Appendix 9

Construction Management

5. Construction Activities

5.1 Introduction

This chapter of the EIAR describes the construction activities and sequencing for the proposed Ringaskiddy Resource Recovery Centre. It considers how the proposed development will be constructed, including duration, site preparation, services and utility requirements, import and disposal of materials and general construction activities for this type of development.

It is anticipated that, with the proper implementation and management of the construction activities described in this chapter the construction phase of the development will have no significant or long-term impact.

5.2 Geotechnical Investigation

In order to ascertain the underlying ground conditions onsite, preliminary soil and hydrogeological investigations were carried out on the site, which included drilling of boreholes and excavating trial pits. The results of the site investigations are described in more detail in **Chapter 13** ***Soils, Geology, Hydrogeology, Hydrology and Coastal Recession*** of this EIAR***.***

It seems likely that, in the past, the hillside at the site followed the gentler slope of the surrounding land, refer to **Section 13.3.2.4** in **Chapter 13**. 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. 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 close to the southern boundary.

5.3 Duration and Activities

5.3.1 Overview

The schedule for the construction and commissioning of the Resource Recovery Centre is approximately 31 months.

The road upgrade, associated road drainage and diversions of services will take circa eight weeks to complete. The diversion to the 220kV underground cables, if required would take circa four additional weeks. It is anticipated that the road upgrade, associated road drainage and diversions of services will proceed in advance of the main construction of the Resource Recovery Centre. Refer to **Section 5.3.2** below for further details. Of the 12-week duration period, Gobby Beach car park may need to be closed for up to six weeks to facilitate the construction works. However, access to the beach will be maintained for the duration of the works.

The placement of the sacrificial beach material (shingle) required for the coastal protection works will take approximately three weeks to complete. Refer to **Section 5.4.3** below for further details. It is envisaged that the coastal protection works will be undertaken towards the end of the construction phase.

It is envisaged that the main stages of construction will be as follows:

- Implement Japanese Knotweed management plan for construction phase, fence off infestation area along the western boundary of the site and continue with treatment, etc, as required. Note, advance knotweed treatment commenced in 2016 and will continue as required (Refer to **Section 5.12.7** below for further details).
- Construct temporary road to south of existing L2545 road,
- Upgrading the section of the L2545 road at the northern boundary, including upgrading the drainage and diversion of services,
- Construction of new site entrance,
- Diversion of existing services within the site, including the gas main, which lies close to the southern and eastern boundaries, and overhead power lines,
- Strip topsoil and vegetation,
- Bulk excavations and general site re-grading, including placing of fill in western field,
- Establish the initial contractor site compound, including the construction phase power supply, fencing and securing of the site,
- Construction of earth retaining structures, which will happen in tandem with bulk excavations and general site re-grading,
- Establish main contractors' compounds and laydown areas,
- Construction of foundations for main process building,
- Construction of bunker, underground holding tanks and drainage/underground services,
- Construction of ground floor slab of main process building,
- Installation of plant and equipment, which will be undertaken in tandem with external and internal completions and finishes,
- Erection of superstructure of main process building,
- External and internal completions and finishes of main process building,
- Construction of substation, administration building and other ancillary buildings,
- Installation of external plant and equipment,
- Construction of internal roads and parking areas,
- Underground services,
- Surface water drainage system,
- Foul drainage system,
- Connection to existing water and foul services,

- Fit-out and commissioning buildings and equipment,
- Erection of site fencing,
- Site landscaping,
- Placing of sacrificial material on the beach at the toe of the glacial till face at the eastern boundary of the site,
- Removal of contractor facilities and site hoarding.

5.3.2 L2545 Upgrade and Drainage Upgrade

Introduction

The proposed upgrade works to a section of the L2545 local road, which adjoins the northern boundary of the site, will consist of raising a section of the road to a maximum elevation of 3.45mOD, installing large diameter pipes to provide storm water storage and upgrading the surface water drainage. The likely duration of the works will be 12 weeks in total. This work will be undertaken in advance of the main construction works. The road and drainage upgrade are fully described in **Section 4.5.17** of **Chapter 4** ***Description of the Proposed Development,*** of this EIAR. A summary is provided below.

Outline description of L2545 upgrade – increase in road levels

The proposed L2545 upgrade works will include raising a 185m section of the road to a maximum height of 3.45mOD between the car park and the eastern end of the Hammond Lane Metal Company. This is approximately 1.0m above the existing road level. The road will be raised over a length of approximately 185m in order to ensure a smooth transition down to existing road levels, in accordance with road design standards. The recently constructed footpath on the northern side of the road will also be raised to the new road level.

Outline description of L2545 drainage upgrade

The proposed road drainage network upgrade will extend along the entire northern boundary of the Indaver site. The increased storage will be in the form of oversized pipes placed underneath the road. This is described further below.

A new linear concrete surface water channel, 260m in length, will extend from the western boundary (of the western field area) of the Indaver site, running along the southern edge of the L2545 until it meets the entrance to the Hammond Lane Metal Company. This section of the L2545 is currently super-elevated – i.e. the camber on the road falls from north to south, therefore surface water drains to the south. This section of the L2545 will not be raised as the existing levels are already above the predicted 1 in 200-year design tidal level (2.73mOD) and it will be protected to 3.35mOD by the proposed elevated section of road to the east. The new surface water channel will be drained at regular intervals by gullies which will outfall to the existing 450mm diameter surface water sewer beneath the road. Therefore, surface water will no longer flow from the road into the Indaver site (western fields) to the south.

The raised section of the L2545 between the car park and the eastern end of the Hammond Lane Metal Company will be drained by a kerb and gully sealed drainage system which will be connected to two new surface water pipes underneath the road.

The two 1500mm diameter pipes will be approximately 190m in length and will provide 660m^3 of surface water storage. There will be three large concrete chambers constructed on the line of the twin surface water pipes at the start middle and end of the run. The first two chambers will be situated in the road and the terminal chamber will be constructed at the entrance to the car park by Gobby Beach. The recently constructed surface water drainage system on the Haulbowline road will be diverted into the terminal chamber. This chamber will be connected to the existing 450mm diameter surface water sewer via a short length of new 450mm diameter pipe, a new Class 1 bypass hydrocarbon interceptor and a new manhole constructed on the line of the existing pipe. This will allow the upgraded surface water drainage system to discharge to sea via the existing 450mm surface water outfall at Gobby Beach.

All of the above works will be within Indaver ownership, apart from a small area in Hammond Lane ownership. Consent has been given by Hammond Lane to undertake these works.

Outline description of existing services along L2545

The known underground services are a 450mm diameter watermain, 220kV electricity cables, 4 bar gas distribution main, public lighting cables, Eircom underground cables, Enet fibre optic cables, private foul sewer and surface water drainage pipes. There is also an overhead electricity cable crossing the road.

Outline description of construction works required for L2545 upgrade

A construction traffic management plan will be implemented by the appointed Contractor in advance of commencing the works on site. Refer to **Section 5.12** below for further details.

Whilst the construction of the road upgrade and associated drainage upgrade can proceed in parallel with the construction of the waste to energy facility, the raising of the levels of the western field lands would require the road drainage works to be complete. Therefore, it is anticipated that the road upgrade and drainage works would be commenced at the beginning of the project and progressed to completion as soon as possible.

The first task of the road upgrade will be to construct a temporary two-way road, approximately 250m long, to the south of the existing road to create working space for the construction of the raised section of the road, the upgraded drainage system and the diversion of services. The traffic will be diverted onto the temporary road until the upgrade works have been completed. The construction traffic management plan will incorporate a temporary traffic management plan in accordance with **Chapter 8** of the ***Traffic Signs Manual (Department of Transport 2010)***. An initial site compound and site offices will be provided within the Indaver site to provide facilities for the workforce for the road upgrade works.

The existing services running along and adjacent to the road will be carefully set out and suitable working methods will be employed to ensure that the existing services are protected during construction.

There is an overhead electricity line crossing the road however only a marginal increase in road level (circa 100mm) is proposed at this location.

The public lighting columns at the northern edge of the footpath, on the northern edge of the road, will have to be raised to match the new road level and the associated duct chambers will also be raised to match the new footpath level.

New Eircom ducting is proposed for the northern road verge to allow Eircom cables to be locally diverted within the road. The gas distribution main will also be locally diverted within the road. The existing surface water drainage from the Haulbowline road will be diverted into the new surface water system. The 450mm diameter watermain will also be diverted along the section of road to be raised between the car park and east of Hammond Lane. This work will be undertaken in consultation with Cork County Council, which is acting as an agent for Irish Water. All of the utilities providers have been consulted in relation to the proposed diversions.

The 220kV power lines and corresponding ESB telecoms fibre optics cables beneath the L2545 may need to be raised as a result of the raising of the L2545.The worst-case option in terms of potential effects would involve diverting the cables into new ducts laid at a higher level underneath the raised section of road. Three new joint bays would be required to allow the raised cable to be jointed back to the existing cables at either end and to join the short length of new cable to the recovered length of cable respectively. The joint bays would be located in the existing road.

Diversion works to the remaining services are not envisaged, however some protection measures, such as cover slabs, may need to be employed.

Due to the presence of the existing services, it may not be possible to batter back the excavation for the large drainage pipes and therefore suitable trench supports e.g. sheet piles or large trench boxes may be used.

The 1500mm diameter pipes and the other pipes, road gullies and new underground services, including the new ducts and joint bays for the potential 220kV cable diversion will be installed and the trenches backfilled, and the new road surfacing will be laid using normal construction method and in compliance with the requirements of Cork County Council and Transport Infrastructure Ireland (TII) specifications. A temporary road surface will be provided which will be replaced with the permanent surface once the main construction project has been completed.

Provision for the site connections to the water main, telecommunications infrastructure and surface water and sanitary (foul) sewers will be made during road upgrade works.

Materials required

The road upgrade will involve the following quantities of bulk materials:

- Excavation of circa 3,050m^3 unsuitable material including circa 225m^3 bituminous macadam,
- Importation of 1,400m^3 pipe bed and surround material,
- Import 1,400m^3 select granular fill for new road construction,
- Importation of 370m^3 asphalt for new road.
- Importation of 1,000m^3 select granular fill for temporary road construction.

The imported granular fill for the construction of the temporary road may be reused for the construction of internal site roads.

All traffic movements associated with the import and export of materials have been included in the construction traffic impact assessment. Refer to **Chapter 7** (***Roads and Traffic***) for further details.

Details on materials import and export requirements and disposal are provided in **Section 5.5** below.

5.4 Site Preparation Works

Once the road upgrade has been completed, the site preparation will commence with the establishment of safe access and site roads. A perimeter fence will be erected around the construction site. Re-grading work will be required. Where feasible, excavated material will be retained on site, either in the eastern area or western field, for re-use as bulk fill or for landscaping. Details on material export requirements and disposal are provided in **Section 5.5** below.

All traffic movements associated with the import and export of materials have been included in the construction traffic impact assessment. Refer to **Chapter 7, *Roads and Traffic*** of this EIAR for further details.

It is anticipated that the bulk excavation will take approximately six months. The central part of the site for the waste-to-energy facility will require significant earth retaining structures. These will be constructed in tandem with the bulk earthworks and re-grading.

