



**MOUNT LOFTY GOLF ESTATE
GOLFLINKS ROAD, STIRLING**

WASTE MANAGEMENT AND MINIMISATION PLAN



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1. EXECUTIVE SUMMARY

CIRQA has been engaged to prepare a Waste Management and Minimisation Plan (WMMP) for the Mount Lofty Golf Estate development at 35 Golflinks Road, Stirling. The project forms the redevelopment of the existing Stirling Golf Club to provide tourist accommodation and associated hospitality facilities along with the existing golfing facilities.

This WMMP applies to waste generated from the site preparation and construction phase and the operational phases of the development. The WMMP has been prepared on the basis of plans prepared by R Architecture (Drawings TP01 to TP17 dated 29 November 2022).

The objective of the WMMP is to identify the guiding principles and procedures for the development during construction and operation. The WMMP has been prepared to reflect to requirements of the “*Environment Protection Act 1993*” and “*South Australia's Waste Strategy 2020-2025*”. Specifically, the WMMP aligns with the waste management hierarchy identified in these documents prioritising the avoidance, minimisation, reuse and recycling of waste (in that order) over disposal to land fill.

The WMMP identifies potential sources of waste during the construction and operation phases and the principles, procedures and responsibilities for the management and minimisation of waste materials associated with the development.

The provisions contained within the WMMP should be subject to further review as the construction methodology is refined and periodically during the operation of the site (in particular, once the tourism operator has been confirmed).

2. BACKGROUND

2.1 OBJECTIVES

The purpose of this WMMP is to outline the management and minimisation of waste generated during both the construction and operational phases of the proposed development. The WMMP includes review of potential waste sources during construction and operation and details measures for the management, reuse, recycling and disposal of the various waste materials.

2.2 LEGISLATIVE REQUIREMENTS AND RELATED DOCUMENTATION

Within South Australia, the “*Environment Protection Act 1993*” (The Act) provides the legislative requirements in respect to the protection of the environment with the State. The Act includes consideration of the management and minimisation of waste. All waste management activities undertaken within and for the development (during both construction and operation) shall be undertaken in accordance with the requirement of The Act.

In addition to The Act, Green Industries SA has published “*South Australia’s Waste Strategy 2020-2025*” which sets out a framework of policies, strategies and plans for the management of waste within South Australia whilst meeting the State Government’s priority for economic growth. A key priority of SA’s Waste Strategy is a transition to a ‘circular economy’ which it defines as:

“...an economic model that contemplates the production and goods and services:

- by reducing reliance on virgin materials*
- on the basis of continuously functioning utility and an extended lifecycle*
- in a manner that eliminates, as far as is reasonably practicable, waste or pollution, or harm to the environment.”*

To support the transition to a ‘circular economy’, the Waste Strategy identifies the follows priority actions (which can be incorporated into the management of waste materials for the subject development during construction and operation):

- avoid waste;
- improve resource recovery;
- increase use of recycled material and build demand and markets for recycled products;
- better manage material flows to benefit human health and wellbeing, the environment, and the economy; and
- improve information to support innovation, guide investment and enable informed consumer decisions.

Such priorities are reflected in the 'Waste Management Hierarchy' (which is also identified in The Act) as illustrated in Figure 1. The management of waste associated with the construction and operation of the proposed development will be undertaken in line with the hierarchy.

