option 1:** Construction of two small scale incinerators, or
- **Option 2:** Transportation off island for consolidation/disposal on CI.



## 4.2 Multi Criteria Analysis

To understand viable options for the CKI in the context of general waste management options, high-level matrices were developed, and an MCA screening assessment were undertaken within the IOT Waste and Resource Recovery Strategy (DITRDCA, 2022) and General Waste Management Report (GHD, 2022), both found within the supplementary attachments.

The waste management options were evaluated via MCA which focused on six (6) categories scored on a scale of 1-5. Each carrying differing levels of importance for DITRDCA. Below are the categories and associated weightings:

1. Technical performance – 20%
2. Operational requirements – 20%
3. Risk, Health, and Safety – 10%
4. Sustainability and legislative drivers – 15%
5. Social benefits – 10%
6. Economic feasibility – 25%

The full MCA assessment can be found in Appendix 1, please note that the original assessment considered both Christmas Island's (CI) and CKI's waste strategy, respectively. For the purpose of this business case and context CKI has been the focus.

*Table 3: Raw and Weighted Options MCA Results*

	Resource Recovery Facility (RRF)				Residual Waste			
	1. IOT RRF hub on CI		2. Upgrade existing recovery transfer station/s on CKI		1. Two small scale incinerators for each of the main Islands		2. Transportation off island for consolidation to CI	
	Raw Score	Weighted Score	Raw Score	Weighted Score	Raw Score	Weighted Score	Raw Score	Weighted Score
<b>Technical maturity and practicality</b>	3	12	4	16	3	12	2	8
<b>Operational requirement</b>	2	8	5	20	2	8	1	4
<b>Environmental and strategic drivers</b>	2	6	5	15	3	9	3	9
<b>Risk health and safety</b>	3	6	5	10	3	6	3	6
<b>Socioeconomic considerations</b>	3	6	3	6	4	8	4	8
<b>Financial feasibility</b>	2	10	3	15	2	10	1	5
<b>Total</b>	15	48	25	82	17	53	14	40



Figure 8: MCA Results - RRF

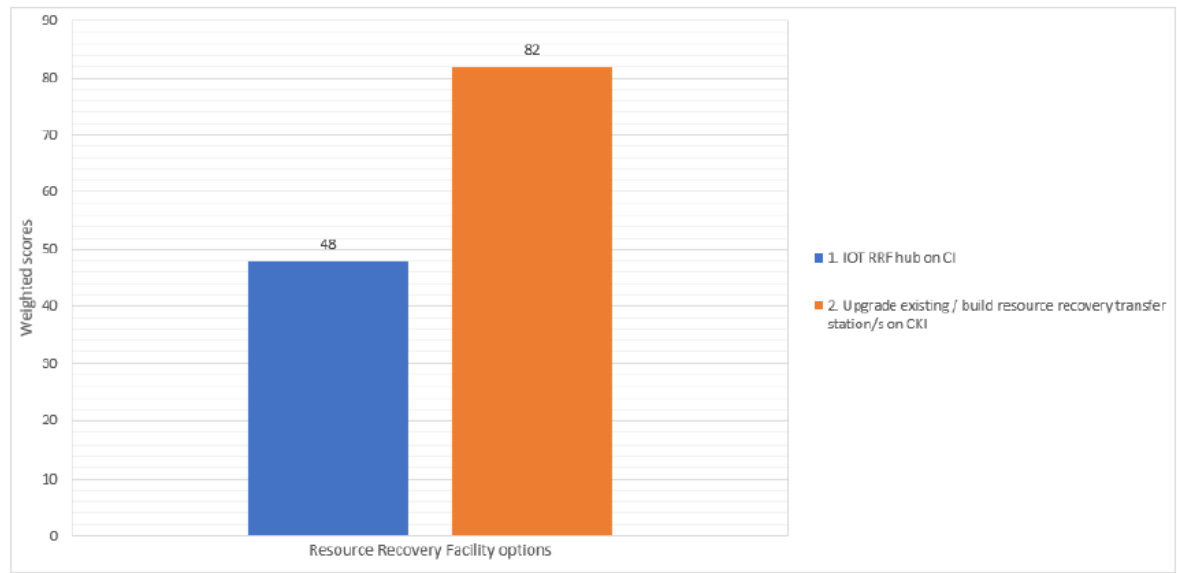
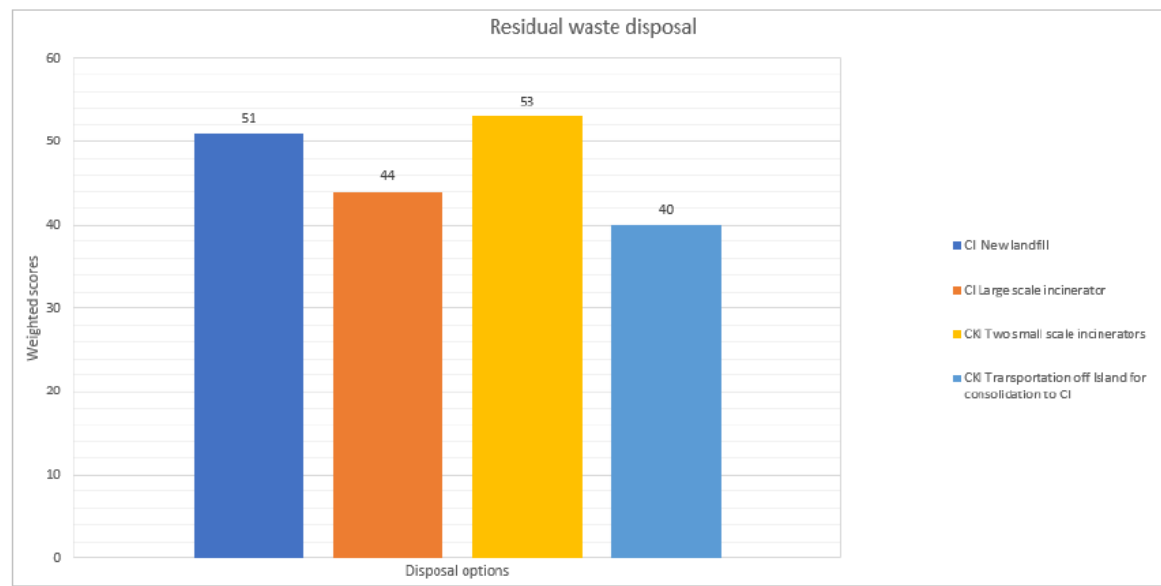


Figure 9: MCA Results - Residual Waste Disposal



## 4.3 Preferred Options

### Resource Recovery Facility (RRF)

**Option 2:** Upgrade existing / build resource recovery transfer station/s on CKI, including upgrading the existing transfer stations on both Home Island and West Island.

Option 2, to upgrade CKI's existing transfer stations, was found to be the preferred option, particularly as CKI already has transfer stations that can be used as, or enhanced with, integrated RRF's. These would require upgrading to facilitate a higher resource recovery rate and to support processing options that may be implemented within CKI. Furthermore, this option is the only readily available scenario due to the remoteness of the islands, limited disposal options and the limited resources available. From the 1 July 2023, SoCKI implemented a new gate fee structure for the acceptance and management of certain items at the WTSS. The proposed gate fees are intended to ultimately incorporate full cost recovery for management of waste that the SoCKI WTSS are not licenced to receive, and for waste requiring off-island disposal.

### Residual waste disposable

**Option 1:** Construction of two small-scale incinerators

Option 1, of the construction of two small-scale incinerators<sup>11</sup>, one on West Island and another on Home Island, was found to be the preferred option. A key constraint for Option 2 is that currently, the shipping and airline companies only allow some hazardous waste types to be transported, and shipping between the islands does not currently occur on a reliably scheduled basis, often impacted by weather-related delays (swell, tropical storms etc). A more sophisticated intermodal waste transfer facility would need to be established at both CKI (for export) and CI (for import). Odour and quarantine/biosecurity concerns would also need to be managed. This logistical challenge would need to be resolved for transportation off-island to become feasible.

Furthermore, the ongoing cost for CI to receive, process, recover recyclables and/or dispose of waste, in addition to the high cost of transportation of waste to CI would be significant. This would be a significant financial burden for SoCKI (and/or the Commonwealth) to support long term. It is also noted that the fee charged for management and disposal of waste at CI would be at the discretion of SoCI (and/or the Commonwealth – depending on commercial model and funding arrangements). As such, it is considered unlikely that shipping residual waste from CKI to CI would be a satisfactory management option.

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<sup>11</sup> It has been discussed by the Shire and the IOT Waste Strategy that given the small scale of the incinerators, energy recovery is not viable nor cost effective. Moreover, the planned incinerators will require supplementary fuel (diesel) to achieve and maintain combustion temperature for emissions compliance.

## 5 PREFERRED OPTION

### 5.1 Preferred Option Summary

- Upgrade to existing resource and recovery transfer station on CKI
- Two small-scale incinerators (each on West Island and Home Island respectively)

#### 5.1.1 Scope of Works

The scope of works includes the development of waste management infrastructure at the transfer stations on both Home Island and West Island. This includes but not necessarily limited to the establishment on both islands of:

- **Upgrade of existing transfer stations and storage areas for processing of recycling and storage in preparation for off island disposal:**
  - o Design, construction, and certification of the new waste transfer shed
  - o Ancillary roadworks package including electrical, security and water feeds to the site.
  - o Bulk earthworks and platform construction
  - o Structural steelwork, roofing, and cladding
  - o Piling works
  - o Structural concrete works
  - o Stand-alone canopy works
  - o Precast concrete push-up walls as required to the perimeter of the new WTS
  - o Upgrade to existing washdown bay treatment facilities
  - o Internal roadways pavements etc.
- **Two small-scale incinerators (each on West Island and Home Island respectively)**
  - o Fully insulated chamber to retain heat and improve combustion
  - o Rapid, complete, and efficient waste disposal
  - o Patented safety handle for easy access to chamber
  - o High quality refractory lining and insulation
  - o Easy to use CE7 control panel
  - o Programmable temperature control for complete combustion
  - o Secondary chamber\* with 2 second retention time
  - o Fast pre-heat and continual high temperature performance
  - o Low energy consumption levels

Table 4 below describes a brief description of the scope of works for this project.