The material to be removed will comprise overburden and rock. Refer to **Chapter 13 *Soils, Geology, Hydrogeology, Hydrology and Coastal Recession*** of this EIAR for a description of the soils and geology underlying the site. The bedrock is comprised of sandstone/siltstone and mudstone. The top 0.5m to 1m of the bedrock is weathered and it is expected that it can be removed using a large excavator. It is expected that the remainder can be removed using chisel or hammer-operated rock breakers. It is anticipated that blasting will not be required. Refer to **Chapter 10, *Noise and Vibration*** and **Chapter, 8 *Air Quality*** of this EIAR for details on construction noise and dust effects and mitigation measures.

Rock crushing may be undertaken on site in order to make the excavated rock suitable for re-use as general fill. Crushed stone will need to be imported onto site. Materials required from quarries will only be sourced from quarries which are listed on the register maintained by the local authority. Further details on material import requirements are provided in **Section 5.5** below.

Site preparation works will also include the facilities for the contractors and the construction management team. These will include the following:

- Setting up of access control to the site.
- Site offices.
- Site facilities (canteen, toilets, drying rooms, etc.).
- Offices for construction management team.
- Secure compound for the storage of all on-site machinery and materials.

- Temporary car parking facilities.
- Permanent and temporary fencing.
- Site Security.

The western field will be used for the construction laydown areas and the construction facilities, following an initial phase of earthworks to raise the ground levels in this area.

5.4.1 Main Construction Works

Once site levels have been established by the initial bulk excavation works and construction of the retaining structures, the construction of the waste-to-energy facility will commence with the construction of the foundations for the building and equipment, the bunker and the tanks and services to be located under the ground floor. The upper floors and main building support structures will then be completed. Installation of plant and equipment will be undertaken in parallel. The contractor will work on the construction of the foundations and superstructure and installation of the equipment in the ancillary buildings, and the installation of the external plant and equipment, once construction of the waste-to-energy facility has progressed.

Site roads, car parks and site fencing will be completed, and the landscaping will be undertaken, when the main construction and equipment installation is completed, and commissioning is underway.

5.4.2 Construction of Grid Connection

The proposed development includes a grid connection to the boundary of the adjacent ESB Networks Lough Beg substation. The ESB Lough Beg substation is located on the eastern boundary of the Hammond Lane Metal Recycling Company Ltd. The lands over which the entire grid connection will be constructed lie within Indaver's ownership (save for a small section comprising associated works on the adjacent substation owned by ESB Networks). These works will be carried out by ESB Networks and do not form part of the planning application.

The grid connection will be made by running underground cables between the ESB Networks Lough Bed substation and the import/export substation on-site, east of the main site entrance. Underground cables will be laid, using normal construction methods and complying with ESB Networks requirements.

5.4.3 Coastal Defence Works

Approximately 1,100m^3 of imported rounded shingle of appropriate size will be placed, as sacrificial material, at the toe of the glacial till face on Gobby beach which forms the eastern boundary of the site. The works will extend along the beach from near the car park at the northern end of the Indaver site to the southern boundary of the Indaver site. The material will be deposited above the high water mark.

The placement of the sacrificial beach material (shingle) required for the coastal protection works will take approximately three weeks to complete. It is envisaged that the first instalment of the shingle will be undertaken towards the end of the construction phase.

The sacrificial material has been designed to remain on site and help lower the natural erosion rate over a number of years. However, the expected duration of the material cannot be determined since it depends on the occurrence of extreme wave events which are impossible to forecast. Therefore, it is anticipated that monitoring of the sacrificial material and the cliff face will take place on an annual basis. Replenishment of the material will be carried out as determined by the monitoring results. It is envisaged that replenishment may be required every two to five years, but it depends on the duration of the material remaining on site. The effects described below for the initial instalment of shingle will be repeated during replenishment.

The shingle, required for the coastal protection works will be sourced from a quarry which is listed on the register maintained by the local authority. The environmental effects associated with the registered quarry have already been assessed by the local authority under Section 261 of the Planning and Development Act 2000, as amended. The registered quarry will have similar geological properties to the material found on Gobby Beach so that the shingle chosen will match the existing material on Gobby Beach.

All traffic movements associated with the import of the shingle have been included in the construction traffic impact assessment. Refer to **Chapter 7, *Roads and Traffic*** of this EIAR for further details.

The imported shingle will be transported by road and temporarily deposited at the car park at Gobby Beach. A bulldozer will be used to spread the imported shingle in the designated area. It is anticipated that access for construction machinery across the beach will be facilitated by laying down temporary tracks.

To ensure the safety of the general public, it is envisaged that the area of the beach, in which the construction works will take place and the area of the car park in which the materials will be stored, and which will be used by the machinery, will be closed to the public for the duration of the proposed works, approximately three weeks. However, access to the rest of the beach will be maintained for the duration of the works.

The traffic movements associated with the coastal protection works have been included in the construction traffic impact assessment. Refer to **Chapter 7**, ***Roads and Traffic*** of this EIAR for further details).

5.4.4 Construction Methods

The proposed development will be constructed employing best practice in safety and efficiency.

In-situ reinforced concrete will be used to form foundations. In the parts of the site where the ground levels are raised, or where the bearing strata does not have the required geotechnical properties, foundations will be piled. In-situ reinforced concrete will be used to form ground bearing floor slabs, upper floor suspended slabs and earth retaining structures.

Soil nailing or rock anchors may be used for some earth retaining structures, where the rock is suitable. Underground tanks, chambers and process areas will be constructed of in-situ concrete and will be designed as water retaining structures to the relevant codes. Where required these structures will be double contained, using a high-density polyethylene or polypropylene liner.

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 hoisted 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.

The superstructures for the buildings will be constructed in structural steel. Steel members will be fabricated off site, in lengths that are safe to transport, and erected on site. Structural steel will also be used to support the process equipment and to provide access platforms.

The buildings will be clad in profiled metal cladding and the roofing will consist of profiled metal cladding or a membrane type system on and metal deck. Depending on the function of the buildings, the cladding and roof will be insulated.

Cranes will be a significant element of the construction plant and it is envisaged that various crane systems will be used for lifting materials in to place.

5.5 Material Imports and Export and Transportation

5.5.1 Material Imports and Transportation

The construction of the proposed development will require considerable movements of materials to and from the site. The selection and specification of construction materials will be informed by local availability of these materials. Materials will be sourced locally where possible. Within the necessary constraints of performance, durability and cost, construction materials will be sourced from local suppliers and manufacturers, where possible. Construction materials will be transported from the suppliers via the national primary route network as far as Ringaskiddy village and will use the L2545 from the Village to the site. Refer to **Chapter 7** ***Roads and Traffic*** of this EIAR for an assessment of the impact of construction traffic.

Almost 30,261m^3 of engineering fill and crushed stone will be imported onto the site. Of the 30,261m^3 of imported engineering fill and crushed stone required for the construction works, approximately 1,100m^3 consists of shingle required for the coastal protection works, approximately 4,796m^3 will be required for the road upgrade and approximately 24,365m^3 of engineering fill required for the site (over the eastern and western fields).

Materials required from quarries will only be sourced from quarries which are listed on the register maintained by the local authority. The environmental effects associated with the registered quarry have already been assessed by the local authority under Section 261 of the Planning and Development Act 2000, as amended.

All traffic movements associated with the import of materials have been included in the construction traffic impact assessment. Refer to **Chapter 7 *Roads and Traffic*** of this EIAR for an assessment of the impact of construction traffic.

It is envisaged that replenishment of the shingle for the coastal protection works may be required every two to five years, but it depends on the duration of the material remaining on site. The effects described for the initial instalment of shingle will be repeated during replenishment. There are a number of sand and gravel quarries located in the glacio-fluvial gravel channel extending from west of Classes, to the west of Cork City, to east of Midleton. Material from any of the gravel quarries will be a suitable source for the beach sacrificial material.

In the context of capacity of the market in Ireland for construction materials, the requirements of the construction phase will not be significant.

5.5.2 Material Exports and Transportation

The construction of the proposed development will require considerable movements of materials to and from the site. Most of the materials leaving the site will consist of soil and stones from the excavation works.

Where possible, excavated materials will be reused on site for backfilling purposes, re-grading and landscaping. However, it is expected some of the excavated material may not be suitable for reuse on site. Any excavated materials suitable for re-use may deteriorate due to poor materials handling, storage, and exposure to adverse weather conditions. In particular, where materials consist of high fines content and wet weather is experienced during the excavation activities, such materials may become unusable.

It is estimated that up to 74,664m^3 of surplus material will be removed from the site (including material from the road upgrade works). The clean and inert surplus excavated material, which is integral to the construction phase, may be reused as a by-product on other sites subject to Article 27 under the Waste Directive Regulations 2011 and notification to the EPA.

Where a re-use for the material cannot be found, the material may be sent to suitably permitted waste facilities or licensed soil recovery facilities in accordance with relevant waste legislation or disposed at suitable authorised waste facilities. The environmental effects associated with the suitably permitted waste facilities or licensed soil recovery facilities or authorised waste facilities will have already been assessed by the relevant consenting authorities. The impact of the traffic movements on the surrounding road network has been assessed in the construction traffic impact assessment in **Chapter 7 *Traffic*** of this EIAR.

It is unlikely that any contaminated material will be encountered (refer to **Section 13.3.2.2** and **Appendix 13.2**) however if it is, it will be disposed of to a suitable authorised waste facility, subject to the appropriate waste acceptance criteria at the receiving facility and in accordance with relevant waste legislation.

Section 15.5.2.9 of **Chapter 15 *Material Assets***, describes the surplus material management options (re-use, recovery, disposal) and outlines the criteria that the material must meet in order to be disposed of at such facilities.

All traffic movements associated with the export of materials have been included in the construction traffic impact assessment. Refer to **Chapter 7, *Roads and Traffic*** of this EIAR for further details.

5.6 Services and Utilities Requirements for Construction

5.6.1 Electricity

It is anticipated that the construction work will require a peak load of 300kVA. In liaison with the ESB Networks, a temporary transformer served from local supplies will be installed to provide part of this requirement. The remainder of the power required will be supplied by the use of on-site diesel generators.

5.6.2 Water Supply

The construction activities that will require water during the construction phase will be relatively small. The initial estimate of demand is approximately $10m^3$ per day, primarily based on the demand requirement for the construction workers and the associated support facilities. In agreement with Irish Water, water will be sourced from the existing water main located in the L2545 road to the north of the site where there is ample supply to meet this demand.

5.6.3 Storm Water and Foul Water Disposal

A dedicated holding tank for storage of construction foul effluent will be constructed prior to commencement of the main construction activities. The effluent will be regularly disposed of off-site by tanker by a licensed contractor to an approved licenced facility.

Storm water will be managed carefully during construction. In general, storm water will be infiltrated to ground via silt traps and managed soakaways. The laydown areas will be suitably drained and any areas which will involve the storage of fuel and refuelling will be paved and bunded and hydrocarbon interceptors will be installed to ensure that no spillages will get into the surface water or groundwater.

5.7 Employment and Welfare

Through the construction phase there will be some variation in the numbers working on site. It is anticipated that a maximum of 320 construction workers will be employed on site at any one time with around 250 workers working a daytime shift and 70 working a night shift.

