

16.0 WASTE MANAGEMENT

16.1 INTRODUCTION

The majority of waste arising on St Helena is disposed of in a landfill site at Horse Point (see Figure 16.1 in Volume 3 of this ES). Two studies covering waste management on St Helena have recently been completed on behalf of DFID and SHG. The studies aimed to assess the lifespan of Horse Point landfill and to develop a strategy for improving the existing solid waste management practices so as to increase the lifespan of the landfill.

The construction of the proposed airport and supporting infrastructure has the potential to significantly increase the pressure on the existing waste disposal facilities on the island. This chapter identifies the measures that will be put in place to ensure that the waste arising during construction and operation is minimised, reused and recycled wherever possible.

16.2 APPROACH

16.2.1 Methods

The following approach has been taken to the assessment of waste management issues:

- A review of the existing waste management facilities on St Helena has been undertaken. This has also identified the main problems St Helena currently faces with regard to waste handling and disposal;
- The types of waste likely to arise during construction and operation of the airport and supporting infrastructure have been identified along with the potential effects these may have on existing facilities and other possible disposal routes;
- A review of the proposed solid waste management strategy which will implement improvements to St Helena's existing waste management practices has been carried out;
- Mitigation measures to manage and reduce the potential adverse effects that the contractors' waste arising may have on the Island's existing waste management facilities have been identified;
- The potential residual effects during construction and operation / Permanent effects are predicted.

In describing existing facilities, and possible future changes to solid waste management practices on the island, the following sources of information have been reviewed:

- Jacobs Gibb Ltd (2003) – Integrated 30 Year Waste Management Strategy and Action Plan for St Helena. Contract Ref CNTR 013019; and
- Ti-UP Resources Centre on behalf of The Government of St Helena and the Department for International Development (2007). St Helena Access Project Infrastructure Review, Final Draft – February 2007

Both of these reports highlight concerns surrounding the projected lifespan of existing waste management facilities on the Island. The key findings from these reports have been summarised in section 16.3.

There is no specific policy guidance for waste management on St Helena. However, Policy A3 of the LDCP2007 states that *“Proposals for airport construction (including any temporary runway) must be accompanied by an Environmental Impact Statement, to include:(e) Measures to handle waste materials in an appropriate manner.”* In response to this requirement an outline Waste Management Plan is included in this chapter.

16.2.2 Limitations

The assessment of the significance of effects relating to waste management is normally determined according to the ability of the facilities to cope with the additional arisings. The need for new facilities and the subsequent environmental effects associated with managing these facilities is also normally be taken into consideration. Estimates of the likely quantities of waste arising as a result of the Contractor's activities during construction and operation are not currently available. Therefore, this chapter has been prepared without the benefit of knowledge relating to the specific types and volume of waste likely to be generated by the construction or operation activities. Due to these limitations it has not been possible to fully assess the residual effects of waste in terms of the capacity of existing facilities to handle the potential quantities that may arise. Emphasis has, therefore, been placed on the mitigation and management of waste arising to ensure that any effects are minimised throughout the construction and operation of the scheme.

16.3 EXISTING FACILITIES AND PROPOSED CHANGES

16.3.1 Existing Facilities

The approximate locations of waste management facilities mentioned in this report are shown on Figure 16.1 Location of Waste Management Facilities, Volume 3 of this ES. Table 16.1 provides a summary of the operations and the limitations associated with each of the existing waste management facilities on St Helena (as identified in the studies referred to in section 16.2.1).