An indicative site layout is illustrated in Figure 10, Figure 11, and Figure 12, with the incinerator in Figure 13.

The works will be Tendered as one project.

*Table 4: Scope of Works and Description*

Preliminaries & Site Establishment	Establish building site, existing perimeter fence and gates to remain.  Rubbish removal for the duration of the build.  All workers prior to attending site to complete Contractors Induction. (20min to complete).
Project Management & Shop Drawings	Project Management and site supervision for the duration of the project.
Equipment Hire	Access equipment to complete all works in a safe manner.
Demolition Relocation	Remove identified materials and relocate.  NAWMA will remove the existing steel bins from site or relocate to appropriate position on site for rubbish and spoil removal.
Civil and Stormwater	Re shaping and subbase preparation for new bitumen and concrete pavement area.  New, bollards, bitumen works, traffic island modifications works.  Full Civil scope as per the drawing sets.
Concrete	Pour new concrete slabs, concrete Push Walls to all areas shown
Precast Concrete	Concrete barriers to be supplied and installed.
Incinerators install	Contractor to manage freight and installation and commissioning of incinerators.
Fire Services	A new water supply service to be installed to each transfer station.
Landscaping	By CKI Shire.

## **Indicative Site Layout**

Figures 10 and 11 illustrate the indicative sit layout of the proposed Resources and recovery facilities subject to DWER approvals. The sites will be mirrored on each Home and West Island, respectively.

*Figure 10: Indicative Site Layout - Home Island*



*Figure 11: Indicative site Layout - West Island*



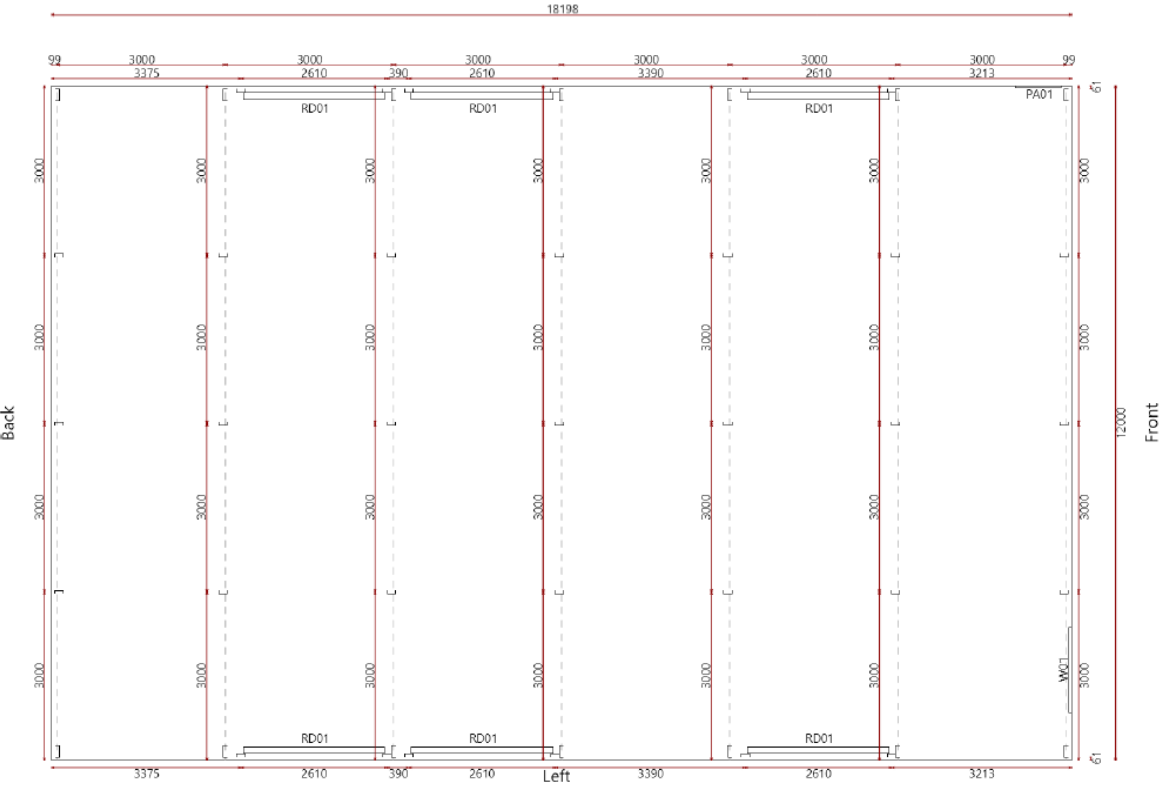


**Recycling Shed – Design and Layout**

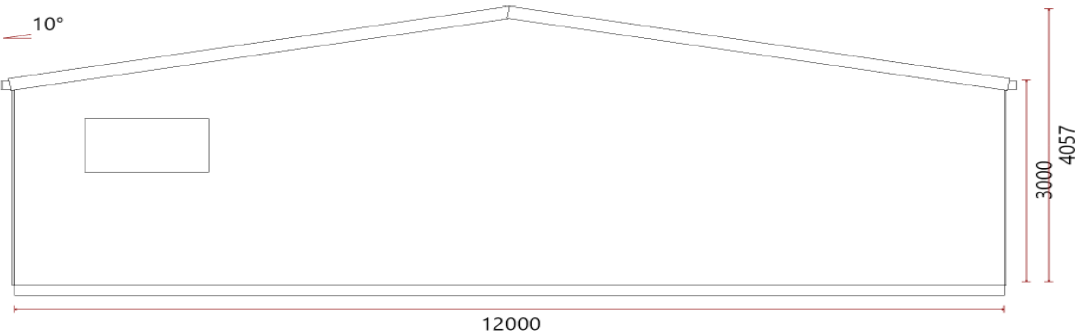
*Figure 12: Recycling shed – Design and Layout*