Temporary office accommodation and other construction facilities will be installed on site for the construction phase. 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. The construction traffic management plan will designate traffic routes, timings and parking arrangements.

The site start time will ensure that construction workers arrive in the Ringaskiddy area prior to the morning peak hour for traffic on the local network. No construction vehicles will arrive or depart the proposed development site during the morning and evening peak periods (07:00-09:00 and 16:00-18:00) during the construction phase. Typical working hours during the construction phase will be:

Start	Finish	
0600	2000	Monday – Friday
0700	1300	Saturday

It will be necessary to work overtime (including at weekends) and night shifts at certain critical stages during the project. Consideration of safety, weather or sub-contractor availability is likely to necessitate working outside normal hours. Over the 31-month construction phase there will be up to eight weeks of night time working. Heavy or noisy construction activities will be avoided outside normal hours and the amount of work outside normal hours will be strictly controlled. Refer to **Chapter 7 *Roads and Traffic*** of this EIAR for further details on construction traffic.

5.8 Commissioning Phase

Following completion of construction and installation of equipment, and before operation of the facility commences, there will be a testing and commissioning phase. This phase will comprise:

- Installation compliance checks;
- Commissioning tests;
- Performance demonstration tests.

5.8.1 Installation Compliance Checks

This will be a process of systematically checking that all systems and equipment have been constructed, assembled, aligned and installed correctly, in accordance with the design specifications and drawings, and that all interconnecting pipe work, cabling and wiring has been installed in compliance with the design specifications and drawings.

5.8.2 Commissioning Tests

The function of each item of equipment and each system will be tested and verified, in a systematic manner, as being in accordance with the design and specifications. All the alarm and control systems and instrumentation will be tested to demonstrate that they are functioning correctly. Following these tests, each system will be checked to ensure that it is ready to be commissioned under operating conditions including using real materials, temperatures, pressures and voltages.

5.8.3 Performance Demonstration Tests

The facility's safety and fire prevention systems and the emission monitoring systems will be subject to the same rigorous testing protocols as the other systems in the plant.

In this commissioning phase, the individual items of equipment and systems will be tested under operating conditions using the materials, temperatures, pressures and voltages to which they will be subjected when in operation. Once the operation of all equipment and systems have been tested and verified individually, they will be integrated, and the operation of complete systems will be tested.

5.8.4 Incineration Plant Test Programme

It is likely to be a requirement of the industrial emissions licence that a test programme is undertaken to demonstrate the performance of the waste-to-energy facility, including operations, control and abatement systems, emissions, monitoring equipment and back-up systems. The test programme must be completed, and a report submitted to the EPA before normal operations can commence.

5.9 Construction Site Decommissioning

On completion of construction, all construction facilities and equipment such as plant, materials, signage, contractors' offices and laydown areas, etc. will be removed from site. Some contractor facilities will remain until the end of the guarantee period of the incinerator due to guarantee obligations of the contractors.

5.10 Potential Construction Effects

5.10.1 General

Every reasonable effort will be made to ensure that any damaging environmental effects will be minimised during the construction phase of the proposed development. The construction planning will be geared towards keeping disruption and nuisance to a minimum.

Environmental effects during construction will be mitigated or reduced where possible (refer to the individual chapters in this EIAR for specific mitigation measures).

In this regard, prior to the commencing any works on site, the CEMP included in **Appendix 5.1** of this EIAR will be finalised by the main contractor. Adherence to this plan will be a contract requirement and this will ensure good working practices are followed so as to minimise and manage any environmental effects arising from construction.

Potential construction phase effects are addressed in other chapters of this EIAR. For example, the construction phase effects on air quality, climate and noise and vibration are evaluated in **Chapters 8 *Air Quality*, 9 *Climate*** and **10 *Noise and Vibration*** of this EIAR respectively. Construction traffic is addressed in **Chapter 7 *Roads and Traffic*** of this EIAR. There is an evaluation of the construction effects on flora and fauna in **Chapter 12 *Biodiversity*** of this EIAR. The construction impact on the archaeological, architectural and cultural heritage is addressed in **Chapter 14, *Archaeological, Architectural & Cultural Heritage*** of this EIAR. Visual effects and lighting effects during construction are detailed in **Chapter 11 *Landscape and Visual*** of this EIAR. Potential construction phase effects on Soils, Geology, Hydrogeology and Coastal Recession are addressed in **Chapter 13 *Soils, Geology, Hydrogeology, Hydrology and Coastal Recession*** of this EIAR.

The potential cumulative effects arising during the construction phase are also addressed in **Chapters *7 Roads and Traffic*, 8 *Air Quality*, 9 *Climate,* 10 *Noise and Vibration, 11 Landscape and Visual,* 12 *Biodiversity,* 13 *Soils, Geology, Hydrogeology, Hydrology and Coastal Recession,* 14 *Archaeological, Architectural and Cultural Heritage,* 15 *Material Assets,* and 17 *Cumulative Effects, Other Effects and Interactions*** of this EIAR.

Specific construction phase mitigation measures are described in the individual chapters and general mitigation measures are described below.

5.10.2 Do Nothing Effects

If the proposed development did not go ahead, it is likely that the lands would remain the same or would be developed by some other developer for another industrial purpose. The road drainage would not be upgraded, and the road levels would not be raised. Consequently, the road would continue to flood following heavy rain and the road would be vulnerable to tidal flooding, particularly following a rise in sea levels due to climate change.

5.10.3 Predicted Effects of Decommissioning Phase

Decommissioning of the site will comprise two distinct phases, namely decommissioning (de-stocking, cleaning and equipment removal) followed by demolition of the existing buildings and structures on the site.

Phase 1 activities will include:

- Cancellation of waste deliveries to the site,
- Incineration of all waste in stock on site followed by cessation of the incineration process,
- Removal off-site of all raw materials, other process materials and residues,
- Decontamination, using chemicals and or power washing, and decommissioning of all plant and equipment,
- Removal of sludge from tanks and interceptors,
- Cleaning of all remaining equipment, pipelines etc. and buildings,
- Removal of specialist equipment, spare parts, and storage tanks from site, and

- Retention of buildings, roads, hard-standings and site fencing.

The site surface water drainage system, site fire safety systems and security systems will remain in place until the decontamination and decommissioning activities have been substantially completed. This will ensure that the decontamination and decommissioning activities will not give rise to a significant risk of environmental pollution.

Circa 9,870 tonnes of materials and wash waters will be removed from site during the decontamination phase. This represents 494 No. truckloads of material to be removed from the site over a three month period of the decontamination phase, which is an average of approximately 8 trucks a day. All of these de-stocking, decontamination and cleaning operations will be carried out in areas that were designed for the unloading, storage and handling of the raw materials and wastes that they contained. Hence the potential for any environmental effects during these operations will be minimised.

Phase 2 activities will include:

- Electrical isolation of all power systems;
- Removal of power and signal cables;
- Recovery of any remaining internal plant and equipment;
- Main process building and equipment demolition;
- Ancillary building demolitions;
- Recovery and disposal of residual materials from the site.

The same mitigation measures as outlined for the construction phase designed to control noise, dust, traffic and surface water run-off will be implemented for the demolition phase to ensure that the impact on the local community is kept to a minimum during this phase.

Circa 50,000 tonnes of concrete, blockwork, paving, cladding and other building materials will be removed from site during the demolition phase. This represents 2,364 No. truckloads of material to be removed from the site over a five month period. At the peak of activity during this 5 month phase, approximately 29 trucks a day will be used to transport these materials off site.

Environmental monitoring will be undertaken for the entire duration of the decommissioning period to ensure that any potential environmental effects from the Phase 1 and Phase 2 decommissioning activities are minimised.

Both phases of decommissioning activities are expected to take six to nine months. Environmental monitoring, testing, validation and reporting will be undertaken for a further six to twelve months. Key Indaver staff will also be retained on site during this period including site security staff, until all of the decommissioning activities and environmental reporting have been completed.

There will be up to 30 staff and contractors' personnel on site during the six to nine months period but the average number on site will be less than this. The decommissioning activities will be undertaken within the hours of 08.00 to 18.00 from Monday to Friday.

The decommissioning activities will involve substantially fewer site activities, a substantially smaller workforce and consequently, substantially less truck and car traffic than the construction phase. Consequently, it is expected that the decommissioning will not have a significant impact on the environment or the nearest residential receptors.

The decommissioning activities are also outlined in **Section 4.18** of **Chapter 4** ***Description of the Proposed Development*** of this EIAR.

5.11 Construction Mitigation Measures

5.11.1 General

Every effort will be made to ensure that any detrimental environmental effects will be avoided, prevented or reduced during the construction phase of this project. Specific construction phase mitigation measures are described in the individual chapters and general mitigation measures are described below.

A construction environmental management plan (CEMP) has been prepared prior to construction commencing (Refer to **Appendix 5.1**). The CEMP will comprise all of the construction mitigation measures, which are set out in this EIAR, and any additional measures which are required by the conditions attached to the 2018 ABP decision and the future EPA decision. Implementation of the CEMP will ensure disruption and nuisance are kept to a minimum. The plan will have regard to the guidance contained in the handbook published by Construction Industry Research and Information Association (CIRIA) in the UK, *Environmental Good Practice on Site Guide, 4th Edition* (CIRIA 2015).

The CEMP summarises the overall environmental management strategy that will be adopted and implemented during the construction phase of the proposed development. The purpose of the CEMP is to demonstrate how the proposed construction works can be delivered in a logical, sensible and safe sequence with the incorporation of specific environmental control measures relevant to construction works of this nature. The CEMP sets out the mechanism by which environmental protection is to be achieved during the construction phase of the proposed development. Implementation of the CEMP will ensure disruption and nuisance are kept to a minimum.

The CEMP has been prepared in conjunction with the Environmental Impact Assessment (EIA) Report and Natura Impact Statement (NIS), having regard to consultations with a range of specialists and environmental organisations, in particular, the National Parks and Wildlife Service (NPWS). The CEMP supports the information already provided in this EIAR and must be read in conjunction with the information already provided in this EIAR.

5.11.2 Debris

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:

- Daily inspections will be undertaken to monitor tidiness.

- A regular program of site tidying 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.
- Wheel wash facilities will be provided for vehicles exiting the project site. Wheel wash run off will be stored in an onsite storage tank and will be disposed of by permitted waste haulage company at a permitted or licensed facility.
- In the unlikely event that mud is carried from the project site to the public road, it will be cleaned as required and will not be allowed to accumulate.
- Loaded lorries and skips will be covered if required.
- Surrounding roads used by trucks for access to and egress from the site will be inspected regularly and cleaned, using an approved mechanical road sweeper, when required.
- In the event of any fugitive solid waste escaping the site, it will be collected immediately and removed to storage on site, and subsequently disposed of in the normal manner.

5.11.3 Existing Services

The existing services running in and adjacent to the site and the road will be carefully located, identified and suitable working methods will be employed to ensure that these services are protected. Diversion or relocation of services will be undertaken in consultation with the owners of the services and will be undertaken in accordance with the relevant standards and codes of practice. Some protection measures such as cover slabs may be used for the services which will be left in place. Pipeline protection slabs will be used for works carried out in the vicinity of the gas transmission line, once it has been diverted. The section of the 450mm water main, which is located in the part of the road where the level is to be raised, will be replaced. This work will be undertaken in consultation with Cork County Council, which is acting as an agent for Irish Water.