Table 16.1 Existing Waste Management Practices

Facility	Summary of Operation and Limitations of the Facility
Landfill Site	<ul style="list-style-type: none"> ■ The Island currently has one main waste handling facility, a landfill at Horse Point near the Millennium forest and approximately 1 km from Prosperous Bay Plain. ■ Waste disposal has been carried out at this site since the mid-1980s and it is operated by the Public Health Department. All wastes arising on the Island (Municipal Solid Waste, the greater part of which is domestic waste) are deposited at this site which is situated on an eroded valley. ■ The method of disposal adopted involves deepening and infilling existing erosion channels, followed by covering of the wastes with excavated overburden. ■ A deep burial area for the reception of asbestos waste has been designated but this is not viewed as satisfactory in the longer term. A further area has been designated for the reception of bulky waste. ■ Minimal engineering design works have been undertaken on the site. It has no on-site management for leachate or landfill gas production. ■ Following a report by Jacobs Gibb 2003, steps have been taken to improve the situation particularly in the management of records and upgrading site operations and practice.

Facility	Summary of Operation and Limitations of the Facility
Incinerator	<ul style="list-style-type: none"> ■ There is one thermal treatment plant (incinerator) in Rupert's Valley which has been in operation since 2002. This is a Dry Waste Incinerator that is largely used for medical wastes at the moment although some obsolete pesticides and chemicals are also disposed of in the incinerator. ■ There is also an old incinerator unit at Donkey Plain which is currently not in use. ■ A proposal to upgrade the Rupert's Valley incineration facility is currently being considered by SHG.
Waste Oil Facilities	<ul style="list-style-type: none"> ■ Waste oils are collected and shipped off the Island on the RMS St Helena for disposal / re-use in South Africa. ■ This occurs at a level of around 12 drums every 3 weeks and originates mainly from the power station. ■ Until recently this operation has been undertaken gratis by the RMS although the costs and practicalities of doing so are currently changing due to the increasing costs of transportation and increasing restrictions in the market for waste oil products in South Africa.
Facilities for Disposal of Cars and Tyres	<ul style="list-style-type: none"> ■ Car chassis are dumped on the sea bed to create an artificial reef in the Breakneck Point area. This normally occurs once per year – involving approximately 20 vehicles. ■ In addition SHG is also currently replacing its vehicle fleet and the old equipment is being stockpiled which may increase pressure on the bulky waste disposal. ■ There are currently no facilities to dispose of tyres on the Island and they are stockpiled.
Hazardous Waste Facilities	<ul style="list-style-type: none"> ■ There are no facilities on St Helena for the treatment or disposal of hazardous waste.

16.3.2 Proposed Changes to Existing Waste Management Practices on St Helena

The recent report prepared by Jacobs Gibb referred to in section 16.2.1 established that although waste on the Island is managed to as great a degree as possible the core problem relates to the sustainability of waste disposal operations. There is no formal management plan or strategy for St Helena's waste.

Waste generation projections show that if current waste management practices (i.e. landfilling the majority of waste) continue, the lifespan of the Horse Point landfill will be quickly diminished. The Jacobs Gibb Report identifies an expected lifespan of the Horse Point landfill to be 30 years. It is considered that this would be reduced to 19 years or less if waste management practices on the island did not change significantly.

Currently the Horse Point landfill is the only identified waste disposal site in the LDCP, 2007. Additional land that could be allocated for another landfill facility in the foreseeable future has not been found. SHG are seeking to maximise the lifespan of the present landfill.

A strategy for solid waste management based on the recommendations of the Jacobs Gibb Report will be implemented by SHG. This strategy will address issues relating to waste minimisation, collection, recycling, treatment and disposal. The basic principles of the strategy relate to:

- Introducing alternative waste management options, particularly relating to waste reduction and waste re-use that will limit the amount of waste that needs to be landfilled.
- Ensuring that waste management operations are as efficient and effective as possible.
- Promoting changes in current practices, adoption of alternative waste management options and discontinuation of poor waste management practices.
- Ensuring that waste management operations satisfy all environmental protection requirements.
- Ensuring that waste management operations satisfy all health and safety requirements.

The strategy aims to put in place the necessary infrastructure, facilities, systems and procedures required to establish improvement in waste management practices.