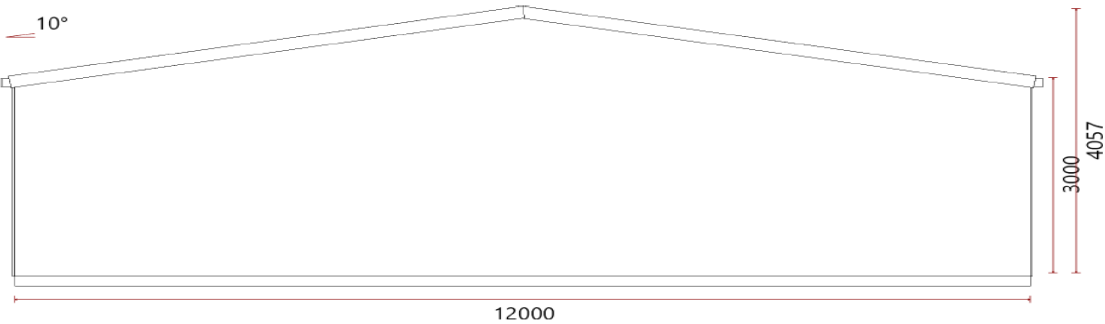
**Plan**



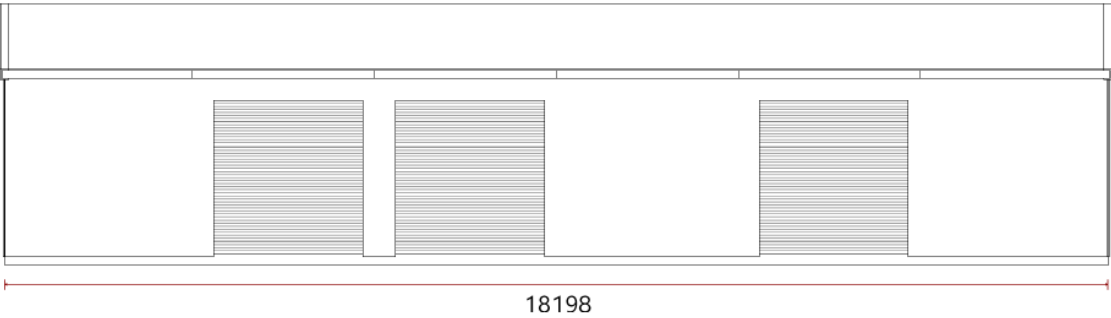
Front Elevation



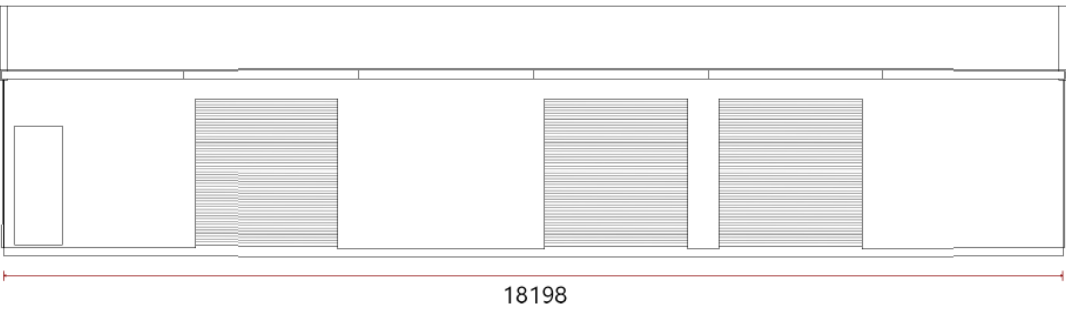
Back Elevation



Left Elevation

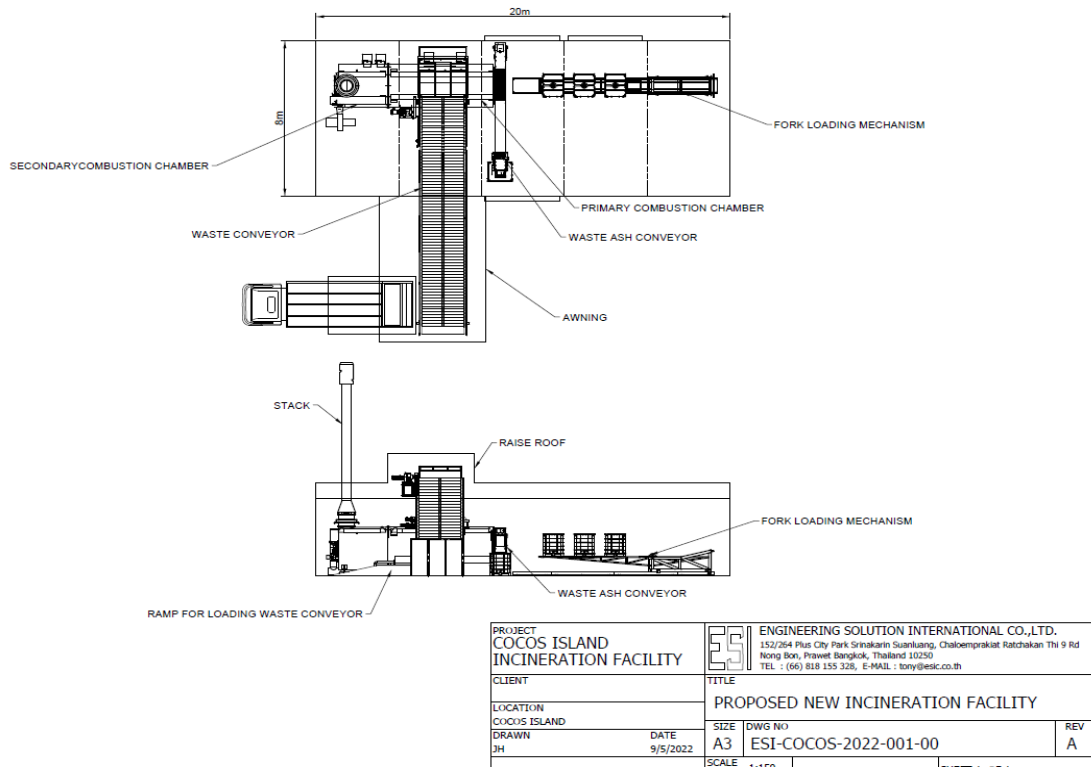


Right Elevation



**Incinerator Layout**

Figure 13: Incinerator Layout



**5.1.2 Budget**

The total projected project cost is \$5,328,000.

The Shire of Cocos (Keeling) Islands is classified as a group 1 applicant given its classification of a 'Very Remote' location, and as such is eligible for 90% of the project costs. However, for this application, the Shire of Cocos (Keeling) Islands is seeking 100% of the funding and is seeking a full exception of any contribution requirements.

The request for this exemption is driven by the exceptional circumstances of the Shire from the immediate need for the project to occur, the high remoteness of the Shire and Community, issues on waste legacy, ownership and the Commonwealth's refusal to pay waste fees and charges for the 2023/24 financial year, alongside the Shire's limiting operating budget and having no way to raise additional revenue for its budget.

The Shire and community will contribute to the project by providing additional in-kind support. The Shire's in-kind support is provided through the provision of project oversight, via the Project Steering Committee and the Community Development Coordinator will provide project communications and engagement for the duration of the project.

Letters of support for the project have been provided from the Regional Development Organisation to demonstrate support for the project (as attached in supplementary documentation).



Once the project is complete, the ongoing maintenance and management of the Project Facilities will continue to be the responsibility of the Shire of Cocos (Keeling) Islands as the asset manager. The Shire is already responsible for, and budgets accordingly, the management of the waste infrastructure under its current asset management plan, and this will continue following the redevelopment.

All costs have been calculated based on quotes received, estimates identified in the IOT Waste Strategy or based on on-island staff extensive experience and expertise in delivering projects of this scale and nature.

The expenditure for the project has been split across the three-year life of the works with the significant portion occurring in the 24/25 financial year. This is reflective of the intent to procure and commence shipment of materials to the island as a priority. Materials and contractors form the bulk of the expenditure.

All figures are shown in AUD (\$).

*Table 5: Project Costs and Budgets*

<b>Expenditure Item</b>	<b>FY 23/24</b>	<b>FY 24/25</b>	<b>FY 25/26</b>	<b>Total</b>
Materials	20,000	1,600,000	1,000,000	2,620,000
Hired Plant	10,000	180,000	50,000	240,000
Contractor	25,000	800,000	425,000	1,250,000
External Labour	10,000	200,000	80,000	290,000
<b>Total Project Costs</b>	<b>65,000</b>	<b>2,780,000</b>	<b>1,555,000</b>	<b>4,400,000</b>
Project Management (12%)				528,000
Administration (10%)				400,000
<b>Total Costs</b>				<b>5,328,000</b>

	Home Island (\$)	West Island (\$)	Total (\$)
<b>Recycling Shed</b>			
Materials (inc. freight)	125000	125000	250000
Hired Plant	35000	35000	70000
Contractor	150000	150000	300000
External Labour	60000	60000	120000
<b>Incinerators (inc floor and shed)</b>			
Materials (inc. freight)	1100000	1100000	2200000
Hired Plant	50000	50000	100000
Contractor	350000	350000	700000
External Labour	25000	25000	50000
<b>Hardstand Areas (inc roads and drainage)</b>			
Materials (inc. freight)	85000	85000	170000
Hired Plant	35000	35000	70000
Contractor	125000	125000	250000
External Labour	60000	60000	120000
	<b>TOTAL PROJECT COSTS</b>		<b>4,400,000</b>
Project Management (12%)			528,000
Administration (10%)			400,000
		<b>TOTAL</b>	<b>5,328,000</b>

## 5.2 Social and Environmental Impact Analysis

Further effort will need to be made to understand the social and environmental impacts. Given the scale of the proposed project, the Shire has been advised that an Environmental Impact Assessment may not be required. However, it may be required to seek a Works Approvals application with supporting document. Environmental approval should be sought through Part V of the Western Australia Environmental Protections Act.

## 5.3 Economic Analysis

In order to understand the economic impact of the project, a Cost-Benefit Analysis (CBA) was undertaken to monetise the costs and benefits of the project.

### 5.3.1 Methodology and approach

An economic analysis was undertaken for the options based on a CBA framework. The CBA considers benefits accruing against the costs associated with each option, calculating a BCR to assist in assessing the economic viability of the options.

A CBA was used to monetise the benefits and costs (where possible), and discounting to present value benefits and costs, to provide a basis for direct comparison (where relevant) between the options and base case.

Figure 14 illustrates the CBA methodology used, comparing the options to the base case to determine the incremental impact of the options.

Figure 14 CBA Methodology



The CBAs were undertaken to calculate the following summary results:

**NPV** – the present value of net future cash flows can be used to indicate improvement in economic efficiency from the base case. A positive NPV indicates the project will have a net economic benefit; the higher the NPV, the higher the net economic benefit.

**BCR** – the present value of benefits divided by the present value of costs (including operating costs). This can be used as a decision tool and to rank initiatives. A BCR greater than one suggests that the present value of the monetised benefits outweighs the present value of costs.

### 5.3.2 Assumptions

Economic analyses were conducted for the selected options. Table 6 outlines the key parameters used for this assessment.

Table 6: Key parameters and assumptions

Parameter	Assumption	Source / rationale
<b>Key parameters</b>		
Evaluation start	2023-24 FY	As per schedule
Construction period	2023-24 FY to 2025-26 FY	As per project cost breakdowns above
Operation period	20 years	Assumed 20-year life of the asset
Evaluation period	23 years	Construction period plus operational period

Parameter	Assumption	Source / rationale
Price year	December 2023 (i.e. values in prior years will be inflated to December 2023 dollars)	Latest available Bureau of Statistics' Consumer Price Index data
Discount rate	7% (4% and 10% sensitivity analysis scenarios)	As per CBA guidelines
<b>Capital cost assumptions</b>		
Capital cost estimates	\$5,328,000	As per project cost estimates above
<b>Operating cost assumptions</b>		
Annual diesel used for OPEX	150,000L	Assumed average weekly diesel requirements of 1,500L/week of diesel per incinerator
Price of diesel	\$2.50	Assumed average price of diesel
<b>Waste assumptions</b>		
Total general waste (FY23)	827.96 tonnes	Comprised of 376.4 tonnes of general waste from the transfer station, 450.54 tonnes of waste via truck pickup and 1.0168 tonnes of marine debris waste collected from Sea Shepherd.
Annual growth in waste	1.00%	Assumed average annual growth in waste volume
Residual ash from incineration	10%	Assumed 10% of total waste to remain post incineration in the form of ash
<b>Transport assumptions</b>		
Weight of a 20ft shipping container	2.5 tonnes	Assumed weight of a 20ft shipping container
Weight of general waste inside a shipping container	17 tonnes	Assumed total weight which can be loaded into a shipping container, based on crane limits on Home Island
Cost of a shipping container	\$7,500	Assumed cost of a 20ft shipping container
Shipping Cost	\$20,000	Assumed shipping costs to Mainland, based on historic shipping rates
Road transport costs	\$1,250	Assumed transport costs, including \$600 transport costs within the Shire of Cocos Keeling Islands, and \$650 on the Mainland
<b>Disposal assumptions</b>		
Cost of waste disposal on the mainland	\$210(ex. GST) per tonne	Based on disposal costs for low level hazardous (assumed class 3) waste (ash) per tonne

Real December 2023 dollars (Dec-23\$) were used for this assessment.

### 5.3.3 Monetised costs and benefits

The table below outlines the monetised costs and benefits included in this cost benefit analysis.