Service users will be notified in advance of any temporary disruption or outages necessitated by the construction works. The disruption to services or outages will be carefully planned so the duration is minimised.

5.11.4 Invasive Non-native Plant Species Japanese Knotweed

Japanese knotweed is a highly invasive, non-native species which can out-compete native plant species and which can penetrate through small faults in tarmac and concrete and thus can damage roads, footpaths and structures.

At present, there are no specific legislative provisions that directly govern Japanese knotweed control or removal in Ireland.

Ecological surveys recorded a small stand of Japanese knotweed along the western boundary of the site and also outside the site's north-western boundary. Refer to **Figure 12.3** for details of where these stands are present at the site boundary and in the lands beyond the site boundary. This figure has been updated with the details of site visits and surveys completed since the 2016 EIS was prepared. The site layout of the proposed development has been designed not to directly impact on the stand of Japanese knotweed.

Since the completion of the EIS in 2016, Indaver have engaged a specialist company to actively monitor and treat these stands of Knotweed at the boundary to prevent any spread onto the Indaver site. Monitoring and treatment of the stands has been ongoing since 2017.

As part of the ongoing management of the infestation at the Indaver site boundary, the site was resurveyed in May of 2019 and treatment (spraying of plants where accessible from the Indaver site) will continue in the late summer/early autumn of 2019. The monitoring and treatment will continue up to the start of construction on site and thereafter until construction is complete as outlined in the CEMP in **Appendix 5.1** to this EIAR under **Section 8**.

There is also the potential for Japanese knotweed to be inadvertently brought onsite in imported fill or on the wheels/tracks of construction vehicles. The supplier of fill will be required to provide a guarantee that the fill to be imported does not contain Knotweed. In addition, the fill will be inspected for signs of knotweed, prior to importation to site. The inspection of topsoil brought into the site, will be carried out according to the Standard, BS3882:2015 *Specification for Topsoil.*

The contractor will be required to inspect vehicles before using them on site and will pay particular attention to caterpillar tracks and where trucks and dumpers are stowed.

The implementation of the above measures will minimise the risk of Knotweed being spread within the site or outside the site during the construction phase of the proposed development.

5.12 Construction Traffic

The impact of the generated traffic on the local road network during the construction of the proposed development is evaluated in **Chapter 7 *Roads and Traffic*** of this EIAR***,*** and mitigation measures are proposed where necessary.

The appointed contractor will be required to develop a Construction Stage Traffic Management Plan in advance of commencing the works on site. This is a requirement of the planning permission (specified in Condition 7, parts (d), (e) and (f)) granted by An Bord Pleanála (ref 04.PL0045). The contents of the plan are outlined in section 10.3 of the CEMP attached as **Appendix 5.1** to this EIAR. The plan will be implemented at the commencement of the works. The plan will need to implement all relevant mitigation measures identified in this EIAR, together with any additional requirements imposed by conditions attached by the 2018 An Bord Pleanála decision to grant permission and the EPA decision. For example, the Construction Stage Traffic Management Plan will confirm the indicative traffic routes to the site which have been identified in the application documentation.

Points of access and egress for the site will be confirmed and management measures identified in the application documentation will be agreed with Cork County Council.

In order to ensure compliance by contractors and suppliers, the requirements of the EIAR, and all additional requirements imposed by conditions attached by An Bord Pleanála will be included in all contract tender documents and will be discussed in detail prior to awarding a contract. All traffic movements associated with the import and export of materials have been included in the construction traffic impact assessment. Refer to **Chapter 7 *Roads and Traffic***, for further details.

The plan will be regularly reviewed and updated to take into account the changing patterns of both the existing traffic and the construction traffic, following consultation with Cork County Council. The routing of any exceptional loads will require liaison with Cork County Council and the Garda Siochána.

During the road upgrade works and the coastal protection works, the traffic management plan will ensure that disruption to local traffic will be minimised.

The implementation of this plan will be monitored by the Indaver Site Management team during the course of the project and will also be reviewed at the main site meetings.

5.13 Construction Health and Safety

The requirements of the Safety, Health and Welfare at Work Act 2005, the Safety, Health and Welfare at Work (Construction) Regulations, 2013 and other relevant Irish and EU safety legislation will be complied with at all times.

As required by the *Safety, Health and Welfare at Work (Construction) Regulations 2013*, a Health and Safety Plan will be prepared 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 comply with the requirements of the Regulations.

In accordance with the Regulations, a “Project Supervisor Design Process” (PSDP) was appointed for the initial design phase associated with the planning application. The file from this process will be passed to a newly-appointed PSDP once a preferred bidder has been selected to construct the facility. A “Project Supervisor Construction Stage” will also be appointed prior to the start of construction on site.

The Project Supervisor Construction Stage (PSCS) will assemble the Safety File as the project progresses. The safety file will be incorporated into the overall technical record system at the end of project.

Safety on site will be of paramount importance. During the selection of the contractors and subcontractors, their safety records will be investigated. Only contractors with high safety standards will be selected.

Prior to working on site, each individual will receive a full safety briefing and will be provided with all of the safety equipment relevant to the tasks the individual will be required to perform during employment on site.

Safety briefings will be held regularly and prior to any onerous or special task. 'Toolbox talks' will be held to ensure all workers are fully aware of the tasks to be undertaken and the parameters required to ensure the task will be successfully and safely completed.

All visitors will be required to wear appropriate personal protective equipment prior to going on to the site and will undergo a safety briefing by a member of the site safety team.

Regular site safety audits will be carried out throughout the construction programme to ensure that the rules and regulations established for the site are complied with at all times.

At any time that a potentially unsafe practice is observed, the PSCS, Construction Manager or a member of the Indaver contract management team will have the right as well as the responsibility to halt the work in question, until a safe system of working is again put in place.

There will be an Indaver contract management team (comprising Indaver staff) on site for the duration of the construction phase. The team will supervise the construction of the works including monitoring the contractor's and the PSCS's performance to ensure that the proposed construction phase mitigation measures are implemented, and that construction effects and nuisance are minimised.

Appropriate site personnel will be trained as first aiders and fire marshals. In addition, appropriate staff will be trained in environmental issues and spill response procedures. Tanks and drums of potentially polluting materials will be stored in secure containers or compounds which will be locked when not in use. Secure valves will be provided on oil and fuel storage facilities. Equipment and vehicles will be locked, have keys removed and be stored in secure compounds.

The contractor will maintain an incident and emergency response action plan which will cover all foreseeable risks, i.e. fire, flood, collapse etc. An Incident Response Plan (IRP) is located in **Section 9** of the CEMP in **Appendix 5.1**.

The objective of this IRP is to:

- Ensure the health and safety of workers and visitors along the site.
- Minimise any effects to the environment and ensure protection of the water quality and the aquatic species dependent on it.
- Minimise any effects on properties, services etc.
- Establish procedures that enable personnel to respond to incidents with an integrated multi-departmental effort and in a manner that minimises the possibility of loss and reduces the potential for affecting health, property, and the environment.

The primary function of the sites security team will be to ensure that no unauthorised entry to site occurs. There will be fencing around the sites to minimise the risk of vandalism and unauthorised access. This process will be made easier by all operatives possessing an ID card. ID Cards will only be issued to operatives that have attended the relevant site safety induction.

5.14 Residual Effects

It is anticipated that, with proper management, the construction phase of the development will not have significant long-term negative effects.

The residual construction effects of the construction phase are addressed in **Chapters 7 *Roads and Traffic,* 8 *Air Quality,* 9 *Climate,* 10 *Noise and Vibration,* 11 *Landscape and Visual,* 12 *Biodiversity,* 13 *Soils, Geology, Hydrogeology, Hydrology and Coastal Recession,* 15 *Material Assets,* 14 *Archaeological, Architectural and Cultural Heritage*** and **17 *Cumulative Effects, Other Effects and Interactions*** of this EIAR.

The residual effects will last for the duration of the construction phase only and will include:

- temporary closure of access the area of Gobby Beach where coastal protection works will take place and a section of the car park for the three week duration of the placing of material on the beach. However, access to the rest of the beach will be maintained for the duration of the works
- disruption to road users and use of the temporary road for the twelve week duration of the road upgrade works. During the twelve week period, the car park may be temporarily closed for up to six weeks however access to the beach will be maintained for the duration of the works,
- additional noise from the site for the duration of the construction phase,
- additional traffic on the road network for the duration of the construction phase, and
- very short-term disruption and outages to services as new connections are made and/or services are relocated.

The long-term residual effects will include:

- disposal of surplus excavated material from the site to a permitted site (where a re-use for the material cannot be found, refer to **Section 5.5**),
- consumption of fuel, natural resources and construction materials such as steel, concrete and imported fill.

5.15 References

British Standard BS 5228 – 1 (2009 +A1 2014) (*Code of practice for noise and vibration control on construction and open sites – Noise).*

British Standard BS3882 (2015) *Specification for Topsoil.*

Construction Industry Research and Information Association, (2015) *Environmental Good Practice on Site*, CIRIA, London.

Construction Industry Research and Information Association, (2001) *Control of Water Pollution from Construction Sites, guidance for consultants and contractors*, CIRIA, London.

Department of Transport (2010) – Traffic Signs Manual

Kelly, J., Maguire, C.M. and Cosgrove, P.J. (2008) *Best Practice Management Guidelines Japanese knotweed Fallopia japonica,* Prepared for NIEA and NPWS as part of Invasive Species Ireland.

Murnane E., Heap A., Swain A. (2006) *Control of Water Pollution from Linear Construction Projects CIRIA*, London.

National Construction and Demolition Waste Council (2006*), Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects,* NCDWC, Dublin.

National Roads Authority (2014) *Good Practice Guideline for the Treatment of Noise during the planning of National Road Schemes*, NRA, Dublin.

National Roads Authority (2008) *Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads, NRA,* Dublin.

Safety, Health and Welfare at Work (Construction) Regulations 2013

Indaver

Ringaskiddy Resource Recovery Centre

Construction Environmental Management Plan

CEMP

Issue | 27 May 2019

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 238129-00

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1 Introduction

1.1 Introduction

This Construction Environmental Management Plan (CEMP) summarises the overall environmental management strategy that will be adopted and implemented during the construction phase of the Ringaskiddy Resource Recovery Centre, hereafter referred to as the proposed development. The purpose of the CEMP is to demonstrate how the proposed construction works can be delivered in a logical, sensible and safe sequence with the incorporation of specific environmental control measures relevant to construction works of this nature. The CEMP sets out the mechanism by which environmental protection is to be achieved during the construction phase of the proposed development. Implementation of the CEMP will ensure disruption and nuisance are kept to a minimum.

The CEMP has been prepared in accordance with industry best practice guidance including:

- TII's Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan;
- Construction Industry Research and Information Association (CIRIA) in the UK, Environmental Good Practice on Site Guide, 4th Edition (CIRIA 2015).