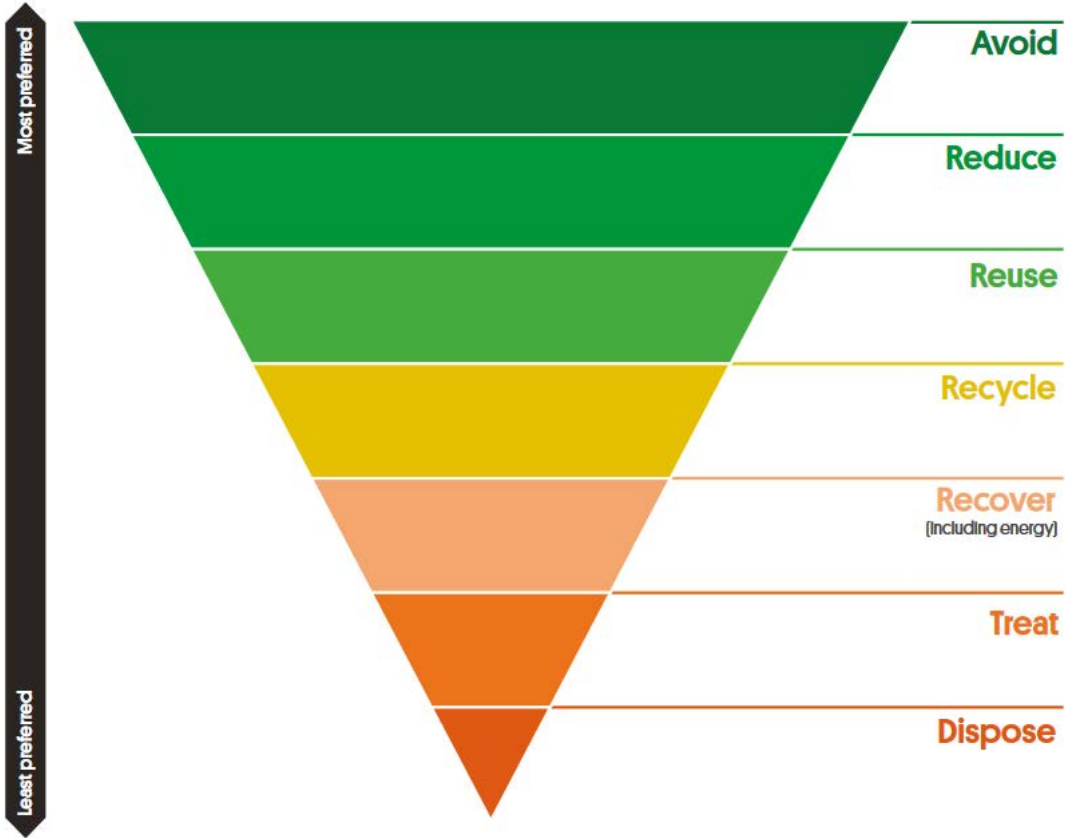


Figure 1 - Waste management hierarchy

(Source: after "South Australia's Waste Strategy 2020-2025", 2020)

3. PROJECT DESCRIPTION

3.1 SUBJECT SITE

The subject site is located on the corner of Old Carey Gully Road and Golflinks Road, Stirling. The site is bound by residential properties to the north, Mount George Conservation Park to the east, Golflinks Road to the south and Old Carey Gully Road to the west. Figure 1 illustrates the location of the subject site.