*Table 7: Monetised costs and benefits*

Monetised item	Overview of the item
<b>Costs</b>	
Capital costs	The construction cost of the project, including project management costs and administration costs.
Operating costs of incineration	Operating costs of the incinerator, based off the annual total volume of diesel required to run the incinerator and the price of diesel.
Transport of residual waste to landfill	The transport costs of residual waste (ash) post incineration to the mainland. This is made up of the residual ash amount from the total waste generated post incineration. These transport costs include both shipping costs and road transport costs.
Disposal of residual waste on the mainland	The disposal of residual waste (ash) post incineration on the mainland. These disposal costs are based off the total residual waste tonnage and waste disposal fees on the mainland.
<b>Benefits</b>	
Decreased transport cost of waste to landfill	This benefit outlines the decreased transport cost of bulk waste to the mainland. Given that without the project occurring, all general waste would be required to be shipped and disposed of on the mainland. This benefit is based off the total waste generated, with the transport costs include both shipping costs and road transport costs of all raw general waste from the Shire.
Decreased disposal cost of waste on the mainland	This benefit outlines the decreased disposal cost of the bulk raw waste on the mainland. These disposal costs are based off the total raw general waste tonnage and waste disposal fees on the mainland.

### 5.3.4 Results

Based on the modelled assumptions outlined above, Table 8 below outlines the results of the cost benefit analysis. Under the 7% discount rate, the project recorded a positive net present value of \$3.66 million and benefit cost ratio of 1.40 (where a benefit cost ratio higher than one results in the benefits outweighing the costs), indicating that for every \$1 spent on the project, it returns \$1.40 in benefits.

*Table 8: Cost benefit analysis results*

Component	4%	7%	10%
Net Present Costs	\$11,418,020	\$9,205,504	\$7,692,823
Net Present Benefits	\$18,128,442	\$12,863,262	\$9,465,631
Net Present Value	\$6,710,421	\$3,657,758	\$1,772,808
BCR	1.59	1.40	1.23

## 6 IMPLEMENTATION ANALYSIS

### 6.1 Procurement Strategy

A detailed procurement strategy can be found in the Project Management Plan.

All purchasing activities undertaken by the Shire of Cocos (Keeling) Islands are guided by the Purchasing Policy.

The objectives of the Policy are to:

- Ensure compliance with the Local Government Act (WA)(CKI) 1995 (the Act) and the Local Government Act (Functions and General) Regulations 1996 (the Regulations).
- Deliver a best practice approach and procedures to internal purchasing for the Shire of Cocos (Keeling) Islands.
- Ensure consistency for all purchasing activities that integrates within all the Shire of Cocos (Keeling) Islands operational areas.
- Ensure openness, transparency, fairness, and equity through the purchasing process to all potential suppliers.
- Undertake procurement processes that ensure value for money for the Shire of Cocos (Keeling) Islands by delivering the most advantageous outcome possible.
- Ensure compliance with the State Records Act 2000.

To ensure the selection process is fair and objective for all tender requests, the Shire observes the highest standards of integrity. The following principles, standards and behaviours are observed and enforced through all stages of the purchasing process to ensure the fair and equitable treatment of all parties:

- Full accountability shall be taken for all purchasing decisions and the efficient, effective, and proper expenditure of public monies based on achieving value for money.
- All purchasing practices shall comply with relevant legislation, regulations, and requirements consistent with the Shire's policies and code of conduct.
- Purchasing is to be undertaken on a competitive basis in which all potential suppliers are treated impartially, honestly, and consistently.
- All processes, evaluations and decisions shall be transparent, free from bias and fully documented in accordance with applicable policies and audit requirements.
- Any actual or perceived conflicts of interest are to be identified, disclosed, and appropriately managed.
- Any information provided to the Shire by a supplier shall be treated as commercial-in-confidence and should not be released unless authorised by the supplier or relevant legislation.

Consideration of the project and compliance with the Purchasing Policy is more important than obtaining the lowest price, particularly taking into account user requirements, suitability for the coastal environment, quality standards, sustainability, whole of life cycle costing, and service benchmarks.

An assessment of the best value for money outcome for any purchasing considers:

- All relevant whole-of-life costs and benefits.
- The technical merits of the goods or services being offered in terms of compliance with specifications, contractual terms and conditions and any relevant methods of assuring quality.
- Financial viability and capacity to supply without risk of default. (Competency of the prospective suppliers in terms of managerial and technical capabilities and compliance history).
- A strong element of competition in the allocation of orders or the awarding of contracts. This is achieved by obtaining a sufficient number of competitive quotations wherever practicable.

All procurement for the project will be managed by the CEO or their delegate. All procurements should be:

- Adequate and timely to ensure delivery of the project within the stated timelines.
- Quoted as per the Purchasing Policy and copies maintained in support of the requirement.
- Financially managed to a high standard, ensuring that the budget is adhered to as closely as practicable.
- Ensure that a contingency plan is developed to meet overruns in terms of cost, time and scope.

## 6.2 Risk Management

An initial risk analysis has been undertaken by the Shire specific to the project and based on the ISO31000:2009 guidelines. This will be regularly reviewed and updated throughout the project.

### 6.2.1 Risk Management Plan

The Risk Management Plan can be found in the Project Management Plan with the Risk Register found in Appendix 2.

The Risk Management Plan utilises the following risk matrix to determine the risk rating of an event.

Figure 15: Risk Matrix

Consequence Rating	<b>Catastrophic</b>	High	High	Very High	Extreme	Extreme	Extreme
	<b>Major</b>	Medium	Medium	High	Very High	Extreme	Extreme
	<b>Moderate</b>	Medium	Medium	High	High	Very High	Very High
	<b>Minor</b>	Low	Low	Medium	Medium	High	High
	<b>Insignificant</b>	Low	Low	Low	Medium	Medium	Medium
	<b>Likelihood Rating</b>	<b>Rare</b>	<b>Unlikely</b>	<b>Possible</b>	<b>Likely</b>	<b>Almost Certain</b>	<b>Occurring Now</b>

## 6.2.2 Risks and Mitigations

The key risks and mitigations have been identified in Table 9 below.

Table 9: Project Risks and Mitigations

Risk	Mitigation
<b>Project Management</b>	
<b>Securing construction contractor for project</b>	Wide advertising of tender. Briefings to local builders to encourage local tenders.
<b>Job approval process delays project progression</b>	Robust contract based on WALGA model. Delegations in place. Prioritised work with planners and Council.
<b>Project changes are made outside scope of original project design</b>	Contract establishes project governance. Project Management from experienced Management staff and contractors.
<b>Poorly defined project scope leading to insufficient funding and inability to access project resources</b>	Design process to include QS pricing checks relevant to Cocos Keeling Islands with brief to ensure can be completed within budget. Support from qualified and experienced staff.
<b>Site conditions do not meet expectations accounted for in project planning</b>	Experience in construction in Cocos Keeling Island environment a factor in tender selection. Reference checks of tenderers. Support from local Manager of Works and Services. Support and advice from Architect who has worked on CKI previously.
<b>Design error or planning fails to adequately address requirements,</b>	Shire of Dandaragan qualified planners and Building Surveyor engaged in planning process. Design and oversight support from experienced Architect. Design approved as per planning approval and building approval processes.
<b>Breakdown in client – contractor relationship</b>	Tender evaluation to include reference checks. Regular meetings between contractor Shire Staff and management.
<b>Damage or theft to site, equipment and tools</b>	Site Management Plan to ensure responsibility remains with contractor/management staff for site and material security. Contractor/ Shire management staff responsible for site and material security and general site presentation and insurance.
<b>Performance of construction contractors</b>	Robust Contract and project plan. Contractors to provide regular reporting on project progress against plan.
<b>Resource Availability</b>	



<b>Availability of construction materials</b>	Air or sea freight availability does not meet requirements.
<b>Unexpected increase in the cost of construction material</b>	Logistics of getting material to the island, and then storing the material once it arrives may impact how much can be delivered at any one time and therefore expose materials to price fluctuations.
<b>Quality of material impacted by high humidity</b>	Materials selected for construction not appropriate for ocean water or high humidity.
<b>Safety hazards that lead to worker accidents and injuries</b>	Inadequate safety training provided. Safety culture on-site does meet OSH legislative requirements.
<b>Financial</b>	
<b>Cash flow</b>	Cocos Keeling Islands to hold sufficient flexibility in cash flow reserves to account for timing differences.
<b>Payment of terms</b>	Any Contract with contractors to specify payment terms that Shire of CKI is able to meet. Payment delegations in place if CKI CEO absent for extended periods.
<b>Contractor comes under financial stress or insolvent</b>	Insurance Reference checking during tender process. Payment arrangement including payment in arrears to retain sufficient funds for CKI to complete works if necessary.
<b>Natural and Community Factors</b>	
<b>Adverse weather conditions impact project</b>	Insurance Timing of commencement of the project to account for seasonal weather risks. Project plan to include contingency for delays (time and money).
<b>Restricted access during wet season</b>	Project plan to include contingency in timelines. Unlikely to be more than a few days.
<b>Human Resources</b>	
<b>Availability of labour</b>	Priority project for the Shire. Shire has several qualified tradespeople (carpenter, builder, plumber) to supplement contractor labour if required. Contractor labour to be sought for specific jobs within the project.
<b>Cost of labour</b>	Advertise casual pool, retain current casual project staff, use of other Contractors on Island.
<b>Social Risk</b>	
<b>Community resistance to project</b>	Site is well away from residential area. Site Management Plan Dust Management Plan.

## 6.3 Assumptions Constraints Dependencies

### 6.3.1 Project Assumptions

The project will be managed by the Shire of Cocos (Keeling) Islands in consultation with any external contractors engaged to undertake the project implementation. This will ensure that the scope and methodology is adhered to and the project deliverables identified, within scope and budget.

The Project Management Plan (within the supplementary documents) may change as new information and issues are revealed. This will be managed through a continuous review process with the Project Sponsor, Project Manager and the Project Steering Committee as outlined in the project governance elements of this Project Plan.