The solid waste management strategy aims to evolve as time progresses to adapt to changes as the island develops. The Jacobs Gibb Report states that *‘any strategy must be reactive to changes which occur, and thus will need periodic review with revisions adapted where appropriate’*. It will be closely monitored, with annual reviews being undertaken, so that the solid waste management strategy (SWMP) can be adapted as additional information becomes available. Table 16.2 summarises the main initiatives to be implemented under the SWMP.

Table 16.2 Summary of Initiatives to be Implemented under the Solid Waste Management Strategy

Initiative	Summary of scope and aim
Bio-degradable products	<ul style="list-style-type: none"> ■ Plastics (such as plastic bags) used on the Island are not bio-degradable. In conjunction with other relevant environmental agencies, the SWMP will continue to assist the promotion of the use of bio-degradable products to primarily safeguard the environment. This has been partially successful in the withdrawal of plastic carriers from retail outlets.
Recycling	<ul style="list-style-type: none"> ■ Of the total municipal solid waste stream, it is estimated that around 20% comprises glass, primarily bottles of which the main component is supplied by South African Breweries. Glass can be crushed for aggregate; however, St Helena already has ample sources of aggregate and only a modest demand. The main option would therefore be to re-export glass products for recycling. ■ Metal products (consumer durables, cars, food tins and soft drink cans) comprise around 15% of the total municipal solid waste stream. Similarly, the processing of these items on-Island would be expensive, and there is little subsequent demand on-Island. The main option would therefore be to re-export for recycling. However, the cost of transporting a container will need to be taken into consideration.
Waste Segregation components	<ul style="list-style-type: none"> ■ The SWMP will aim to provide waste containers to promote and encourage waste generators to segregate waste for reuse and recycling. The provision of containers for households for waste segregation will be done initially as a pilot scheme to determine the feasibility of any potential programme. If successful, this scheme would be extended to the rest of the Island. The SWMP also aims to provide waste receptacles for recyclables, i.e. paper, glass, metals, organic material, etc. as a component of addressing the feasibility of recycling both on-island and off. These receptacles will be placed at strategic points within communities or businesses to provide easy access for specific waste streams. These receptacles will provide an infrastructure and enforce the recycling message under the public awareness programme for waste minimisation.

Initiative	Summary of scope and aim
Composting - At home	<ul style="list-style-type: none"> ■ The SWMP will encourage ‘at home’ composting as the preferred option to the ‘at landfill’ option which will require separate collections and also on-site sorting. It is therefore recommended that household-produced organic waste (including vegetable peelings, fruit and vegetables, food waste and domestic garden waste) should be used for home composting, as separation from the waste stream after collection is neither practical nor economic. This would be a relatively new concept, although some households do currently undertake home composting. ■ The SWMP will aim to provide a limited number of compost bins to households, particular in built up areas, as a pilot scheme to encourage home composting. It will also undertake educational programmes to raise awareness of the principles of composting, especially if using kitchen wastes, food scraps, waste vegetables, etc, to avoid causing smells, flies and rodent problems.
Composting at Landfill	<ul style="list-style-type: none"> ■ It is estimated that 500-700 tonnes of compost could be produced per annum based on current levels of green waste. It is anticipated that these levels will continue in the future, if not increase as further development takes place on the Island. There is then potential for a composting scheme which will reduce the quantity of green waste for disposal. The SWMP will therefore provide an ‘at landfill’ composting facility, including a shredder, for this purpose. ■ In addition to the green waste, the compost facility could utilise the sludge deposited at the Horse Point landfill (approximately 210 tonnes per annum) as a medium to accelerate compost production.
Land Restoration	<ul style="list-style-type: none"> ■ In order to incorporate good environmental and health and safety practices, the waste management facilities are to be operated under a clearly defined and documented management plan that will include plans for land restoration post landfill. This will apply to the former Donkey Plain tip, the current landfill at Horse Point and the proposed bulky waste facility at Bradleys. <ul style="list-style-type: none"> - <i>Donkey Plain</i> The former tip at Donkey Plain consisted of waste deposited in a gully, which was partially covered with earth and soil. The Jacobs Gibb Report noted evidence of vehicle parts, building rubble and domestic appliances, indicating the area was still being used periodically to dispose of waste. Since the Jacobs Gibb Report was published, the former Donkey Plain tip has been partially restored by pushing waste to the lowest point of the gut and covering this with fill. There is already significant re-growth of vegetables in the vicinity of the former landfill areas which acts as a deterrent to further fly-tipping. In addition, it has the effect of binding the soil and minimising erosion. Further plans for land restoration at Donkey Plain include encouraging some form of ground cover through natural regeneration of vegetation in the area. Types of vegetation will comprise of hardy scrub plants suited to the arid area of land. - <i>Horse Point</i> The Horse Point landfill site has been progressively covered with excavated rock, earth and clay as part of the current site

