7 Construction Activities

7.1 Introduction

This section describes the construction operations and phasing for the waste management facility and outlines the measures to be taken to ensure that the impact of the construction activities is minimised.

7.2 Geotechnical Investigation

A preliminary soil and hydrogeological investigation was carried out on the site, which included drilling of boreholes and excavating trial pits. The results of the site investigation are described in more detail in Chapter 11.

It is believed that, in the past, the hillside at the site followed the gentler slope of the surrounding land. Anecdotal evidence suggests that substantial quantities of material were removed from the site and used for reclamation purposes elsewhere in the Ringaskiddy area, thus creating the escarpment now evident on the site.

The topsoil layer is relatively shallow over most of the site. This layer is underlain by soft silty clays, with some fine sands and gravels. These are unsuitable for foundations. Depth to the bedrock varies across the site, from 1.0m below ground level (bgl) at the northern end of the site where material has been removed in the past, to greater than 9.0m bgl as one approaches the southern boundary.

7.3 Duration and Phasing

It is envisaged that the waste management facility will be developed in two phases. The external works and the buildings will be constructed and the mechanical plant for the fluidised bed furnace and flue gas cleaning line of the waste to energy plant will be installed in the first phase. The waste transfer station and the community recycling park will also be constructed in phase 1. The mechanical plant for the moving grate furnace and the its flue gas cleaning line will be installed in phase 2.

The schedule for the construction and commissioning of the first phase of the waste management facility is approximately 24 months. The second phase will take approximately 6 months. The main stages of the construction are anticipated to be as follows:

Phase 1

- Erection of site compound and temporary fencing
- Diversion of existing services as necessary
- Strip topsoil
- Earthworks and site re-grading
- Construct earth retaining structures
- Construct foundations
- Construction of bunker and underground holding tanks
- Erection of superstructure such as columns, walls, beams and suspended floors
- Construct ground floor slab

- External and internal finishes
- Installation of equipment for phase 1
- Form blank connections for phase 2 equipment
- External works including road works and landscaping
- Testing and commissioning of phase 1 equipment.

Phase 2

- Installation of equipment for phase 2
- Form connections to systems shared with phase 1
- Testing and commissioning of phase 2 equipment.

Some of the phase 1 and phase 2 activities may overlap and the sequence may alter to suit the construction schedule.

7.4 Site Preparation

Site preparation will involve the re-grading of the eastern part of the site for the construction of the waste-to-energy building. The road profile will require some cut and fill to be carried out. The middle of the site between the bottom and top of the escarpment, will require significant earth retaining structures. Excavation will be minimised at the high level along the southern edge of the site, but some earth retaining structures will be required at the site boundary. Parts of the waste to energy building will be up to 5m below the final ground floor level. These zones will be excavated and retaining walls constructed to support the adjacent ground. The site for the waste transfer station/community recycling park will also require some re-grading and earth moving.

It is anticipated that most of the material excavated will be reused elsewhere on the site, thereby minimising the need for removal off-site. Material that is taken offsite will be suitable for reuse as fill. Any material which is not reused will be disposed of at a licensed waste management facility.

7.5 Construction Methods

The construction strategy for the proposed Waste Management Facility provides for techniques that will afford safe, fast and cost effective methods of working.

In-situ concrete will be used to form foundations. It will also be used to form ground bearing floor slabs, upper floor suspended slabs and earth retaining structures. Rock anchors may be used, if suitable, in the earth retaining structures. It is likely that all concrete will be brought to site ready-mixed in trucks. The concrete may be placed directly from the trucks, or it may be pumped or be placed by skips carried by a crane. It is envisaged that some of the minor structural elements (e.g., non-load bearing walls) may be constructed in concrete block work. Underground tanks and chambers will be constructed of insitu concrete and will be designed as water retaining structures to the relevant codes.

The superstructure for the waste to energy plant will be in structural steel. Deep steel trusses will support the roof structure. Steel members will be fabricated off site, in lengths that are safe to transport, and erected on site. The superstructure for the waste transfer station will be in structural steel with concrete floors.

7.6 Materials Source and Transportation

In so far as possible, construction materials will be from local sources. All imported fill material that will be used on site will be from approved sources.

7.7 Employment and Accommodation

Throughout the construction phase there will be some variation in the numbers working on site. For phase 1, a maximum of around 320 construction workers will be employed on site with around 250 on the day shift and the remainder working a night shift, at certain times when the construction effort reaches its peak. The peak work force for phase 2 will be in the order of 100.

Temporary office accommodation and other construction facilities will be installed on site for the construction phases. All temporary units will be of a high standard in accordance with statutory regulations as a minimum.

The co-ordination of people and materials on-site, will be one of the key activities throughout the construction phases. To ensure that construction workers do not create additional demand for parking in the vicinity of the proposed development, or cause obstruction on the adjacent road network, it will be a requirement that the building contractor provide adequate parking onsite or provide transport to the site for the workforce.

The site start time will ensure that construction workers arrive in the Ringaskiddy area prior to the morning peak hour for traffic on the road network. Typical working hours during the construction phases will be:

Start	Finish	
0700	1900	Monday – Friday
0700	1300	Saturday

However, as mentioned earlier, it may be necessary to work overtime or night shifts (including at weekends) at certain stages. Working outside normal hours may be necessitated through considerations of safety or weather and sub-contractor availability. Heavy or noisy construction activities will be avoided outside normal hours and the amount of work outside normal hours will be strictly controlled.