The CEMP has been prepared in conjunction with the Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS), having regard to consultations with a range of specialists and environmental organisations. It is noted that this CEMP must be read in conjunction with the construction details already provided in the EIAR and NIS. Further details on the information included in the CEMP are presented below:

- General Project Details;
- Contact Sheets;
- Reference Documents;
- Organisational Structure/Duties and Responsibilities;
- Environmental Commitments and Environmental Control Measures;
- Site Specific Method Statements/Management Plans;
    - Construction Waste Management Plan;
    - Construction Stage Health & Safety Plan;
    - Incident Response Plan;
    - Construction Traffic Management Plan;
- Environmental Awareness Training Strategy;

- Communications Strategy;
- Inspections, Auditing and Monitoring Compliance Strategy;
- Final Handover.

The CEMP is a working document and will be finalised by the Contractor following appointment and prior to commencing works on site. As stated previously, this CEMP must be read in conjunction with the construction details already provided in the EIAR and NIS. All of the content provided in this CEMP will be implemented in full by the Contractor and the finalisation of the CEMP by the Contractor will not affect the robustness and adequacy of the information presented here and relied upon in the EIAR and NIS.

Some information (such as project details) has already been provided in the EIAR and NIS and is not repeated in this version of the CEMP. However, it will be included in the CEMP which is finalised by the Contractor.

In addition to the items listed above, the following information will also be provided by the Contractor when finalising the CEMP:

- Planning Consent - All relevant planning conditions will be included in the CEMP.
- Industrial Emissions Licence Consent - any relevant licensing conditions will be included in the CEMP.
- Comprehensively incorporate all Environmental Commitments set out in the Contract documents (with the Contractor), those presented in the EIAR and NIS and any additional commitments which may arise as part of the EIA process up to and including the EPA IE licence final decision. The CEMP will include the complete suite of Environmental Commitments together with the relative specification, evidence and responsibilities of how each commitment will be met. The environmental mitigation measures, referred to as the Environmental Commitments in this document, are included within **Chapter 18** of the EIAR.
- Relevant Environmental Performance Criteria prescribed in environmental legislation and in Contract documents.
- Register of all applicable legislation, including relevant standards, Codes of Practice and Guidelines.
- Description of the Environmental Management System of the proposed development, which shall be devised according to the criteria of ISO 14001:2004 – Environmental Management Systems. The CEMP will be complemented by General Procedures, Work Procedures and Operations Instructions. These documents will be in place within the site administration offices and appropriate site locations during works.

The CEMP is a dynamic document and the Contractor will ensure that it remains up to date for the duration of the construction period.

The CEMP may need to be altered during the lifecycle of the construction period to take account of monitoring results, legislative changes, outcomes of third-party consultations etc. Additional appendices may be added to the CEMP to accommodate monitoring results, permits etc. All of the content provided in this CEMP will be delivered in full by the Contractor and the finalisation of the CEMP by the Contractor will not affect the robustness and adequacy of the information presented here and relied upon in the EIAR and NIS. It should also be noted that there will be other project documentation required to meet other regulatory requirements e.g. Health & Safety and Quality. These other documents will serve to inform and complement the CEMP (such as the construction stage Health and Safety Plan and the Quality Plan) and within the overall project structure these documents are maintained on an equal footing.

In order to help ensure the successful development, implementation and maintenance of the CEMP, the Contractor will be obliged to appoint a Site Environmental Manager (SEM). The SEM will possess sufficient training, experience and knowledge appropriate to the nature of the task to be undertaken, a Level Eight qualification recognised by the Higher Education and Training Awards Council (HETAC), or a University equivalent, or other qualifications acceptable to Indaver, in Environmental Science or Environmental Management, or other subjects acceptable to Indaver. Further details on the roles and responsibilities of the SEM are provided throughout this document.

The Contractor will be required to submit the CEMP to Indaver after receiving notice of Commencement of Works from Indaver and at least two weeks prior to the start of works on site. In order to help fulfil his/her duties under the Contract, Indaver will carry out an audit of the CEMP at sufficient intervals to ensure that the main Contractor is complying with the environmental provisions of the Contract.

If a Project Extranet is being established, an electronic version of the CEMP will be placed on this site to allow members of staff of the Contractor, and Indaver monitor and view the CEMP.

1.2 Contract Procurement

A decision on the exact contractual arrangements for the construction of the proposed development has not yet been made. The Contractor for the works will be contractually bound within the contract by any conditions arising from the site constraints, the commitments and mitigation measures set out in the EIAR, NIS, Indaver's requirements for the proposed development, planning conditions and any modifications that may be imposed on the proposed development by the EPA and or other Statutory Regulations. Prior to the commencement of construction, the CEMP will be finalised by the Contractor, approved by Indaver and submitted to Cork County Council for agreement.

2 General Project Details

Information on the proposed development will be included in this section. This information will assist those without detailed knowledge of the proposed development in quickly familiarising themselves with the key elements of the proposed development and will also assist those who have a need to examine, review or audit the CEMP.

Details will include a description of the key elements of the proposed development, the location of construction compounds, construction phasing, duration and drawings of the proposed development. This information has already been provided in the EIAR and NIS and is not repeated in this version of the CEMP but it will be included in the CEMP which is finalised by the Contractor in conjunction with Indaver.

3 Contact Sheets

Contact sheets of relevant personnel are required primarily in order to ensure the efficient reporting of environmental incidents. It is important that these contact details are frequently reviewed to ensure that they are up to date. Contact details may be broken down into three categories: Contractor contacts, Indaver contacts and third party contacts. Contact details will include the organisation, position title, name, mobile phone number and email address of relevant personnel.

The contact sheets will be included in the CEMP finalised by the Contractor.

4 Reference Documents

This section is included in the CEMP to provide an overview of the reference documents used in its development. Reference documents are divided into two categories: Project Specific Reference documentation and General Reference and Guidance documentation.

Project Specific Reference documents have been written specifically with the proposed development in mind and will be referenced in determining the Environmental Commitments and Requirements which must be adhered to during construction. These documents include the EIAR and NIS. Other project specific reference documents will be included in this section when the Contractor finalises the CEMP. These will include reference to documents such as the Contract Documents, ABP's Order (containing all relevant planning conditions), any relevant EPA IE Licence conditions, the Schedule of Environmental Commitments, Health and Safety Plan (for construction stage Health and Safety), Quality Plan and any other relevant project specific reference documentation.

General Reference and Guidance documentation of relevance indicate best practice approaches to addressing significant environmental impacts during construction. Cognisance of these documents will be taken in finalising the methods documented in this CEMP by which construction will be managed to prevent, reduce or compensate for potential adverse significant impacts on the environment. The list provided below is non-exhaustive and will be finalised by the Contractor as some of the standards/documents may be revised in in the interim or additional new documents added at that stage.

The main guidelines used in preparing the CEMP are:

- Environmental Protection Agency (EPA) Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2017).
- Environmental Protection Agency (EPA) Draft Revised Guidelines on Information to be contained in Environmental Impact Statements (EPA, 2015).
- Environmental Protection Agency (EPA) Draft Advice Notes for Preparing Environmental Impact Statements (EPA, 2015).
- Environmental Protection Agency (EPA) Guidelines on the information to be contained in Environmental Impact Statements (EPA, 2002).
- Environmental Protection Agency (EPA) Advice Notes on current practice in the preparation of EISs (EPA 2003).

Waste Related

- Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (Department of Environment, Heritage and Local Government, July 2006).

Earthworks

- TII (2013) Notes for Guidance on the Specification for Road Works Series NG600 – Earthworks (including NG601 Classification, Definition and Uses of Earthworks Materials and Table 6/1: Acceptable Earthworks Materials: Classification and Compaction Requirements); and
- ICE (2015) Earthworks, A Guide (2nd Edition).

Silt and Pollution Control Related

- CIRIA (C793) The SUDS Manual;
- CIRIA (C624) Development and flood risk – guidance for the construction industry;
- CIRIA (C532) Control of water pollution from construction sites, guidance for consultants and contractors (2001);
- CIRIA (C741) Environmental good practice on site guide (fourth edition) (2015).

5 Organisational Structure/Duties and Responsibilities

Information on the Contractor organisational structure/duties and responsibilities will be provided by the Contractor in this section. The Contractor's organogram will illustrate the Contractor's reporting and hierarchal structure. The Contractor will update the CEMP to include this organogram and it will be referred to in devising the duties and responsibilities of Contractor site personnel under the CEMP. The inclusion of the organogram will also allow those auditing and reviewing the CEMP to quickly assess the extent and shape of the Contractor's project organisation and the duties and responsibilities of the various personnel.

The Contractor will update the CEMP to include the duties and responsibilities of the Contractor's personnel. The assignment and communication of duties and responsibilities to individual named members will help ensure the successful implementation of the CEMP. The Project Team, including the Project Manager, Construction Manager, Indaver contract management team and Site Environmental Manager (SEM) will liaise during the finalisation of the CEMP to assign individual duties and responsibilities bearing in mind the overall organisational structure, the nature of the Environmental Commitments and Requirements and the proposed development specific characteristics.

The role of SEM is vital in ensuring that the CEMP is finalised, implemented and maintained. The Contractor will appoint the SEM. As detailed previously in **Section 1**, the SEM will possess sufficient training, experience, qualifications and knowledge appropriate to the nature of the task to be undertaken. The SEM will be responsible for co-ordinating the day to day management of environmental impacts during the construction phase and for assisting and advising the Contractor's Project Team when programming construction activities and devising methodologies, taking cognisance of EIA/AA requirements. The SEM will ensure that works are constructed in accordance with the relevant Environmental Commitments and Requirements and that such compliance is adequately recorded and documented.

The SEM will be support the Indaver contract management team in third-party consultations and in public and internal communications on environmental issues. The SEM will also be responsible for performing site inspections/audits and maintaining records for inspection. In addition, the SEM will deal with licensing and permit issues, keep up to date with relevant environmental best practice and legislative changes, engage in staff training, manage responses to environmental incidents and engage environmental Contractors as and when required.

The SEM will procure the advice and services of specialised qualified and accredited environmental professionals as and when required in order to help fulfil the SEM's duties and responsibilities under the CEMP.

6 Environmental Commitments

The CEMP is a working document and will be finalised by the Contractor following appointment and prior to commencing works on site. As stated previously, this CEMP must be read in conjunction with the construction details already provided in the EIAR and NIS. Some information has already been provided in the EIAR and NIS and is not repeated in this version of the CEMP. However, it will be included in the CEMP which is finalised by the Contractor. The Environmental Commitments are included within **Chapter 18** ***Summary of Effects, Mitigation and Monitoring Measures*** of the EIAR.

The Contractor will update this section to include the comprehensive suite of Environmental Commitments. As discussed previously, these Environmental Commitments may emanate from, inter alia:

- The Contract documents;
- Environmental Commitments presented in **Chapter 18** of the EIAR including those required for the NIS;
- Any additional commitments which arising from the EPA licensing process and including any final licence conditions related to the construction phase;
- The planning conditions imposed by An Bord Pleanála (ABP) in their consent for the proposed development; and
- Any plans, procedures or commitments submitted and agreed with Cork County Council as required by the ABP conditions.