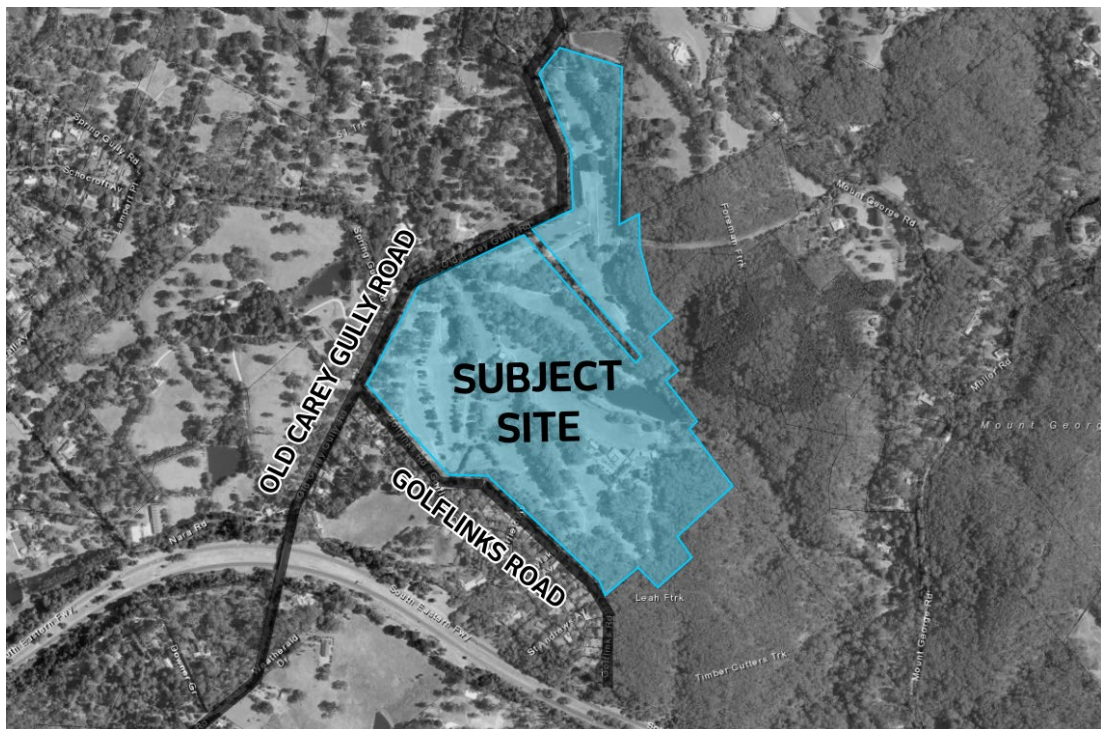


Figure 2 – Location of the subject site with respect to the adjacent road network

The subject site is currently occupied by the existing Stirling Golf Club including the 18-hole golf course and its associated clubroom, pro-shop, five motel rooms, offices, maintenance buildings and the 'Perfumery' building. The Club hosts functions and weddings (for up to 300 guests) as well as regular events. Waste generated by the existing facilities are generally separated and stored on-site (generally adjacent the clubroom building) and collected by private refuse collection contractors.

3.2 PROPOSED DEVELOPMENT

The proposed development comprises the demolition of the existing golf club buildings within the site and the construction of a new tourist accommodation facility. Specifically, the proposed development comprises:

- Hotel - 3-5 level hotel building comprising:
 - 56 hotel suites;

- 15 x two bedroom serviced apartments;
- 15 x three bedroom serviced apartments;
- 2 penthouse serviced apartments;
- back of house, plant storage and maintenance areas;
- a 537 m² function room;
- a 212 m² restaurant with 89 m² external terrace;
- a 186 m² sports bar.
- a 189 m² gallery and café; and
- a 94 m² wellness centre with 125m² gym and spa/massage treatment rooms.
- Private retreats – ‘Pods’
 - 17 x one bedroom units; and
 - 1 x back of house Service Pod.
- Adaptive reuse of the existing perfumery:
 - refurbishment of the existing local heritage place to accommodate a multipurpose space for use as café, retail or functions;
 - extension to the Perfumery to include a covered outdoor dining area; and
 - orchard and perfumery garden plantings to reimagine the former use of the building as a “Scent Factory”.
- Golf Course Facilities
 - retention of 18-hole golf course with improvements;
 - refurbished function facilities, cart storage and 138 m² clubhouse in new building; and
 - new 97 m² pro-shop, administration areas, gym and change rooms.

3.3 DEMOLITION AND CONSTRUCTION PHASE

The key construction activities to develop the new tourist accommodation facilities are anticipated to consist of the following:

- establishment of temporary construction site (offices, ablutions etc.) albeit during some stages of construction existing buildings may be utilised;
- demolition of a number of existing buildings, structures, paths and internal road/car park areas;
- clearance of vegetation where new works are proposed;
- earthworks/excavation where new works are proposed and (temporary) stockpiling of soils and fill;
- transport of construction equipment and materials to the site;

- construction of footings/foundations (concrete pouring);
- construction of new buildings and hard and soft landscaping;
- removal of construction waste materials (or reuse on-site where possible);
- rehabilitation of areas disturbed during the construction processes; and
- commissioning of the new facilities.