Initiative	Summary of scope and aim
	<p>operations. This developmental filling of Horse Point lends itself to progressive restoration by re-vegetating filled land. Improvements to the overall aesthetic appearance of the landfill are also proposed.</p> <p>Site restoration and improvement measures, including clean-up of the rubbish in the gut running adjacent to the north-west site boundary will improve the overall aesthetic appearance and tidiness of the landfill.</p> <p>The site restoration plan will take into account the visual impact of the location and also protection of the adjoining lands, bearing in mind environmental sensitivities, particularly the Millennium Forest, endemic Wirebird and Geomorphological features known as Artist’s Palette in relation to tourism development and protection of endemic species.</p> <ul style="list-style-type: none"> ■ This component of the SWMP will be carried out jointly between EHSSD and ANRD. The compost produced from the Horse Point compost facility will be used to provide cover material for the landfill as well as a valuable source of mulch and compost for use as a soil conditioner.
Bulky Waste facility	<ul style="list-style-type: none"> ■ Due to tourism development and political pressure, there is an increasing demand to dispose of unsightly large items of waste. Bulky waste is considered to be an escalating problem that needs to be addressed in order to ensure the longevity of the facilities at the Horse Point landfill. ■ Currently, inert items of bulky waste, e.g. vehicle shells, are deposited at sea to form an artificial reef but polluting waste must be landfilled. Bulky waste items are disposed of in a separate trench to the domestic waste at the east side of the Horse Point landfill. . This would significantly reduce landfill space due to the physical size of the waste. ■ An area near the Bradleys Government Garage approximately half a kilometre from the Horse Point landfill site has been identified as a possible disposal site for bulky waste.

16.4 CONSTRUCTION, PERMANENT AND OPERATIONAL EFFECTS

Construction and permanent phases of the airport and supporting infrastructure are considered together. This is because in almost all circumstances waste generated during construction will need to be dealt with on a permanent basis.

16.4.1 Potential Effects

A list of types of waste materials which are likely to be generated during construction is presented in Appendix 16.1, Volume 4 of this ES. The types of wastes range from inert to hazardous materials. Examples of inert waste include a proportion of the material cut from the land during earthworks on Prosperous Bay Plain which may not be suitable for use in Dry Gut. Other wastes include domestic waste arising from the Contractor’s workforce and hazardous waste such as, waste fuel, chemicals and oil. The quantities of these waste types likely to be generated are not known at present.

Likewise a list of types of waste materials which are likely to be generated during operation is presented in Appendix 16.1. The types of wastes range from domestic waste, packaging and hazardous materials arising from maintenance and operation of the proposed Airport and Supporting Infrastructure. It is expected that waste will increase as the number of aircraft and passengers visiting the airport increase over the years of airport operation.

Although the volume of waste likely to be generated by the Airport operation itself may not be significant, the nature of some of the potential hazardous wastes (particularly from chemicals, oil based products and oils captured by the pollution control interception in the drainage system) will cause additional pressure on the island's current waste handling capability. This has been considered and mechanisms for waste management, including storage, handling and disposal have been included in an outline Waste Management Plan (WMP) described in section 16.6 below.