The Site Environmental Manager (SEM) will create a summary table in which each Environmental Commitment is noted. In order to understand the rationale for such commitment, the relevant document, legislation etc. will be referenced. Once the Environmental Commitments have been entered, the SEM will input the method by which it is proposed to ensure that the Environmental Commitment is met (e.g. a reference to the relevant site-specific method statement or environmental control measure)

As noted previously, the CEMP is a working document and Environmental Commitments may alter, whilst still achieving the same level of environmental protection, over the course of construction. Therefore, the SEM will update the Environmental Commitments listing as appropriate.

In addition, the methods by which it is proposed to ensure that the Environmental Commitments are met may alter during the course of construction for example due to a result of changes in relevant environmental legislation. Therefore, the SEM will update the method statements as appropriate.

The updated method statements will deliver the Environmental Commitments and will not affect the robustness and adequacy of the information presented here and relied upon in the EIAR and NIS.

The Environmental Commitments table will be regularly updated during construction to indicate a reference to the documentary proof that each Environmental Commitment has been met. This may be in the form of a signed off site-specific Method Statement, consultation certificate, results of monitoring, etc., as appropriate. The documentary proof will be attached to the CEMP.

Environmental control measures are discrete actions or procedures that will assist in meeting the Environmental Commitments. They are typically set out in discrete sheets according to environmental impact type (e.g. impacts on Bats, Badgers etc). The Environmental Control Measure Sheets will include the specific information already documented in the EIAR or NIS and will also list any requirements such as pre-construction site walkover, compliance with relevant licenses, approvals and legislation. It will also list the responsibilities of the individual Contractor personnel and will indicate the relevant reference documentation. It will be the responsibility of the SEM to ensure that all Environmental Control Measure Sheets are sufficient to meet the Environmental Commitments. The SEM will be responsible for bringing the Environmental Control Measure Sheets to the attention of the Contractor and the Indaver construction management team on site. The Construction Manager will be responsible for bringing the relevant Environmental Control Measure Sheet to the attention of all site personnel for review and sign-off. The SEM will formalise the Environmental Control Measure Sheets and will provide to the Contractor for inclusion in the CEMP.

For some Environmental Commitments such as construction waste management & construction traffic management, it is necessary to incorporate them into a site-specific plan. The following plans are detailed in this CEMP:

- Construction Waste Management Plan;
- Non-native Invasive Species Management Plan;
- Incident Response Plan;
- Construction Traffic Management Plan.

7 Construction Waste Management

7.1 Introduction

Construction waste management plan (CWMP) has been set out to ensure that waste arising during the construction of the proposed development on site will be minimised and, managed and disposed of in a way that ensures compliance with the provisions of the Waste Management Acts, 1996- 2011 and associated Regulations (1996-2011) to ensure that optimum levels of reduction, re-use and recycling are achieved.

The plan provided below is consistent with mitigation measures as contained within the EIAR and NIS and the current schedule of environmental commitments. This CWMP is a working document and will be finalised by the Contractor following appointment and prior to commencing works on site. All of the content provided in this Plan will be delivered in full by the Contractor and its finalisation by the Contractor will not affect the robustness and adequacy of the information presented here and relied upon in the EIAR and NIS.

The CWMP has been prepared in accordance with the following documents:

- Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (Department of Environment, Heritage and Local Government, July 2006).

The *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects* note that Project CWMP should be prepared for Civil Engineering projects producing in excess of 500m^3 of waste, excluding site materials used for development works on the site. At planning stage, it is estimated that the proposed development project will produce in excess of 500m^3 therefore to comply with the guidelines a CWMP has been prepared.

This document is based on a high-level estimate of waste generation and management from the proposed development at planning stage.

The principal objective of sustainable resource and waste management is to use material resources more efficiently, to re-use, recycle and recover material and reduce the amount of waste requiring final disposal. To achieve resource efficiency there is a need to move from a traditional linear economy to a circular economy (see **Figure 1**).

However, where residual waste is generated, it should be dealt with in a way that follows the waste hierarchy (see **Figure 2**) and actively contributes to the economic, social and environmental goals of sustainable development.

Figure 1: Circular Economy



Figure 2: Waste Hierarchy | Source EPA



The Contractor will finalise the CWMP for the proposed development following appointment which will meet the requirements of the *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects* (Department of Environment, Heritage & Local Government. 2006) and implement this C&D WMP.

7.2 Sources of Construction & Demolition Waste

The construction works of the proposed development does not include the demolition of any structures.

7.2.1 Construction Phasing

Surplus materials generated during the following phases are addressed in this report:

- The excavation phase.
- The construction phase.

Likely surplus materials which will be generated during each of these phases are described in the sections below.

In line with the principles of sustainable development, the proposed development will seek to minimise the amount of materials brought into the construction site.

The Contractor will endeavour to re-use as much of the surplus materials and wastes generated during demolition, excavation and construction as feasible within the proposed development boundary subject to further testing to determine if materials meet the specific engineering standards for their proposed end-use.

7.2.2 Excavation Waste Generation

Details are outlined in **Section 15.5.2.9** of the EIAR.

7.2.3 Construction Waste Generation

Construction and demolition waste is defined as waste which arises from construction, renovation and demolition activities, together with all waste categories mentioned in **Chapter 17** of the EPA List of Wastes (LOW) (See **Appendix A**).

Also included within the definition are surplus and damaged products and materials arising in the course of construction work or used temporarily during the course of on-site activities.

Construction waste can vary significantly from site to site but typically would include the following non-hazardous fractions:

- Soil and stone;
- Concrete, brick, tiles and ceramics;
- Asphalt;
- Metals;
- Wood;
- Other.

The hazardous waste streams which could arise from construction activities may include the following:

- Batteries;
- Liquid fuels.

The construction phase of the proposed development is expected to commence in 2020. In the case of the proposed development the most likely type of waste materials will be soil and stone.

An indicative breakdown of the composition of typical construction and demolition waste is set out in **Table 2** below. These figures should be considered as a guide only as construction and demolition waste can vary significantly from one project to another, depending on the nature of the development and the waste management practices employed on-site.

Table 2: Composition of Construction and Demolition Waste (Non-Hazardous) F[1]

Category	Composition
Soil and Stone	45%
Concrete, brick, tiles and ceramics	31%
Asphalt / Tar	1%
Metals	6%
Wood	7%

7.3 Proposals for Construction and Demolition Waste Management

7.3.1 Circular Economy and the Waste Hierarchy

The waste hierarchy sets out the most desirable approaches to waste management in the European Union. It became obligatory in Ireland in 2011 through the European Communities (Waste Directive) Regulations 2011. The waste hierarchy i.e. prevention, re-use, recycling, energy recovery and disposal applies in priority order with waste prevention being the most preferable option and waste disposal the least desirable.

7.3.2 General Construction Waste Management

The following general measures will be implemented throughout the proposed development:

- The Contractor will ensure that waste generation on site is minimised.
- Possibilities for re-use of clean non-hazardous excavation material as fill on the site and landscaping works will be considered following appropriate testing to ensure material is suitable for its proposed end use.

[1] FAS & Construction Industry Federation. 2002. Construction & Demolition Waste Management – A handbook for Contractors & Site Managers. FAS Environmental Unit, Upper Baggot Street, Dublin 4.

- Where excavation material may not be re-used within the proposed works the Contractor will endeavour to send material for recovery or recycling so far as is reasonably practicable and ensure that disposal is minimised.
- Where re-use of surplus material within the proposed development is not feasible the Contractor will ensure that waste generated will be delivered to authorised waste facilities in accordance with the Waste Management Acts 1996 -2011.
- The Contractor will ensure that any interim storage facilities for excavated material have the appropriate waste licences or waste facility permits in place.
- Waste and surplus excavation material from the proposed development will be delivered only to facilities which have a granted waste licence or waste permit in place.
- **Source Segregation:** Waste produced will be segregated. Where possible metal, timber, glass and other recyclable material will be segregated during demolition works and removed off site to a permitted/licensed facility for recycling.
- **Material Management:** The Contractor will ensure that materials are ordered so that the quantity delivered, the timing of the delivery and the storage is not conducive to the creating of unnecessary waste. 'Just-in-time' delivery will be used so far as is reasonably practicable to minimise material wastage.
- **Waste Auditing:** The Contractor will record the quantity in tonnes and types of waste and materials leaving the proposed development during the construction phase. The name, address and authorisation details of all facilities and locations to which waste and materials from the proposed development are delivered will be recorded along with the quantity of waste in tonnes delivered to each facility. Records will show material which is recovered, and which is disposed.
- Hazardous wastes will be identified, removed (see **Section 7.3.7.2** below) and kept separate from other C&D waste materials in order to avoid further contamination.

7.3.3 Waste Prevention

- The most environmentally sustainable means of managing excavated material is its prevention and minimisation. Prevention and minimisation is inherent in the design of the proposed development.
- Where possible excavated materials generated from the earthworks will be re-used on site where it meets engineering requirements. Approximately 49,738m^3 of excavated material will be re-used on site.

7.3.4 Recycling and Energy Recovery

Excavated material generated during the works will be reused within the project area where feasible. Off-site re-use options for surplus clean and inert excavated material include reuse as a by-product on other sites subject to Article 27 notification to the EPA, or recovery at suitable waste permit facilities or licensed soil recovery facilities in accordance with relevant waste legislation.

Recycling/ recovery activities also include:

- Processing of stone to produce construction aggregate;
- Infilling of quarries;
- Raising land for site improvement or development.

In addition to licensed and permitted waste facilities, some IE licenced facilities have a requirement to import soil and stones in accordance with the terms of their Closure, Restoration and Aftercare Management Plans (CRAMP). Such sites may potentially accept suitable surplus material from the proposed development.

7.3.5 Disposal

The option of delivery of inert uncontaminated material for disposal to landfill is the least desirable destination for surplus material generated by the proposed development. It will only be considered where a re-use for the material cannot be found and sufficient void capacity cannot be secured at appropriately licensed/permitted facilities for recovery purposes.

It may be unavoidable that a small percentage of excavation material will have to be disposed of at a landfill or at another type of suitably permitted facility. This disposal option applies to material having hazardous chemical or physical properties requiring special measures for its excavation, handling, storing, transportation, deposition and disposal. All material presented for disposal will have to meet the receiving sites waste acceptance criteria.

7.3.6 Construction Compounds and Material Storage

On completion of the ground preparation works, it is proposed that the Construction Compound will be located within the western field for the main construction phase.

On completion of the construction phase, temporary buildings and containers, and waste material such as rubble, aggregates and unused construction materials will not be permitted to remain on these sites and will be removed and disposed of appropriately.

Some contractor accommodation will remain and associated car-parking facilities in the main construction compound will also remain to facilitate a small number of staff from the Contractor who will still come to the site periodically during the 2-year guarantee period after the end of the commissioning phase.

7.3.7 Waste Transportation

7.3.7.1 General

Waste from the proposed development will be transported by authorised waste collectors in accordance with the Waste Management (Collection Permit) Regulations, 2007 and the Waste Management (Collection Permit) (Amendment) Regulations, 2008.