3.4 OPERATIONAL PHASE

The key activities associated with the development (once completed and occupied) will relate to the continued use of the golfing facilities, accommodation of tourists, operation of the food, beverage and hospitality uses and various servicing and maintenance activities associated with the various facilities within the site. This will include the collection, segregation, reuse, recycling and removal of waste materials generated by the site's uses in line with this WMMP.

4. WASTE MANAGEMENT

The Waste Management Hierarchy identified in Section 2 forms the basis of the approach to waste management (and minimisation) for the proposed development. Such an approach aligns with the requirements of the “*Environment Protection Act 1993*” as well as the “*South Australia's Waste Strategy 2020-2025*”.

The management approach outlined in this WMMP will provide benefit to the owners and operators of the development as well as the broader community through reduced disposal costs, reduced liabilities and ethical/moral outcomes. The minimisation of waste materials will be particularly important for the tourist accommodation and hospitality uses given such uses traditionally generate relatively high levels of ‘waste to landfill’ (a reasonable proportion of which is avoidable).

4.1 DEMOLITION AND CONSTRUCTION PHASE

The demolition of existing buildings and infrastructure within the site and construction of the proposed development will result in the generation of a variety of waste materials. Table 1 identifies the primary potential sources of waste during these stages of the development.

Table 1 – Potential Sources of Waste during the Construction Phase

Waste Type	Activity
Spoil	Excavation and Site Preparation
Potentially Contaminated Soil	Excavation and Site Preparation
Clean Fill	Excavation and Site Preparation
Organic Waste/Vegetative Matter	Land and Vegetation Clearance
Waste Water	Demolition and Construction Processes
Waste Concrete	Demolition and Construction Processes
Scrap Metal	Demolition and Construction Processes
Timber Waste	Demolition and Construction Processes
Other Waste (Bricks, Plasterboard, Glass etc.)	Demolition and Construction Processes
Hazardous Materials/Chemicals	Demolition and Construction Processes

The various waste materials generated during the construction phases (including demolition) will be stored within the site and clearly separated for reuse, recycling or disposal. The ultimate locations and extent of area retained for separated waste storage will be identified once the construction contractor has been selected and its construction methodology identified. The WMMP can be updated once this has occurred (or, alternatively, this could form part of a Construction Environment Management Plan (CEMP). Given the size of the subject site, it is

anticipated that there will be ample area for the appropriate storage and segregation of waste materials during the construction phases.

During the construction phase, contractors and subcontractors will be required to adhere to the WMMP (and CEMP). The head contractor shall ensure that all workers/trades:

- take reasonable measures to avoid and minimise waste generation from their work;
- take reasonable measures to reuse and recycle waste materials from their work;
- minimise oversupply of materials and any oversupplied materials are returned to the supplier or reused/recycled; and
- appropriately separate waste streams and transfer to on-site collection and storage areas.

In addition, the head contractor/site manager will be responsible for:

- ensuring that adequate areas for the on-site storage of waste materials are set aside with clearly defined separation between waste types (including clear separation of materials for reuse and recycling);
- ensuring that there is coordination between subcontractors to minimise waste generation and maximisation of on-site reuse of waste materials;
- regularly monitor waste storage areas and containers to ensure appropriate waste separation is occurring and to minimise contamination or leakage;
- ensuring that works are inducted and trained in respect to the principles and requirements of the WMMP;
- ensuring contractors engaged to transport waste to recycling, reuse/recovery or disposal facilities are appropriately licenced; and
- ensuring that non-conformances are identified and corrective action is taken where required to ameliorate issues and/or hazards.