Once more information relating to the quantities and types of waste likely to be generated during construction and operation are available from the Contractor, the following key issues will be addressed by the WMP described in section 16.6:

- The need to use existing facilities and the subsequent reduction in the capacity of existing waste management facilities
- The need for new facilities, and the effects associated with waste management activities (incineration, landfill, recycling etc.) on the wider environment
- The effects of transporting waste off island.

16.5 MITIGATION OF CONSTRUCTION AND PERMANENT AND OPERATIONAL EFFECTS

16.5.1 Background

The Contractor is required to prepare a WMP. This will be prepared in close consultation with SHG's Environmental Health Section of the Public Health and Social Services Department (PHSSD) responsible for waste management and the Environmental Coordinator (ECO). The Contractor will take the following into consideration when preparing their WMP:

- Existing Waste Management Facilities on St Helena
- Proposed Changes to existing Waste Management practices being brought about through implementation of the SWMP.
- All wastes produced by the construction and operation of the proposed airport and supporting infrastructure will be managed by the Contractor. St Helena's facilities currently in operation or proposed facilities cannot be relied on.

The Contractor will be required to consult SHG's PHSSD to maximise the potential mutual benefits to both SHG and the Contractor, from the joint usage of certain facilities. SHG will consider any proposals made by the Contractor which provide economical and environmentally advantageous waste proposals for the Island's community. Proposals will involve close and on-going liaison with the community, PHSSD and the ECO throughout the project.

16.5.2 St Helena Access Environmental Management Plan – Stage 1 (EMP)

Given the limited capacity and constraints of the Island's existing waste management facilities to absorb and handle waste arisings, sections 2.8 and 3.5 of the EMP (Volume 5 of this ES) contains a requirement that the Contractor be committed to minimise as far as possible any residual waste materials for disposal on-Island. To do this, the EMP requires the Contractor to prepare a WMP as part of its work programme. The WMP will be submitted to SHG and DFID for evaluation and approval. The Contractor will also be required to resource, manage and deliver this WMP which will be subject to monitoring from SHG and the Engineer as part of the EMP.

The EMP requires the Contractor to submit an initial approach to waste management within their tender submissions. The intention will be to ensure that the Contractor takes on board the issues surrounding the handling of waste and builds the issues into their cost and activity programmes as far as possible. In doing so the Contractor will need to demonstrate a responsible duty of care with regard to waste management issues.

The Contractor's approach will be developed in more detail, as the WMP, after the contract has been awarded. The volumes and waste profiles will become clearer at that stage as they will be based on the scheme proposed by the Contractor and developed through detailed design.

In the absence of specific legislation for St Helena, waste shall be managed in accordance with relevant United Kingdom (UK) and European legislation, statutory guidance, codes of practice and technical guidance etc.

16.5.3 Core Waste Management Principles

The WMP will be developed in accordance with the following waste management principles:

- Waste Reduction and Minimisation
The Contractor shall put in place measures to reduce the production of waste at source through his design and management procedures,
- Re-use and Recycle
- Treatment on or off Island
- Safe Disposal on or off Island

The WMP shall set out anticipated targets for the recycling of construction and operation wastes and the incorporation of recycled materials into construction. These targets shall be monitored and revised throughout the contract period.

It is recognised that the likely balance for the waste management principles outlined above, will only become clear as specific airport design and construction information develops. The balance will depend on a mixture of economics, practical technologies suitable for the Island's conditions, the type, nature and quantities of the waste arisings and due regard to the limited capacity of the Island to deal with each of the wastes types and quantities.

The Contractor will put in place a framework to minimise the amount of waste produced and to maximise the segregation, re-use and recycling of waste. The means of segregating waste for re-use or recycling will be put in place by the Contractor either at

source or through a waste separation process appropriate to the facilities available on the Island. The Contractor will liaise with the aircraft operators to ensure that the maximum amount of container and packaging re-use is achieved.