7.3.7.2 Hazardous Wastes

The following steps must be taken where hazardous waste is being transported from the proposed development to a hazardous waste recovery or disposal facility within the State:

- Waste transfer forms shall be obtained by the waste producer from Dublin City Council's web site and completed on-line before the waste is collected.
- A copy shall be downloaded, printed and signed, accompanying the consignment of hazardous waste when it is in transit.
- On the load's arrival, the operator of the recipient disposal or recovery facility shall log-in and complete the relevant details documenting the receipt of the waste.

Export of hazardous waste from the proposed development outside of the State is subject to a Europe-wide control system founded on EU Regulation 1013/2006 on the Shipments of Waste (known as the Transfrontier Shipment Regulations), as amended. This legislation is supplemented by the Waste Management (Shipments of Waste) Regulations 2007, as amended, which makes Dublin City Council responsible for the enforcement of this regulatory system throughout Ireland. Export of hazardous waste from site outside the state should comply with the procedures set out in this legislation.

7.4 Roles and Responsibilities

7.4.1 Construction Waste Co-Ordinator

At the time of preparation of this report (May 2019) the proposed development is at the IE licence pre-application phase. Following Contractor appointment, the Contractor will appoint a Construction Waste Co-Ordinator. This function may be combined with that of the SEM and will be at the discretion of the Contractor.

The Construction Waste Co-Ordinator will be responsible for detailing and maintaining the C&D Waste Management Plan for the project and updating it as appropriate.

Following each update or revision of the CWMP a copy of the new plan will be provided by the Construction Waste Co-Ordinator to Indaver, the SEM, the site subcontractors and all relevant staff.

The Construction Waste Co-Ordinator will have responsibility for implementation of the CWMP throughout the demolition, excavation and construction phases of the proposed development.

The Contractor will ensure the Construction Waste Co-Ordinator will be appropriately trained and experienced on all aspects of waste management.

In addition, the Construction Waste Co-Ordinator and all site staff handling wastes must be in a position to:

- Distinguish reusable materials from material suitable for recycling;
- Ensure maximum segregation of waste and recyclables at source;
- Co-operate with site manager on best locations for stockpiling reusable material;
- Separate material for recovery;
- Identify and liaise with operators of recovery outlets as appropriate.

In the event of the Construction Waste Co-Ordinator leaving the project team the Contractor will nominate a suitable replacement.

7.4.2 Training

The Construction Waste Co-Ordinator will have responsibility for ensuring copies of the CWMP are made available to all personnel on site. The Construction Waste Co-Ordinator will also have responsibility for ensuring that all site personnel and sub-contractors are instructed about the objectives of the CWMP and informed of the responsibilities which fall upon them as a consequence of its provision. This may be carried out during the induction process for new staff members.

The Construction Waste Co-Ordinator will also have responsibility for communicating the requirements of the plan using for example, toolbox talks, prominently displayed site notices and audits as relevant.

7.4.3 Record Keeping and Auditing Procedures

The Construction Waste Co-Ordinator shall arrange for full details of all arisings, movements and treatment of construction and demolition waste to be recorded during the excavation, demolition and construction phases of the proposed development.

When establishing the system for managing the details of all arisings, movement and treatment of construction waste in the CWMP, the use of electronic tools should be considered to provide for convenient recording of information in a useful format.

The Contractor will be required to arrange for full details of all arisings, movements and construction and demolition waste to be recorded during all stages of the proposed development.

Each consignment of construction waste removed from the site will be documented to ensure full traceability of the material to its final destination. Separate records will be completed in respect to each waste transfer that takes place.

The Contractor will also receive documents/records from waste collection companies employed during quantifying the exact amount of waste material removed from site. The documents/records from the waste collection companies will also identify how much material went to landfill and how much went for recycling.

All producers of hazardous waste are required by law to keep a chronological record of the quantity, nature and origin of any hazardous waste produced, as well as its destination, frequency of collection, mode of transport and treatment method. This obligation is a requirement of the European Communities (Waste Directive) Regulations 2011, which also mandate that this information be held for at least three years.

All the above records will be retained in a designated location and made available for auditing of the CWMP.

7.4.4 Waste Auditing Protocols

The Construction Waste Co-Ordinator will arrange for a waste audit of the proposed development once construction has fully commenced construction on site and of any facilities to which waste from the proposed development is delivered if required.

Indaver will receive summaries of any audit reports which will be completed within three months of the end of each calendar year. The effectiveness and accuracy of the documentation will be monitored on a regular basis via routine site visits.

8 Non-native Invasive Species Management Plan

Due to the presence of some stands of Japanese Knotweed at the Western boundary of the proposed site (on adjoining lands not owned by Indaver), monitoring has been in place since 2017 on this part of the site. The detail of this are outlined **Section 5.11.4** of the EIAR.

In short, the plan comprises regular monitoring and treatment of the Knotweed stands and ensuring that there is no spread onto the Indaver site. This process will continue up to and throughout the construction phase.

As there are no construction activities proposed that will disturb any of the existing stands, there is no requirement for a more detailed plan. However, the situation will continue to be monitored and as a minimum, a map of the affected boundary areas will be provided in this section of the CEMP.

9 Incident Response Plan

9.1 Introduction

The focus of including all of the detailed environmental measures in this CEMP is on prevention of the incident arising in the first place. However, an Incident Response Plan (IRP) has been prepared to ensure that in the unlikely event of an incident, response efforts are prompt, efficient, and suitable for particular circumstances. The IRP presented below is consistent with mitigation measures as contained within the EIAR and NIS. This plan is a working document and will be finalised by the Contractor, in conjunction with the Indaver contract management team on site, following appointment and prior to commencing works on site. All of the content provided in this Plan will be delivered in full by the Contractor and its finalisation by the Contractor will not affect the robustness and adequacy of the information presented here and relied upon in the CEMP.

The Incident (Emergency) Response Plan (IRP) describes the procedures, lines of authority and processes that will be followed to ensure that incident response efforts are prompt, efficient, and suitable for particular circumstances. The IRP details the procedures to be undertaken in the event of the release of any sediment into a watercourse, serious spillage of chemical, fuel or other hazardous wastes (e.g. concrete), non-compliance incident with any permit or licence, or other such risks that could lead to a pollution incident, including flood risks. The same process will be followed for any significant safety-related incidents.

The objective of this IRP will be to:

- Ensure the health and safety of workers and visitors along the site
- Minimise any impacts to the environment and ensure protection of the water quality and the aquatic species dependent on it
- Minimise any impacts on properties, services etc.
- Establish procedures that enable personnel to respond to incidents with an integrated multi-departmental effort and in a manner that minimises the possibility of loss and reduces the potential for affecting health, property, and the environment.

The information provided in this section is based on best practice including the following documentation:

- CIRIA (C649) Control of water pollution from linear construction projects, site guide (2006).
- CIRIA (C532) Control of water pollution from construction sites, guidance for consultants and contractors (2001).
- CIRIA (C741) Environmental good practice on site guide (fourth edition) (2015).

As required by the *Safety, Health and Welfare at Work (Construction) Regulations 2013*, a Health and Safety Plan will be prepared 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 comply with the requirements of the Regulations.

9.2 Implementation

The likelihood of an incident or emergency can be minimised by effective planning, good site management via implementation of this CEMP and the construction stage Health and Safety Plan (as outlined in **Section 5.13** of this EIAR), and through development of an IRP. The IRP will be reviewed and updated regularly so that it continues to apply to construction activities. The IRP will identify the on-site risks and appropriate responses.

It will be the responsibility of the SEM to maintain and change the IRP as required. The IRP will be reviewed on an on-going basis and immediately amended, as necessary, when applicable regulations are revised or when amendments are required by a regulatory authority.

The IRP in terms of health and safety will also require updating and submissions from the various contractors and suppliers as the proposed development progresses. The main source for these updates will come from the Health and Safety Plan which will be controlled and managed by the Contractor for construction safety on the site. The established communication between the Contractor, Construction Manager and the SEM will ensure that this is done when necessary. As previously stated, the same IRP will be followed for an environmental or a safety incident.

Cork County Council2 and Cork City Council3 each have a Major Emergency Plans respectively and prepared in accordance with the Government's Major Emergency Management Framework. The IRP details the initial contact that should be made in case of an emergency incident as well as those responsible for following up once an emergency event is declared.

The emergency services (particularly fire service) will be consulted to establish safe and appropriate access points to site compounds and other areas where there may be a risk of spillage etc. (e.g. outfalls, fuel storage). In an emergency, knowing the relevant people to contact for help can save time and minimise the impacts. To cover the full site, more than one contact may be needed, so the IRP will indicate which contacts apply to which section of the site.

Numbers will be obtained for the following:

- Radio/mobile contacts for site management and trained staff;

[2] Cork County Council (2018) Major Emergency Plan, Version 5.0. Available at: https://www.corkcoco.ie/major-emergency-management
[3] Cork City Council (2017) Major Emergency Response, Issue 1.6. Available at: https://www.corkcity.ie/en/media-folder/emergency/major-emergency-plan-2017.pdf

- Out-of-hours contacts;
- Environmental regulators (hotline or local contact);
- Irish Water (for spills to foul sewer);
- Cork County and City Councils (respectively);
- Inland Fisheries Ireland and National Parks and Wildlife Service;
- Environmental Protection Agency;
- Neighbouring sites such as NMCI, IMERC, Naval Base & Port of Cork;
- Spill response and clean-up contractors.

9.3 Resources

Relevant staff, including cover staff, shall be trained in the implementation of the IRP and the use of any spill kit/control equipment as necessary. The Contractor shall provide a list of all such staff to the Indaver contract management team detailing the name, contact number, and training received, and the date of that training.

The Contractor shall provide a full list, including the exact locations, of all pollution control plant and equipment to the Indaver contract management team. All such plant and equipment shall be maintained in place and in working order for the duration of the works.

9.4 Environmental Emergency Response Procedures

The best way to manage pollution incidents is to prevent them. Emergency procedures will be developed – either project specific, site specific or activity specific and all personnel on site will be required to know these procedures.

An effective pollution IRP relies on the following elements:

- Identification of all possible emergency scenarios (both environmental and health & safety);
- Effective planning, e.g. availability of booms, spills kits at appropriate locations;
- Identification of receptors/pathways (e.g. surface water drains/river);
- Identification and dissemination of contact numbers;
- Definition of site-based staff responsibilities;
- Appropriate site-based staff training;
- Exercise of incident scenarios – spill drills;
- Availability of suitable spill kits at appropriate locations on the site;
- Implement lessons learnt from previous incidents;

- Ensure that all appropriate site staff are aware of the site emergency procedure(s) (e.g. spillage, leakage, fire, explosion and flooding), that drain covers and spill kits are available, and they know how to use them.

In terms of pollution spill response procedures, these will vary depending on the sensitive receptor and nature of construction activities, but the following information will be included as a minimum and displayed at appropriate locations on the whole site, near outfalls etc.:

- Instruction to stop work and to switch off sources of ignition;
- Contain the spill; location of spill clean-up material;
- Name and contact details of responsible staff (these staff should assess the scale of the incident to determine whether the environmental regulator needs to be called);
- Measures particular to that location or activity (for example, close pond outlet valve).