In respect to the management of hazardous waste during the construction phase, the following procedures shall be followed:

- all hazardous wastes are to be correctly identified and separated into individual categories;
- suspected hazardous waste will be treated as hazardous until confirmed otherwise; and

- all hazardous wastes are to be handled, stored (including clear signage identifying the waste and any associated risks) and disposed of in accordance with relevant legislation and policies.

Contractors transporting waste materials from the site to reuse/recovery, recycling or disposal facilities will be required to identify the intended facilities to ensure that they are appropriately licenced and relevant legislative requirements are met, that the principles of the WMMP are met and the maximum diversion from landfill is achieved.

4.2 OPERATIONAL PHASE

An assessment of the waste management considerations has been prepared based on typical generation rates adopted within SA (for instance, from Zero Waste's "South Australian Better Practice Guide", 2014). Specifically, the following rates have been adopted for the assessment of the proposal:

- **tourist accommodation** (applied to the hotel rooms and pods)
 - general waste – 5 L per bedroom per week;
 - recycling – 3 L per bedroom per week; and
 - green organics (including food waste) – 1.5 L per bedroom per week.
- **high density apartment dwellings** (applied to the apartments)
 - general waste – 30 L per bedroom per week;
 - recycling – 25 L per bedroom per week; and
 - green organics (including food waste) – 10 L per bedroom per week.
- **bar** (applied to the bar and clubhouse)
 - general waste – 5 L per 10 m² floor area per day;
 - recycling – 5 L per 10 m² floor area per day; and
 - green organics (including food waste) – 0.25 L per 10 m² floor area per day.
- **restaurant** (applied to restaurant, café, function area and perfumery building)
 - general waste – 30 L per 10 m² floor area per day;
 - recycling – 5 L per 10 m² floor area per day; and
 - green organics (including food waste) – 40 L per 10 m² floor area per day;
- **retail** (applied to pro-shop)
 - general waste – 5 L per 10 m² floor area per day;
 - recycling – 2.5 L per 10 m² floor area per day; and

- green organics (including food waste) – 0.25 L per 10 m² floor area per day.
- **office** (applied to golf administration area – noting that offices associated with the other uses are accounted for in the above rates)
 - general waste – 15 L per 10 m² floor area per week;
 - recycling – 15 L per 10 m² floor area per week; and
 - green organics (including food waste) – 2.5 L per 10 m² floor area per week.

For the gym and wellness centre, it is assumed that these are wholly ancillary to the tourist accommodation and waste associated with these uses is already accounted for in the 'per room' rates. In addition, a 30% discount has been applied to the café and perfumery areas (as café style dining typically generates lower rates than full service restaurants) and a 50% discount has been applied to the function room (as it would be unlikely that the function areas would be utilised at full occupancy every day of the week).

On the basis of the above rates, the new uses (excluding the golf facilities) are forecast to generate:

- **general waste** – 18,341 L per week;
- **recycling** – 4,612 L per week; and
- **green organics (including food waste)** – 21,776 L per week.

Based on the above, the following number of bins and servicing frequencies have been identified:

- **general waste** – ten (10x) 660 L bins serviced three times a week;
- **recycling** – four (4x) 660 L bins serviced twice a week (to maximise reuse and recycling, these will be further segregated to cardboard, plastics, glass and cans (one bin each); and
- **green organics (including food waste)** – eleven (12x) 660 L bins serviced three times per week.

In reality, lower levels of green organics waste will need to be collected from the site as the golf course will utilise a proportion for composting. Management and staff of the tourist accommodation and hospitality uses should maximise separation of green organic waste for composting (where safe and appropriate). Similarly, green waste (such as grass clippings, vegetation trimmings etc.) from the golf course maintenance will also be retained on-site for composting. External

areas (adjacent maintenance facilities) will be set aside for composting of organic materials and reuse within the golf course and landscaped areas within the site.

It is also likely that there will be additional efficiencies achieved in waste management than suggested by direct application of the above 'stand-alone' rates.