The Infrastructure Manager together with the Community Development Coordinator will ensure that the Council and all stakeholders remain connected and updated with the Project progress and ensure a transparent and accountable process in the delivery of the Project, as per the Stakeholder Engagement Plan.

### 6.3.2 Project Constraints

The following represent known project constraints:

- Project funding is limited.
- Funding needs to be secured before the project can be implemented.
- Design and Construct tenders need to be at, or below allowable funding or changes will be required.
- Project construction needs to operate with the north-west monsoons from January to May, in mind.

### 6.3.3 Project Dependencies

The following represents known project dependencies:

- Achieving the project deliverables is reliant on the engagement of suitably qualified and experienced Architect, Project Manager and Building Contractor.
- The project methodology has identified the scope of works required and this works program relies on the engagement of contractors to complete the components of the project delivery.
- Logistics of getting material to the island, and then storing the material once it arrives may impact how much can be delivered at any one time.

### 6.3.4 Project Approvals

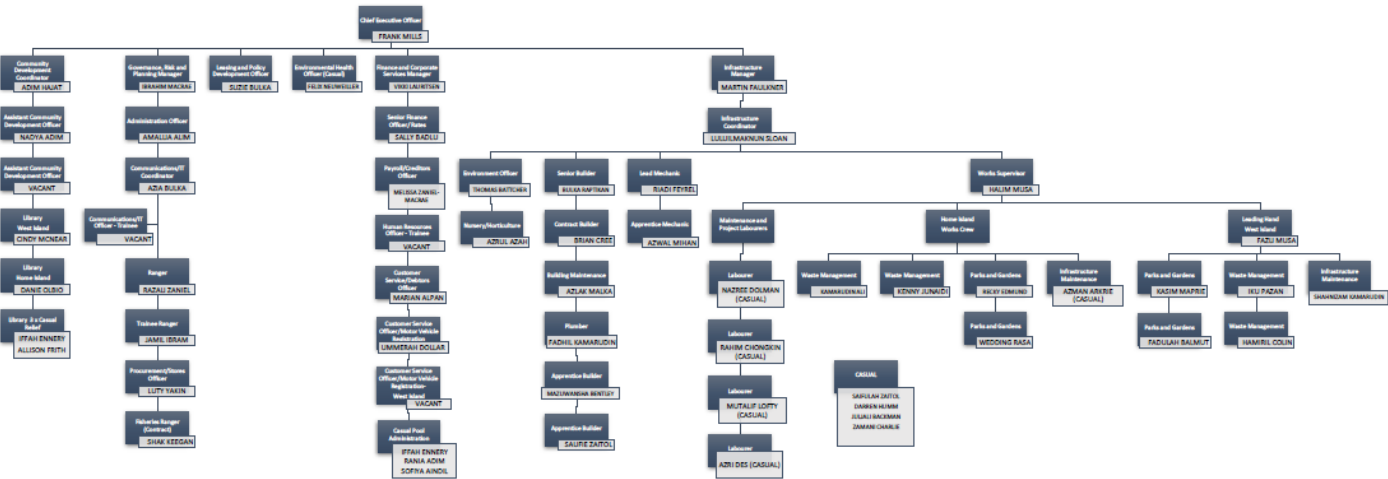
- The Project will not require development approval as per the Shire of Cocos (Keeling) Islands Town Planning Scheme No. 1 District Zoning Scheme 12. The Project will be delivered on the current sites.
- Quotes for individual elements have been sourced enabling Council to proceed with the project as soon as all funding is secured.
- Once all funding is secured for the project, the project will commence immediately with tenders called for the implementation of the project. The project can commence in line with the grant guideline start date of no later than the 15<sup>th</sup> of May 2024.

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<sup>12</sup> Shire of Cocos (Keeling) Islands. (2007). Shire of Cocos (Keeling) Islands Town Planning Scheme No. 1 District Zoning Scheme. Territory of Cocos (Keeling) Islands Government Gazette.  
<https://shire.cc/images/files/ShireofCocosKeelingIslandsTownPlanningSchemeNo1.pdf>

# 6.4 Governance Arrangements

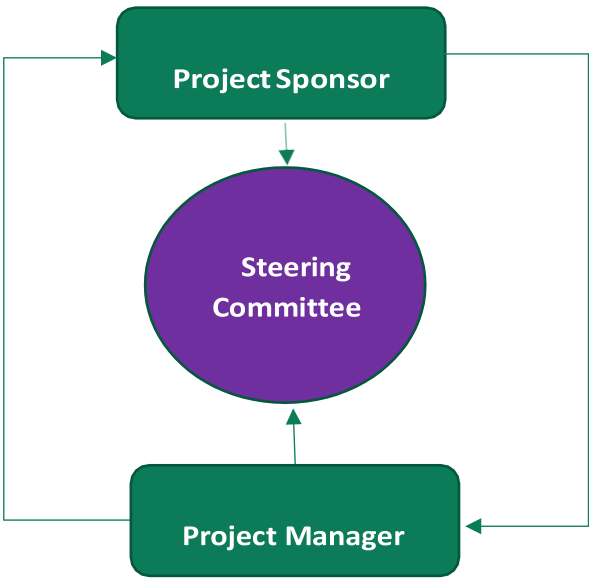
Figure 16: Shire of Cocos (Keeling) Islands Organisational Structure



## 6.4.1 Governance structure

The project will be governed by a Project Steering Committee, which will function as a supervisory board that is accountable for managing and addressing project issues, monitoring risks, quality, and project timelines.

Figure 17: Project Governance Structure



## 6.4.2 Roles and Responsibilities

### Project Steering Committee

- The steering Committee will consist of:
  - o Project Sponsor (CEO)
  - o Finance Manager
  - o Infrastructure Manager
  - o Project Manager and representative from Council.
  - o Contractors may be invited to be part of the Steering Committee if required.

It is anticipated that the Project Steering Committee, will meet on a fortnightly basis.

The Project Steering Committee will:

- Determine how the projects goals and objectives will be measured.
- Monitor project implementation and metrics.
- Approve rewarding of contracts.
- Act as point of escalation for any project deviation
- Approve any changes to scope.
- Ensure consistency among project and program governance.
- Manage interdependencies.
- Participate in Post Implementation Reviews following achievement of project milestones.

### Project Sponsor

- The Shire CEO will be appointed Project Sponsor to provide project oversight, accountability throughout the project, prioritisation of the project within the Shire and project champion within the community.

### Project Manager

- A Project Manager will be contracted to manage the project.
  - o The Project Manager will be responsible for:
  - o Leading project planning sessions.
  - o Coordinating contractors and project resources.
  - o Managing project progress and adapting work as required.
  - o Ensuring project meet deadlines.
  - o Managing relationships with Shire and stakeholders.

- Overseeing all incoming and outgoing project documentation.
- Participating in tender process i.e., design, submission, and review.
- Designing detailed Work Breakdown Structure.
- Conducting project review and creating detailed reports for Project Steering Committee.
- Optimising and improving processes and the overall approach where necessary.

The Project Sponsor and Project Manager will meet on a weekly basis. The Steering Committee can expect the Project Manager to objectively report to them on the status of the project, including any problems or issues that require their direction.

The Finance Manager together with the Project Manager will be responsible for all and any Project Progress Reporting required by funding partners throughout the duration of the project implementation and at the completion of the project.

Key personnel from Shire of Cocos (Keeling) Islands will be:

- **CEO, Frank Mills**

Frank has over 20 years' experience at an executive/senior management senior level, including two CEO roles, in regional and remote local governments, with a proven record of achievement in complex regional contexts.

- **Finance Manager, Vikki Lauritsen**

Vikki is a CPA qualified Accountant with a strong financial background. Vikki has used her leadership skills to develop outcomes-focused multidisciplinary teams that are engaged, resilient and accountable.

- **Infrastructure Manager, Martin Faulkner**

Martin has over 20 years' experience managing projects relating to improvements and construction of works, services, and assets for Councils throughout Australia.

## 6.5 Stakeholder Engagement

Stakeholder engagement and consultation will be key to the successful delivery of the Project. Continual engagement with stakeholders outside the immediate project team will continue to allow stakeholders to follow the Project's progress, develop a sense of shared ownership, and raise issues and concerns early.

### 6.5.1 Key Stakeholders

Table 10 is a non-exhaustive list illustrating the key stakeholders who will be directly and indirectly impacted by the project.

Table 10: Key Stakeholders List

Stakeholder	Interest	Level of Influence	Level of Interest
SoCKI	Responsible for the Project	High	High
Department of Infrastructure, Transport, Regional Development, Communications and the Arts (DITRDCA)	Infrastructure development	High	High
Department of Agriculture, Water and the Environment (Biosecurity Operations Division)	Environmental impact, biosecurity, and biodiversity conservation	Medium	High
WA Department of Water and Environmental Regulation (DWER).	Environmental regulator, compliance, and operating licensing	High	High
Department of Fire and Emergency Services (WA)	Shift from open burning practices to incinerator usage.	Medium	High
Home Island Community	Users of waste and recovery facilities	High	High
West Island Community	Users of waste and recovery facilities	High	High
Neighbouring Residents	Residents in neighbouring streets to facilities. Impacts associated with construction of project (noise, traffic etc.) Impacts associated with locality of the completed facilities (Noise, Odour etc.)	High	High
SoCKI	Indirectly impacted by success of waste management process and infrastructure	Medium	Medium
Local Businesses	Users of waste and recovery facilities	Medium	High
Tourism Operators	Users of waste and recovery facilities	Medium	High
Royal Australian Air Force (RAAF) base,	Users of waste and recovery facilities	Low	Medium
IOT Administration (IOTA)	Users of waste and recovery facilities	Low	Medium
IOT Health Services	Users of waste and recovery facilities	Low	Medium
Community Groups (list of 17 community groups including seniors and youth)	Users of waste and recovery facilities and impact on tourism.	Medium	High
Local Schools	Users of waste and recovery facilities, environmental and waste education	Medium	High
Waste Management Companies	Partnership opportunities and waste management expertise	Medium	High
Environmental organisations	Environmental impact and sustainability of the project and waste management practices	Medium	High
Research Institutions (University of Western Australia)	Waste management research	Low	Medium

## 6.5.2 Stakeholder Engagement to Date

The Project was initially conceptualised through the stakeholder engagement process for the development of the *Our Cocos (Keeling) Islands 2030 Strategic Plan (Strategic Plan)*. The consultation conducted for the Plan included consultation with representatives of all

key stakeholders and took a wider view of the region and potential connections. Together, these elements inspired the development of the vision, goals, strategies and actions within the Strategic Plan to assist in 'future proofing' the Islands in the most beneficial way.