16.5.4 The Waste Management Plan

16.5.4.1 Phasing

The WMP should distinguish between the different phases of the airport and supporting infrastructure project, namely:

- The Design Phase;
- The Construction Phase; and
- The Operational Phase.

The types, quantities and characteristics of the wastes generated during the construction and the operation phases of the Airport and supporting infrastructure project will be different and separate WMPs will be developed for the phases.

The WMP be updated to reflect any changes in waste types, quantities, characteristics and treatment / disposal methods during design, construction or operation of the Contract.

16.5.4.2 Responsibilities

The WMP will identify:

- Who will be responsible for the development and implementation of the WMP through the design, construction and operation phases;
- The roles and responsibilities of those involved in the development and management of the WMP; and
- How the development and implementation of the WMP will be reviewed, monitored, recorded and reported.

16.5.4.3 Scope of the Waste Management Plan

Appendix 16.1 summarises the guidance for preparing the WMPs. The guidance covers the following:

- Requirement to identify specific waste types, quantities and treatment / disposal options.
- Requirements to segregate, contain, adequately store and label waste.
- Requirements for waste transfer – highlighting that the Contractor will be responsible for collection and transfer of all wastes.
- Requirements for waste treatment - The Contractor will consider potential opportunities for joint working with SHG in relation to waste issues. These will aim to minimise waste, recycle and / or recover value from waste and treat wastes to reduce their environmental impact and the associated pressure on existing waste management facilities on the island.
- Requirements for waste disposal including that of specific waste streams such as disposal of surplus inert wastes and spoil, disposal of chemical, oil and fuel wastes, hazardous wastes and compostable wastes.
- Requirements for plant and equipment.
- Requirements for contingency plans - including for example, unexpected increases in waste arisings, etc.

It is considered that the export of all waste arising from the construction and operation of the airport will not be feasible. Equally the potential use of existing waste disposal facilities on the island is at present unclear and will depend on the proposals for treatment and disposal put forward by the Contractor in the WMP.

With the exception of unsuitable, inert material from the earthworks, ideally the majority of all wastes would be removed from the island. It may be the case that a percentage of these materials would be economically useful for the Island and preclude the exploitation of other resources and/ or transportation. A management procedure for these types of wastes, if identified, will be included in the WMP.

Disposal mechanisms shall be assessed and managed to the point of disposal. It will not be acceptable for example to merely 'remove' any issues to another territory which may itself have waste disposal issues without consideration of staged disposal and waste management options.

The WMP will therefore try to estimate the quantities and characteristics of the various types of waste identified which may require disposal to landfill, after minimisation, recycling, recovery, treatment and export. These proposals will be reviewed and considered by SHG. The Contractor would also consider whether landfill upgrade works would be feasible as part of their strategic waste approach.

16.6 RESIDUAL EFFECTS

Residual effects of the construction and operation of the proposed airport and supporting infrastructure cannot be assessed accurately at this stage due to the types and quantities of waste arisings being currently unknown. It is intended that through the implementation of the EMP, waste will be managed in a manner which avoids or reduces waste management effects and WMP to a level which is minor or negligible. However, due to existing constraints regarding waste management facilities on the Island there remains the potential for significant effects, as a result of the need to provide new facilities to dispose of or otherwise manage waste materials, particularly those arising during construction.

16.7 SUMMARY

Any substantial increase in waste generated both during the construction and the future operation of the airport could impact on the remaining lifespan of the existing waste management facilities on St Helena. The management of construction wastes will therefore be carried out so that the existing problems relating to the Island's limited waste disposal facilities are not exacerbated in the short or long term.

The Contractor will put in place policies and actions to minimise the amount of waste produced and to maximise the re-use and recycling of waste. He will be required to prepare a Waste Management Plan in close consultation with SHG. The Contractor will put in place the means of segregating waste for re-use or recycling, either at source or through a waste separation process, appropriate to the facilities available on the island. The Contractor will liaise with the airlines to ensure that the maximum amount of re-use is made of containers and packaging used by the aircraft operators.