Nevertheless, as a worst case, the bin store areas have been designed to accommodate 28x 660L bins as illustrated on the R Architecture plans. The above assessment indicates that there will be a need for approximately 25 bins (660 L) and that sufficient room has therefore been provided to accommodate likely waste generation levels. Specifically, there will be a bin room on the lower ground floor (with room for 14 bins) and a bin room adjacent the service bay on Level 1 (with room for 14 bins). Staff will rotate bins between the two areas as required when they become full and for collection.

In addition to the above primary waste streams, it is anticipated that there would also be a range of secondary waste materials generated by the operation of the site. These include used batteries, used ink/toner cartridges, disused and electronics/IT equipment.

Waste materials not able to be reused within the site will be collected by waste contractors from the service bay on Level 1 for transport to recycling, recovery or waste disposal facilities. As detailed in the traffic impact report for the development, the service area has been designed to adequately and safely accommodate refuse collection vehicle movements.

The following specific responsibilities and tasks should be undertaken by building management/maintenance staff during the operation of the site:

- ensure that the waste area is secured to avoid theft and/or inappropriate use of the waste provisions;
- ensure that the waste area and transfer pathways are inspected and cleaned routinely to ensure these areas are kept hygienic and clear of loose waste;
- ensure that bins are labelled/signed appropriately to identify the relevant waste type;
- ensure that staff (including cleaning and maintenance contractors) are inducted and educated in respect to the appropriate management and disposal of waste within the site; and
- ensure that staff (including cleaning and maintenance contractors) adhere to the waste management arrangements and manage undesirable behaviour as and if required.

4.3 TRAINING AND EDUCATION

During both the construction and operational phases, site employees and contractors shall be inducted in respect to principles and procedures outlined in this WMMP. In particular, all employees and contractors are to have a clear understanding of the prioritisation of waste avoidance, reuse and recycling, the segregation of waste types and where they are stored.

5. WASTE MINIMISATION

5.1 WASTE AVOIDANCE AND MINIMISATION

The generation of waste will be avoided where possible during the construction phase by the strategic selection of materials during the detailed design and documentation of the project. In particular, the following outcomes shall be sought through the documentation, tendering and procurement stages of the development:

- the selection of materials for the proposal should include consideration of and, where possible/feasible, adopt options which reduce waste generation for the development;
- the specification and procurement of materials should be carefully planned to ensure that materials are not unnecessarily over-supplied;
- opportunities for prefabrication of items should also be explored during detailed design and procurement and adopted where practical to minimise surplus material;
- specification of recyclable materials and items where possible to minimise waste to landfill during construction;
- request that packaging materials utilised by suppliers are recyclable or returnable for reuse; and
- identify construction methodologies to minimise vegetation clearance and excavation where possible.

During the operation of the development, there will be a number of opportunities to avoid and minimise the generation of waste. Notably, significant proportions of waste generation at tourist facilities typically relate to packaging waste which can relatively easily be avoided or minimised. Best practice measures to avoid and minimise waste include:

- selection of goods and products with less packaging and returnable packaging;
- sourcing of goods and products locally, where possible (this could include on-site growing of herbs, fruits and/or vegetables);
- storage of perishable goods in appropriate conditions to avoid spoil;
- minimising the number of individually packaged toiletries within accommodation rooms (e.g. use refillable soap and shampoo dispensers instead of small individual products, non-essential toiletries provided on request only);

- requiring that single use plastic straws, cutlery and stirrers, polystyrene cups, bowls, plates and containers, and oxo-degradable plastic products not be supplied or used (noting that such products are banned by the “*Single-use and Other Plastic Products (Waste Avoidance) Act 2020*”);
- avoidance of single use plastic water bottles (for instance, use of glass bottles for water pitchers at conferences/functions);
- avoid use of paper napkins by using washable cloth napkins instead;
- use of cloth bags for collection of linen, towels and guest laundry items instead of plastic bags; and
- minimising printing of paper where possible (such as issuing of receipts/invoices via email or phone messaging, use double sided printing, etc.).