For the Strategic Plan to be a plan for the community from the community a four-stage approach was adopted:

Figure 18: Stakeholder Engagement Process



The Plan was determined from a combination of statistical analysis, reviews of previous plans / reports and the outcomes of the comprehensive consultation program, which included:

- Consultations with representatives from over 15 groups on Home and West Islands. The consultations were a mixture of group and individual meetings as well as a community meeting on Home Island.
- Drawings and phrases from children at the CKI Schools showing what they loved about their home.
- Meetings in Christmas Island, Perth and Canberra with organisations that represented Cocos (Keeling) Islands and the Indian Ocean Territory generally.



- A community survey that was distributed to all post boxes in the Cocos (Keeling) Islands, published online through Survey Monkey, included in the Atoll and available at the IOTA office on West Island and the Shire on Home Island.
- An enquiry by design workshop organised by the Shire of Cocos (Keeling) Islands and facilitated by Mackay Design group, which focussed on master planning elements of the Plan.

In 2022, the Shire developed a new Strategic Community Plan. Consultation for that process involved occurred between April and June and included the below engagement methods.

*Figure 19: Summary of Stakeholder Engagement to Date*

<u>179</u>	Project launch letters to each household, with a copy of the project survey in both English and Cocos Malay attached	<u>6</u>	Meetings with community groups, including the Home Island Seniors Group
<u>1</u>	Shire website project news (Major Projects section)	<u>3</u>	Drop-In sessions at the Cocos Club
<u>5</u>	Social media announcements and updates	<u>2</u>	Workshops (one on Home Island, one on West Island)
<u>76</u>	Unique users visited the project website (where people could read about the project, watch the launch video, read the Frequently Asked Questions, take the survey and register their interest to be involved in the on-island engagement activities between 20 and 27 May 2022)	<u>14</u>	Informal catch ups
		<u>14</u>	Meetings (nine on-island, five on the mainland)
		<u>8</u>	Ideas with multiple votes for each at the Home Island ferry terminal display
		<u>+</u>	Posters displayed around both islands
<u>7</u>	Completed surveys		

In 2023 the further engagement was undertaken by the Australian Government's Department of Infrastructure, Transport, Regional Development and Communications and the Arts (DITRDCA) with the completion of the Indian Ocean Territories Waste Management Strategy.

Consultation with key stakeholders including SoCI and SoCKI and the WA Department of Water and Environmental Regulation (DWER).

## 6.6 Project Outcomes, Milestones and Timeline

An indicative delivery schedule for the preferred option has been developed along with core outcomes and milestones.

### 6.6.1 Project Outcomes

Table 11: Project Outcomes

Outcome	Measurement (KPI)	Actions / Tasks	Responsibility	Deadline
<b>Concept development</b>	Best practice waste management measures researched.	Community consultation and stakeholder engagement	CEO, Council, Stakeholders	Completed
<b>Project development</b>	Concept plan finalised, project management plan developed, risk management plan developed, quotes. Obtained.	Comprehensive research and documentation of project	CEO, Finance Manager, Infrastructure Manager, Council, Consultants (as appointed)	Completed
<b>Identify and source adequate funding</b>	Investigate funding sources and apply for funding.	Research opportunities and complete funding applications. Identify partner contributors and submit applications.	CEO, Council, Consultants (as appointed), Shire staff for stakeholder liaison	Completed
<b>Adequate confirmed funding</b>	Funding approved by identified funding partners.	Consider funding approved and ensure budget is adequate.	Funding partners, CEO, Finance Manager, Council	March 2024
<b>Project commencement</b>	Appointment of Designer.	Confirmation of plans, Shire approvals and other consents awarded.	CEO, Finance Manager, Infrastructure Manager, Project Manager, Council	May 2024
<b>Project implementation</b>	Project delivery commenced and progressed as specified.	As per project management plan and agreed tender.	Project Manager, Contractors, supporting Shire staff	October 2024
<b>Project completion</b>	Project completed on time, within scope and budget.	All work completed as proposed.	Project Manager, Council, CEO	October 2025
<b>Project acquittal</b>	Funding reports completed. Acquittals completed.	Reports to funding body together with acquittal documentation	Project Manager	December 2025

## 6.6.2 Project Milestones

The project team has developed the following broad project milestone, which are directly linked to timelines, outcomes, and Key Performance Indicators (KPIs).

*Table 12: Indicative delivery schedule*

Main Activities / Milestone	Milestone Date	Responsibility
Concept development (research, cost estimates, community consultation and stakeholder engagement)	2019 - 2023	Shire of Cocos (Keeling) Islands, Department of Infrastructure, Transport, Regional Development and Communications and the Arts – COMPLETED
Project development (Masterplan completed, funding opportunities investigated, project plan, benefit management plan and risk management plan completed)	December 2023	Shire of Cocos (Keeling) Islands, Department of Infrastructure, Transport, Regional Development and Communications and the Arts – COMPLETED
Funding secured; Funding Agreement signed	March 2024	Shire of Cocos (Keeling) Islands, Department of Infrastructure, Transport, Regional Development and Communications and the Arts
Tender Process (documentation, advertising, review)	April 2024	Shire of Cocos (Keeling) Islands
Commencement of Project (Project Manager appointed, contractors appointed, design confirmation, scheduling of works)	May 2024 (before the 15 <sup>th</sup> of May in line with grant guidelines)	Shire of Cocos (Keeling) Islands
Project implementation – mobilisation and construction - commences	October 2024	Shire of Cocos (Keeling) Islands, Project Manager, Contractors as appointed
Project completion	October 2025	Shire of Cocos (Keeling) Islands, Project Manager, Contractors as appointed
Final reporting and acquittals	December 2025	Shire of Cocos (Keeling) Islands

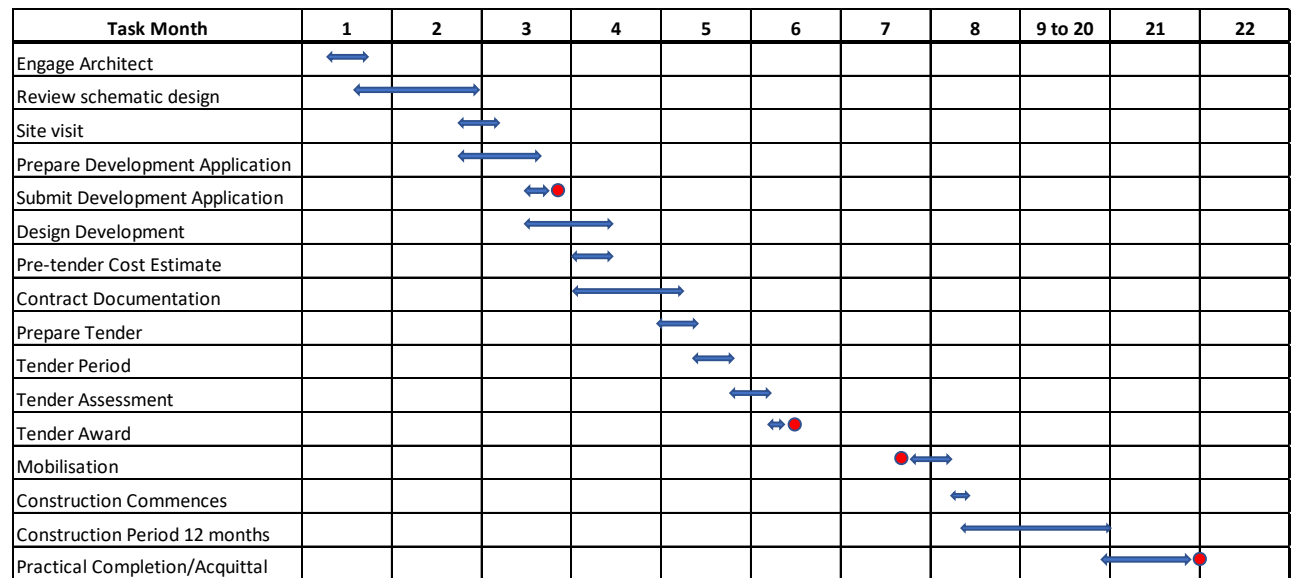
### 6.6.3 Project Timeline

Timing commences once funding is secured.

This has been estimated to be achieved by December 2025.

A Gantt chart indicating the estimated project timeline for the delivery of the project is illustrated in Figure 20.