7.8 Dust, Noise and Traffic

7.8.1 Dust Minimisation

A dust minimisation plan will be formulated for the construction phases of the project, as construction activities are likely to generate some dust emissions. The potential for dust to be emitted depends on the type of construction activity being carried out in conjunction with ambient conditions including rainfall, wind speed and wind direction.

The potential for impact from dust depends on the distance to potentially sensitive locations and whether the wind can carry the dust to these locations. Most of the dust would be deposited close to the potential source and any impacts from dust deposition would typically be within a

hundred metres or so of the construction area. In order to minimise dust nuisance, a series of measures will be implemented as follows:

Roads

- site roads and the public road will be regularly cleaned and maintained as appropriate
- un-surfaced roads will be restricted to essential site traffic only
- any road that has the potential to give rise to dust will be regularly dampened, as required, during dry and/or windy conditions.

Vehicles

- there will be speed restrictions for vehicles using site roads
- vehicles delivering materials to site will be enclosed or covered with tarpaulins
- vehicles exiting the site will use a wheel wash facility if necessary.

Materials

- material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind
- water misting or sprays will be used as required if particularly dusty activities are being undertaken during dry or windy periods
- during movement of soil/fill material both on and off-site, trucks will be covered with tarpaulin, if required.

The above procedures will be a requirement of the contract documents, and will be monitored by the construction management team. The dust minimisation plan will be reviewed at regular intervals during the construction phases to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust nuisance through the use of best practice and procedures.

7.8.2 Noise

Construction noise will be kept to a minimum in accordance with BS 5228. Noise is dealt with in more detail in Chapter 8.

7.8.3 Vibration

It is anticipated that there will be no activities, which will generate significant vibration during the construction phases of the facility. Piling, if required, will utilise methods that will minimise the risk of vibration generation and will only be undertaken in day time.

7.8.4 Construction Access and Traffic

Construction traffic issues are dealt with in Chapter 6.

7.9 Construction Safety

As required by the regulations, a Health and Safety Plan will be formulated which will address health and safety issues from the design stages, through to the completion of the construction and maintenance phases. This plan will be reviewed as the development progresses. The

contents of the Health and Safety plan will follow the recommendations of the Guidelines to Parts I, II, III of the Safety, Health and Welfare at Work (Construction) Regulations 1995.

7.10 Waste Disposal

Materials that will need disposal from the site will include general construction debris, scrap timber and scrap steel, packaging materials, machinery oils and chemical cleaning solutions. These will be disposed of or recovered in accordance with SI 133 of 1997 and SI 165 of 1998. The following are some of the measures that will be taken to ensure that the site and surroundings are maintained to a high standard of cleanliness.

- a regular programme of site cleaning will be established to ensure a safe and orderly site
- if necessary, scaffolding will have debris netting attached to prevent materials and equipment being scattered by the wind
- food waste will be strictly controlled on all parts of the site
- mud on roads and footpaths outside the site will be cleaned regularly and will not be allowed to accumulate
- in the event of any fugitive solid waste escaping the site, it will be collected immediately and removed to storage on-site, to await disposal to landfill in the normal manner.

7.11 Services Requirements

7.11.1 Pipe Laying

Tie-ins to public utilities will be specifically designed and installed following approved methods.

7.11.2 Electricity

It is anticipated that the construction work for phase 1 will require a peak load of 500KVA. The requirement for phase 2 will be less, at 250KVA.

7.11.3 Water

The volume of water required during construction on an average daily basis, for phase 1, is estimated at approximately $10m^3$. For phase 2 the requirement will be an average of $2m^3$.

7.11.4 Surface and Foul Water Disposal

Temporary site sanitary accommodation will be connected to a holding tank which will be pumped out as required and disposed of in an appropriate manner. Any surface water that accumulates during the construction of the foundations, retaining walls or the main structure will be discharged via silt traps to the surface water drains in the adjacent public road.

7.12 Other Construction Impacts

Other impacts arising from the construction phases of the project are dealt with in specific chapters. There is an evaluation of the impacts on flora and fauna in Chapter 10. The protection

of surface water, groundwater and soils during the construction phases is described in Chapter 11. The impact on the archaeological and cultural heritage is addressed in Chapter 13.

In general it is anticipated, that with the proper management, the construction phases of the development will not have significant or long-term negative impacts.

7.13 Mitigation Measures

Every practicable effort will be made to ensure that any environmental impacts will be minimised during the construction phases of this project.

The construction planning will be geared towards keeping disruption and nuisance to a minimum. A dust minimisation plan will be formulated so as to lower the potential for dust generation from site activities. Likewise, appropriate measures will be taken to ensure that the site and the surroundings are maintained to a high standard of cleanliness.

Due to the nature of construction activities, there will be diesel-powered plant and machinery operating at the site for the duration of the construction phases. The storage of all fuels will be in bunded areas.

7.14 Residual Impacts

It is anticipated that with the proper construction management, there will not be any negative residual impacts arising from the construction of this development.