5.2 REUSE AND RECYCLING

In order to maximise opportunities for reuse of waste materials on or off site, waste streams are to be separated (during both construction and operational phases). Waste streams will be segregated into appropriate dedicated bins and/or storage areas within the site and, where not able to be reused within the site, transported to designated waste facilities (where possible, recycling facilities). In particular, during both construction and operation, waste material should be reused or recycled where possible including clean fill, concrete, brick, timber, metals, plastics, cardboard/paper and glass.

Segregation of waste streams will occur at the source (where practical) to minimise additional handling and inefficiencies. For instance, waste bins within tourist accommodation rooms will allow for segregation of general waste from recyclables to minimise waste to landfill and ease of waste separation by staff. Similarly, interim waste storage within kitchens, bars etc. will also include provisions for segregation at the source prior to transfer to the waste storage and collection areas.

Table 2 illustrates key opportunities for recycling and reuse associated with the operation of the development.

Table 2 - Recycling and Reuse Opportunities

Waste Type	Recycling/Reuse Opportunity
Clean Fill	Reuse within site or transport to other project sites for use
Rocks/Stones	Reuse within landscaping on-site or transport to other sites for use
Vegetation Trimmings/Grass Clippings	Mulch/compost and reuse for landscaping on-site
Waste Concrete or Bricks	Reuse within site, transport to other project sites for use or recycling facilities
Scrap Metal	Transport to scrap metal recycler
Timber Waste	Mulch on site and reuse for landscaping (if possible), pallets to be returned to supplier for reuse, other timber transported to salvage resellers
Food Supply Containers (Foam or Cardboard Boxes)	Returned to supplier for reuse
Recyclables (Glass, Cardboard, Plastic, Cans etc.)	Transport to recycling facilities
Green/Organic/Food Waste	Compost on-site where possible or transport to organic recycling facilities
Other (Batteries, Cartridges, Electronics)	Transport to recycling facilities

5.3 TREATMENT AND DISPOSAL

Where possible, waste materials should be reused on-site. For waste materials that cannot be used within the site, these will be collected by private waste contractors for off-site reuse and recycling (where possible) and final disposal (when reuse or recycling is not possible).

To manage the treatment and disposal of waste material during the construction and operational phases of the develop, the following measures will be implemented:

- waste material that cannot be reused or recycled will be clearly separated from those materials that can be;
- storage bins for all waste streams will be clearly signed/labelled to ensure mixing of waste types does not occur;
- staff (including cleaning and maintenance contractors) will be inducted in respect to the WMMP, its principles and the required waste management practices for the development; and
- hazardous materials will be disposed in accordance with relevant legislation and guidelines.

Waste contractors (including transport providers) shall be appropriately licenced for the removal and treatment of waste materials collected from the site. Similarly, facilities utilised for recycling and/or disposal shall also be licenced.

6. REVIEW

Given the construction contractor has not yet been selected and detailed construction methodology is not yet available, it is desirable that this WMMP is reviewed (and updated if necessary) prior to construction. This could be undertaken in conjunction with the preparation of a Construction Environment Management Plan (CEMP) for the project.

Similarly, the operator of the tourism accommodation has not yet been confirmed and, once identified, it would be desirable that the WMMP be reviewed and updated (if necessary). Many tourism accommodation operators have similar waste management policies and plans and there would be an opportunity to align and refine them with the WMMP (and vice versa) prior to opening of the facilities.

In addition, it is desirable that the WMMP be periodically reviewed once the development is operational to ensure that best practice measures are undertaken, relevant legislative requirements are met (particularly when these change over time) and that the objectives of the Plan remain relevant and are adequately addressed. Periodic review will also allow opportunities for emerging and future technologies (such as small scale waste to energy technology) to be considered for the site once feasible for implementation at such a facility.