Figure 20: Project Gantt Chart



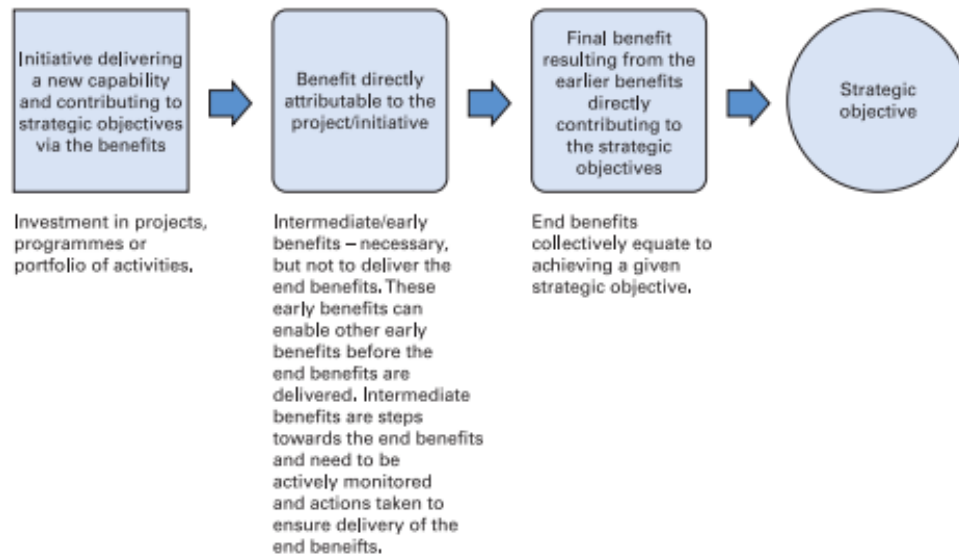
## 6.7 Benefits Management

Post implementation performance monitoring is a key element in ensuring the delivery of fit for purpose infrastructure.

As part of the Project Management process for the Waste and Resource Recovery Facilities project, the Shire of Cocos (Keeling) Islands will identify the benefits associated with the project, which will be realised once the project becomes operational.

Benefit realisation is the principal outcome of the project and should be measured to evaluate the success of the project throughout its useful life. This requires assessing if the Waste and Resource Recovery Facilities meet or exceed expectations over the short, medium, and longer term. Using the framework as identified in Figure 21 will achieve this.

Figure 21: Benefits Mapping Process



The Shire of Cocos (Keeling) Islands and key stakeholders are tasked with the ongoing review and assessment of the performance of the Waste and Resource Recovery Facilities.

To assist with this process, the Shire will outline the key expected benefits of the project, the benefit owner, the methodology for ongoing measurement of these benefits, and the proposed benefit targets that will provide a benchmark for assessment of actual realised benefits. Example benefits that will be measured are shown in the Table below.

Figure 22: Benefit Register – Direct Benefits, Metrics and Targets

Benefit	Benefit	Measure	Baseline	Target
1	Increased Employment	Persons employed in CKI waste management services		6
2	Eliminate environmental impact of waste disposed on island	Volume of waste buried on Cocos Keeling Islands	150T ash buried on CKI	0
3	Increased reuse of materials on island	Volume of waste reused on Cocos Keeling Island	0	50T
4	Recycling of materials	Volume of materials removed from the waste stream for recycling on mainland	30T	150T
6	Improved environment waste management practices	Stakeholder feedback during annual survey	Negative	Positive average
7	Volunteering Benefits	Hours of volunteering at the facility	0	15 total volunteer hours per week by 2025
8	Skills and knowledge development	Training delivered at the facility to increase community awareness of waste management.	0	Two open days per year plus school initiatives

## 7 CONCLUSION

In conclusion, the Shire of Cocos (Keeling) Islands proposed Waste and Resource Recovery Facilities is expected to provide significant and tangible benefits to the Shire and broader community both during and post construction. These benefits include but are not limited to:

- Increased employment
- Best practice waste management infrastructure and processes
- Improved environmental outcomes
- Community use of the facility
- Opportunities for volunteering
- Increased skills development for local population

The project delivers on key priorities identified by the Department of Infrastructure, Transport, Regional Development and Communications and the Arts in the Indian Ocean Territories Waste Management Strategy.

# APPENDICES



# Appendix 1

## Options Multi-Criteria Analysis Assessment

Colour code	Description
	Option warrants further investigation or exploration. Lower risk option.
	Potentially viable option. Moderate risk option.
	Unsuitable for the IOT.

## RRF Options Assessment

Assessment criteria	Options considered	
	1. IOT RRF hub on CI	2. Upgrade existing / build resource recovery transfer station/s on CKI
Technical maturity and practicality	<p>CKI would be required to continually ship material to CI. This would require continual handling and administration by CKI. It is noted that shipping materials between islands (for offloading at either island) does not often occur although the regular shipping service from CKI to CI (and then Singapore and Perth) would enable shipping from CKI to CI (or beyond).<sup>13</sup></p> <p>A facility hub increases the feedstock of different waste streams which can make processing facilities more economically viable long term.</p> <p>The waste transfer stations on CKI would likely be required to be upgraded to facilitate appropriate storage and streamline the handling and removal of the various waste streams from CKI to CI.</p> <p>Extreme weather events disrupting shipping services would make this option difficult to facilitate and impractical.</p>	<p>CKI already has transfer stations that could be used or enhanced as integrated RRF's. These would require upgrading (additional undercover storage of recovered recyclables) to meet AQIS requirements, and to facilitate a higher resource recovery rate and to support processing options that may be implemented within CKI (refer Section 3.8).</p> <p>As there are existing waste transfer stations on CKI this is a more practical option, particularly as they already process some recyclable waste i.e., bale aluminium and crush glass.</p> <p>An EPS melt machine is installed at CKI however appears to be operating outside design parameters (too hot) and may require servicing, adjustment, repair or replacement.</p>
Operational requirements	<p>Administration.</p> <p>Extra staff.</p> <p>Upgrade existing utilities.</p> <p>Ongoing discussion with shipping / flight companies.</p> <p>Increased rate of shipping / flight services.</p> <p>Increased handling and logistics considerations and dependencies – loading, and unloading, inland transport and container handling at port - for exportation off island from CKI and on-island at CI. Maximum shipping container size is 20' ft due to handling constraints.</p>	<p>Extra staff.</p> <p>Upgrade existing facilities on CI and CKI.</p>
Environmental and strategic drivers	<p>Through the increased transportation of waste greenhouse gas emissions heighten.</p> <p>A MRF generally supports a circular economy, where waste is circulated in the economy as long as possible before final disposal. However, logistics constraints in the IOT, including quarantine restrictions, present significant cost and commodity management challenges (for conventional approaches to recycling) and environmental implications must be carefully assessed.</p>	<p>A MRF generally supports a circular economy, where waste is circulated in the economy as long as possible before final disposal.</p>
Risk, Health and safety	<p>Additional handling and significantly more steps in the supply chain increase the likelihood of adverse health and safety outcomes.</p>	<p>Minimal additional health and safety risks.</p>
Social-economic considerations	<p>Job opportunities for CI.</p> <p>Potential additional job opportunities for CKI.</p> <p>Well trained staff required.</p>	<p>Job opportunities.</p>
Financial feasibility - Capital cost	<p>Upgrade waste transfer station on CKI to facilitate storage and handling considerations</p>	<p>Lower capital cost to upgrade facility (relative to shared RRF hub on CI).</p>

Assessment criteria	Options considered	
	1. IOT RRF hub on CI	2. Upgrade existing / build resource recovery transfer station/s on CKI
Financial feasibility – Operational cost	<p>Cost prohibitive. The ongoing cost of processing off-island for CKI's waste would be additional to current practices, as well as transportation of waste to CI. CI is effectively no closer to Perth than CKI for sale of recyclable materials to downstream processing, unless markets in Singapore can be accessed.</p> <p>There would likely be a higher financial burden for SoCKI to sustain in the long term. The fee to process and/or dispose of waste is at the discretion of SoCI.</p> <p>Rates to transport to CI are \$12,500 per 18 ft container (not including documentation and BAF fees). If 100 containers per year were shipped this would cost around \$1,250,000 per annum, or \$1,786/tonne. As such, its likely more financially feasible for SoCKI to continue to incinerate residual waste and sort, aggregate and stockpile recyclable materials until sufficient quantities realise transport efficiency to send commodities to off-takers, and as such, the central CI MRF concept may not be effective.</p>	<p>Risk that there is not enough commodity volume produced by CKI for a MRF to be financially feasible, given shipping costs back to Perth (or Singapore if accessible and permitted).</p> <p>Lower cost option compared to IOT RRF hub on CI, however cost and practical constraints around maintaining additional infrastructure need to be carefully considered.</p> <p>No alternative scenarios have been identified that are practicable and readily available due to isolation, limited disposal options and limited available resources.</p>
Overall screening assessment rating	Unlikely to be viable for the IOT	Possibly suitable for the IOT

## Residual Waste Options Assessment

	Options considered	
	1. Two small scale incinerators for each of the main Islands	2. Transportation off island for consolidation to CI
Type of feedstock	Technology can apply to various types of waste inputs. Feedstocks include municipal solid waste (MSW), plastics, tyres, mixed commercial wastes, waste oil and biomass. Inert waste is considered unsuitable.	All waste. Noting that the freight and airline companies only allow some hazardous waste types to be transported. The Commonwealth has a contract with CKI Coop for inter-island freight within CKI, however, it is noted that shipping between CKI and CI does not occur often. <sup>63</sup> These logistical challenges would have to be resolved for this option to be feasible.
Outputs	Residual ash must be disposed to landfill or removed from island. WTE technology can use own energy produce to power the system as well as produce heat, though likely impractical at less than 1,000 tpa waste input per system.	Total annual tonnage from CKI of ~1,200 tonnes to be shipped to CI. If assume average 12 tonnes per container, this would amount to 100 containers per year (averaging around 8 x 20 ft containers per month).

	Options considered	
	1. Two small scale incinerators for each of the main Islands	2. Transportation off island for consolidation to CI
Operational requirements	<p>Waste streams must be sorted appropriately and efficiently. The drier the waste stream the less heat (and supplementary fuel) required for complete combustion and emissions management.</p> <p>This technology requires a relatively skilled and reliable operator to ensure that the technology is being used correctly.</p> <p>Ongoing maintenance is required for the continual reliability and economic operation of the system.</p>	<p>CKI would be required to continually ship material to CI. This will require continual handling and administration by CKI.</p> <p>A facility hub increases the feedstock of different waste streams which can make processing facilities more economically viable long term.</p> <p>The waste transfer stations on CKI would likely be required to be upgraded to facilitate appropriate storage and streamline the handling and removal of the various waste streams from CKI to CI. Compaction equipment and dedicated containers (packer bodies) would likely be required.</p>
Technical maturity and practicality	<p>Incineration of MSW is considered a proven technology used at a commercial scale for many years.</p> <p>Incinerators are relatively simple to establish due to modular units being available to purchase.</p> <p>Incineration is a more practical option for CKI than exportation of material as waste can continue to be disposed of when shipping is restricted (e.g. by swell, storms, cyclones).</p>	<p>Administration.</p> <p>Extra staff.</p> <p>Upgrade existing utilities.</p> <p>Ongoing discussion with shipping / flight companies.</p> <p>Increased rate of shipping / flight services.</p> <p>Increased handling considerations to prepare for exportation off island.</p> <p>Odour and corrosion potential (containers) would need to be managed in storage and shipment.</p> <p>In extreme weather events this option will be difficult to facilitate continuity. A missed shipping cycle could cause significant complications.</p>
Environmental and strategic drivers	<p>There are advanced systems that claim to eliminate nearly all emissions and produce heat and hot water, reducing reliance on expensive fuel imports.</p> <p>Enable waste to be safely and immediately treated. Consequently, reducing the environmental health risks caused by accumulation of waste and open burning.</p>	<p>A MRF generally supports a circular economy, where waste is circulated in the economy as long as possible before final disposal.</p> <p>Through the increased transportation of waste greenhouse gas emissions heighten.</p>
Risk, Health and safety	<p>Safety considerations are incorporated within incinerator units. Health and safety risks can be greatly reduced and even mitigated if operated correctly and with caution.</p> <p>Potential of negatively affecting the operator's health if there were an accident / explosion.</p> <p>If the wrong feedstock (i.e. metals) is fed into the machine the fumes that the incinerator emits might have a negative effect on operators.</p>	<p>Additional waste handling at CKI and CI increases potential for adverse health and safety events and outcomes.</p>
Social economic considerations	<p>Employment opportunities. However, will require reliable staff that can ensure that the incinerator is adequately supervised and maintained.</p>	<p>Job opportunities for CI.</p> <p>Potential additional job opportunities for CKI.</p>

	Options considered	
	1. Two small scale incinerators for each of the main Islands	2. Transportation off island for consolidation to CI
	<p>Incinerators should only be operated by trained operators.</p> <p>There is a perception of human health risks associated with air pollution from incinerators in Australia.</p>	
Financial feasibility - Capital costs	<p>High cost –</p> <p>200 – 400 tpa = approximately \$200,000 - \$350,000 excluding delivery and installation (Inciner8) – excluding approvals, commissioning and procurement management.</p> <p>Additional energy recovery system \$35,000 - \$70,000.</p> <p>SoCKI are understood to have been quoted \$800,000 for a replacement incinerator for Home Island (installed and commissioned).</p>	<p>Upgrade waste transfer station on CKI to facilitate storage and handling considerations</p> <p>Likely &gt;\$1 million</p>
Financial feasibility – Operational costs	<p>The operational cost of these incinerators is largely related to the supplementary fuel (e.g. diesel) and maintenance and servicing of the machine. For example, the cost of operation over a 20-year period was deduced from the Addfield G500 Automatic which has a processing capacity of 9.6 t/per day (24 hr operation) is approximated to be and is approximated to have an operating cost of \$1,990,000 for 20 years total (not including diesel costs).</p> <p>A second disposal system would be required to dispose of the ash generated by the incinerator, as well as the non-combustible portion of residual waste (e.g., glass, metals, ceramics), and to facilitate disposal of inert waste.</p> <p>Although cost estimates have been provided for this option, operational costs are largely dictated by what is being incinerated. It is important to also examine the actual operational costs and the cost of fuel and electricity consumed. If energy recovery technology is included, it can potentially partially offset utility costs.</p> <p>It is noted that if organic waste was diverted to recycling, the cost burden for operating the incinerator/s would be lower, due largely to the smaller tonnage, and lower moisture content of the residual waste being combusted.</p>	<p>The SoCKI will have to continue to pay SoCI to recover waste. As well as to transport waste to SoCI. This would be a high financial burden for SoCKI to facilitate long term.</p> <p>The fee to dispose of waste is at the discretion of SoCI.</p> <p>Rates to transport to CI are \$12,500 per 18 ft container (not including documentation and BAF fees). If 100 containers per year were shipped this would cost \$1,250,000 per annum. This would equate to \$1,786/tonne plus disposal or recycling gate fees. As such, its more financially feasible for SoCKI to continue to incinerate/stockpile waste and as such the central MRF may not be cost effective.</p>
Overall screening assessment rating	Possibly suitable for CI.	Unlikely suitable for CI.

# Appendix 2

## Risk Register

Risk – summarised title	Consequence	Likelihood	Risk Rating (without controls in place)	Causes	Consequences/impacts	Description of treatments – measures to be implemented to mitigate/prevent the risk	Risk Owner	Consequence after controls	Likelihood with controls	Residual Risk Rating (with controls in place)
<b>PROJECT MANAGEMENT</b>										
<b>Securing construction contractor for project</b>	Moderate	Unlikely	Medium	Availability of construction contractors and accommodation on Island	Project delays; Increased cost due to competition	Wide advertising of tender. Briefings to local builders to encourage local tenders.	CEO	Moderate	Unlikely	Medium
<b>Job approval process delays project progression</b>	Moderate	Unlikely	Medium	Inadequate project governance	Project delays	Robust contract based on WALGA model. Delegations in place.  Prioritised work with planners and Council	CEO	Moderate	Rare	Medium
<b>Project changes are made outside scope of original project design</b>	Minor	Unlikely	Low	Inadequate project governance and reporting	Funding jeopardised; Increased costs	Contract establishes project governance. Project Management from experienced Management staff and contractors	Low Risk managed as part of normal processes	Minor	Unlikely	Low
<b>Poorly defined project scope leading to insufficient funding and inability to access project resources</b>	Moderate	Unlikely	Medium	Inadequate planning and understanding of project requirements and unique geographic location	Project unable to be completed: Funding jeopardised	Design process to include QS pricing checks relevant to Cocos Keeling Islands with brief to ensure can be completed within budget. Support from qualified and experienced staff	Low Risk managed as part of normal processes	Minor	Unlikely	Low
<b>Site conditions do not meet expectations accounted for in project planning</b>	Moderate	Unlikely	Medium	Contractor does not understand location	Project delays; Shortfall in project funding	Experience in construction in Cocos Keeling Island environment a factor in tender selection.  Reference checks of tenderers. Support from local Manager of Works and Services. Support and advice from Architect who has worked on CKI previously.	Project Manager	Moderate	Rare	Medium
<b>Design error or planning fails to adequately address requirements,</b>	Moderate	Unlikely	Medium	Shire of CKI approves design that does not meet planning requirements	Project delays; Increased costs; Funding jeopardised; Non-compliance with WALG requirements; Quality;	Shire of Dandaragan qualified planners and Building Surveyor engaged in planning process. Design and oversight support from experienced Architect.  Design approved as per <a href="#">planning approval</a> and	CEO	Moderate	Rare	Medium



Risk – summarised title	Consequence	Likelihood	Risk Rating (without controls in place)	Causes	Consequences/impacts	Description of treatments – measures to be implemented to mitigate/prevent the risk	Risk Owner	Consequence after controls	Likelihood with controls	Residual Risk Rating (with controls in place)
Shire of Cocos (Keeling) Islands										
					Reputational damage	<a href="#">building approval processes.</a>				
<b>Breakdown in client – contractor relationship</b>	Moderate	Unlikely	Medium	Serious dispute or major variation to project	Project delays; Increased costs; Reputational damage	Tender evaluation to include reference checks. Regular meetings between contractor Shire Staff and Management.	Project Manager/CEO	Moderate	Rare	Medium
<b>Damage or theft to site, equipment and tools</b>	Minor	Unlikely	Low	Inadequate site security. Actual events of crime or inappropriate behaviour.	Significant value of materials lost; Project delays; Increased costs; Reputational damage	Site Management Plan to ensure responsibility remains with contractor/management staff for site and material security. Contractor/ Shire management staff responsible for site and material security and general site presentation and insurance.	Risk managed internally by Shire Management staff and Contractor.	Moderate	Rare	Medium
<b>Performance of construction contractors</b>	Moderate	Possible	High	Contractors performance does not meet expectations due to poor communication channels and misunderstanding of expectations	Project delays; Increased costs; Reputational damage	Robust Contract and project plan. Contractors to provide regular reporting on project progress against plan.	Project Manager/CEO	Moderate	Unlikely	Medium
<b>RESOURCE AVAILABILITY</b>										
<b>Availability of construction materials</b>	Moderate	Possible	High	Air or sea freight availability does not meet requirements <sup>1</sup>	Project delays; Increased costs;	Contractor/project manager and procurement staff responsible for delivery of construction materials to site. Appropriate planning and timelines.	Contractor/Project manager, Management Staff	Moderate	Unlikely	Medium
<b>Unexpected increase in the cost of construction material</b>	Moderate	Possible	High	Logistics of getting material to the island, and then storing the material once it arrives may impact how much can be delivered at any one time and therefore expose materials to price fluctuations.	Increased costs	Management staff, procurement officer, Shire senior builder to co-ordinate material purchasing and storage once on island.	Management staff, procurement officer, Shire senior builder	Moderate	Unlikely	Medium
<b>Quality of material impacted by high humidity</b>	Moderate	Unlikely	Medium	Materials selected for construction not appropriate for ocean water or high humidity	Quality	Management staff, senior builder and procurement officer are responsible for material selection Defect liability period in contract.	Management staff, procurement officer, Shire senior builder	Moderate	Rare	Medium

## Shire of Cocos (Keeling) Islands

[illegible]

Shire of Cocos (Keeling) Islands

Community resistance to project	Minor	Rare	Low	Site conditions, dust, noise, , tidiness and hygiene poorly managed	Project delays due to complaints	Site is well away from residential area. Site Management Plan Dust Management Plan	Low Risk managed as part of normal processes	Minor	Rare	low
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