More detailed plans may be project-specific, location-specific or specific to a particular activity depending on the nature of the work. They will include details of site drainage, outfalls, coastline and watercourses (as already provided in the EIAR and NIS) to indicate where pollution may end up so that containment measures can be put in place at these locations. Suitable equipment, such as spill kits, oil booms and absorbent material, will be held at appropriate locations on site.

Emergency equipment will be obtained from a reputable supplier and site staff will be trained in its correct use. Material Safety Data Sheets and best practice assessments will be used for advice on appropriate spill measures. The type of equipment required will depend on the activity taking place. The CIRIA document C648 *Control of water pollution from linear construction projects, technical guidance* (2006) provides details on the types and applications of emergency equipment. Refer to **Table 15.2** of same document.

Every effort will be made to prevent an environmental incident during the construction and operational phase of the proposed development. The focus of including all of the measures in this CEMP is on prevention of the incident arising in the first place. Oil/Fuel spillages are one of the main environmental risks that will exist on the proposed site which will require an emergency response procedure. The importance of a swift and effective response in the event of such an incident occurring cannot be over emphasised. An example of the steps to follow in the event of a spillage to ensure that the environmental risk is reduced to as low as reasonably practical. This procedure can be tailored to be site/location/activity specific as required:

- Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers;

- If applicable, eliminate any sources of ignition in the immediate vicinity of the incident;
- Contain the spill using the spill control materials, track mats or other material as required. Do not spread or flush away the spill;
- If possible, cover or bund off any vulnerable areas where appropriate such as drains, watercourses or sensitive habitats;
- Clean up as much as possible using the spill control materials;
- Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited;
- Notify the Site Environmental Manager (SEM) immediately giving information on the location, type and extent of the spill so that they can take appropriate action;
- The SEM will inspect the site and ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring;
- The SEM will notify the appropriate regulatory body such as Cork County Council, NPWS, EPA, Department of Communications, Climate Action and Environment (DCCE) and Department of Housing, Planning, and Local Government (DHPLG), if deemed necessary.

Environmental incidents are not limited to just fuel spillages. Therefore, any environmental incident will be investigated in accordance with the following steps.

- The SEM must be immediately notified;
- If necessary, the SEM will inform a member of the Indaver construction management team who will in turn contact the appropriate regulatory authority. The appropriate regulatory authority will depend on the nature of the incident;
- The details of the incident will be recorded on an Environmental Incident Form which will provide information such as the cause, extent, actions and remedial measures used, following the incident. The form will also include any recommendations made to avoid reoccurrence of the incident;
- In the very unlikely event of an incident occurring which may impact on a sensitive receptor, the relevant persons/authorities will immediately be informed (such as the EPA, Cork County Council, NPWS, etc.);
- A record of all environmental incidents will be kept on file by the Site Environmental Manager and the Contractor. These records will be made available to the relevant authorities such as Cork County Council and the EPA if required;

- The SEM will be responsible for any corrective actions required as a result of the incident e.g. an investigative report, formulation of alternative construction methods or environmental sampling, and will advise the Contractor as appropriate;
- By carrying out the above steps, a proper system will be in place to investigate, record and report any potential accidents or incidents.

9.5 Fire Control Measures

Every effort will be made to prevent the outbreak of a fire during the construction phase of the proposed development. Fire extinguishers and first aid supplies will be available in the work area. In the event of such an incident, the health and safety of all personnel will be a priority. All relevant legislation and guidance on health and safety of people and in particular fire safety will be complied with.

9.6 Emergency Procedures During Construction for Traffic Management

The Contractor shall ensure that unobstructed access is provided to all emergency vehicles along all routes and site accesses.

The Contractor shall provide to the local authorities and emergency services, contact details of the contractor's personnel who are responsible for construction traffic management.

In the case of an emergency the IRP shall be followed:

- Emergency Services will be contacted immediately by dialling 112;
- Exact details of the emergency / incident will be given by the caller to the emergency line operator to allow them to assess the situation and respond in an adequate manner;
- The emergency will then be reported to the Site Team Supervisors and the Safety Officer;
- All construction traffic shall be notified of the incident (where such occurs off site);
- Where required, appointed site first aiders will attend the emergency immediately;
- The Safety Officer will ensure that the emergency services are directed to and arrive at the emergency site.

9.7 Training and Testing

Staff responsible for action in an emergency need to know their responsibilities. An incident at one part of the site may affect other parts of the site, so it is important that someone be responsible for informing them. Staff will be trained to use the necessary equipment such as spill kits or outlet valves.

Emergency arrangements will need to be reviewed and tested periodically (and always after an incident) to ensure that measures are effective, and that the workforce is aware of what to do in the event of an incident. Emergency drills will be recorded, and improvements noted and actioned accordingly.

9.8 Corrective Action

When an incident happens, it is important to learn from it and ensure that such an incident does not occur again. This may involve changing the method of work for a particular activity, providing containment or treatment materials, or simply training staff so they are aware of the correct method of work. Similarly, if an audit of planned arrangements indicates that measures are not in place, or those in place need to be improved, action will be taken immediately.

A record of corrective actions and lessons learned will be kept and communicated to all relevant persons, teams, sub-contractors etc. across the proposed development.

10 Construction Traffic Management Plan

10.1 Introduction

The Construction Traffic Management (CTMP) will be finalised by the Contractor to ensure that construction traffic will be managed and monitored safely and efficiently throughout the construction phase.

10.1.1 Purpose and Scope

This Construction Traffic Management Plan is a key construction contract document, the implementation of which will reduce possible impacts which may occur during the construction of the proposed development.

The objectives of the CTMP are to:

- Outline minimum road safety measures to be undertaken at site access / egress locations, during the works and including approaches to such access/egress locations.
- Demonstrate to the developer, contractor and supplier the need to adhere to the relevant guidance documentation for such works.
- Ensure compliance with the mitigation measures outlined in the EIAR with respect to traffic management during the construction phase and with the planning conditions relating to construction traffic management from ABP.
- Provide the basis for the preparation of a finalised CTMP by the Contractor appointed to carry out the works.

Indaver shall be responsible for ensuring that the Contractor manages the construction activities in accordance with this CTMP. The Contractor will finalise the CTMP in accordance with this document.

Objectives and measures are also included for the management, design and construction of the project to control the traffic impacts of construction insofar as it may affect the environment, local residents and the public in the vicinity of the construction works.

In line with the conditions of the An Bord Pleanála (ABP) decision and, the CTMP which is finalised by the Contractor will address these requirements, including any additional measures which are specified by Cork County Council. The CTMP will require approval from the Cork County Council.

The objective of the CTMP is to ensure that the residual impacts to the public road network during the construction phase of the proposed development which have been identified in the application documentation are minimised and that transport related activities are carried out as safely as possible and with the minimum disruption to other road users.

The CTMP has also been prepared for the purpose of identifying appropriate and safe methods of access for construction traffic to the proposed development.

The CTMP describes the traffic management for the transportation of construction materials, equipment and personnel along the public road network to facilitate the construction of the proposed development. Light vehicles, such as cars and vans, will be used by site operatives travelling to and from the site. Heavy Construction Vehicles (HCV) will be required to deliver general construction materials, such as concrete, to the site.

The CTMP remains a live document that will be reviewed by the Contractor and expanded upon, where necessary, throughout the construction phase of the project, in order to produce a finalised CTMP. This CTMP should be read in conjunction with **Chapter 5 *Construction Activities*** and **Chapter 7 *Roads and Traffic*** of the EIAR.

10.1.2 Implementation

Key to the implementation of the CTMP is the dedication of the on-site Construction Manager (nominated by the Contractor) who will regularly liaise with and update the Indaver contract management team on all environmental and construction programming issues relating to the site. All site personnel are charged with following good practice and encouraged to provide feedback and suggestions for improvements. All site personnel are also required to ensure compliance with the requirements of the site's CTMP.

10.1.3 Document Revision

The CTMP includes a summary of all the information which will be included by the appointed Contractor In particular, it will include reference to conditions 7 and 15 of the ABP decision for the proposed development.

The CTMP will be subject to on-going review (throughout the construction phase of the proposed development), through regular auditing and site inspections. This will ensure that the performance of construction activities, including the implementation of mitigation measures, is subject to continuous improvement and ensure that objectives are met.

- All of the information required for the finalised CTMP will be highlighted in the tender for the contract to build the proposed development.

10.2 Proposed Construction Traffic Generation

10.2.1 Traffic Generation from Proposed development

Construction traffic has been quantified and assessed in **Chapter 7 *Roads and Traffic*** of the EIAR.

10.2.2 Envisaged Construction Equipment

Construction equipment and vehicles required for each construction element/operation will be delivered to site by appropriate vehicles. Details of typical construction equipment and vehicles are detailed in **Table 5** below. Specific equipment and vehicles which are deemed to be required for the proposed development by the principal contactor, suppliers and staff are to be confirmed and outlined in the Contractors finalised CTMP.

Table 5: Proposed Typical Construction Vehicles

Category / Stage	Advance Works / Site Preparation / Main Works / Reinstatement
Construction Vehicle	• Tractor & Low Loader (For Delivery of Excavator and Dumper) • Excavator • Dumper Truck (38 Tonne) • Bull Dozer • Wheeled Dumper / Tracked Dumper • 360º Tracked Excavator (13 tonne – 75 tonne) • Rock breakers • All Terrain Mobile Crane • Fixed Tower Crane • Teleporter • Road Sweeper
Delivery Vehicle	• Stone Delivery Truck • Bituminous Material Truck • Concrete Truck • Hiab Lorry
Staff / Site Vehicle	• 4 X 4 Vehicle • Commercial Van / Jeep

10.3 Construction Traffic Management Plan Contents

The Contractor will be contractually required to ensure that the elements of this CTMP shall be incorporated by the Contractor into the CTMP. The Contractor shall also agree and implement monitoring measures to confirm the effectiveness of the mitigation measures outlined in the CTMP. On finalisation of the CTMP, the Contractor shall adopt the plan and associated monitoring measures. The finalised CTMP shall address the following issues (including all aspects identified in this CTMP):

- Site Access & Egress;
- Traffic Management Signage;
- Timings of Material Deliveries to Site;

- Traffic Management Speed Limits;
- Road Cleaning;
- Vehicle Cleaning;
- Road Condition;
- Road Closures;
- Enforcement of Traffic Management Plan;
- Emergency Procedures During Construction;
- Communication.

These items are explained in detail in the remainder of this section of the report.

10.3.1 Site Access & Egress

The site access and egress locations for construction will be finalised once a Contractor has been appointed. It is anticipated that there will be a single point of access and egress to the main construction site to the East and another to the main construction compound to the West. Construction traffic to and from the site is outlined in **Section 5.12** of the EIAR and effects of the construction traffic is assessed in **Section 7.7**. The Contractor shall provide advanced warning signs, in accordance with **Chapter 8** of the Department of Transport, Tourism and Sport Traffic Signs Manual 2010, on the approach to proposed site access locations a minimum of one week prior to construction works commencing at the site.

10.3.1.1 Local Road Network

The following regional and local roads will be utilised as the primary routes to the site during the construction period:

- N28 – North of Shannon Park Roundabout;
- R611 – South of Shannon Park Roundabout;
- R610 Raffeen Bridge – North of N28;
- L6473 Raffeen Road – North of N28;
- R613 Barnahely Rd – South of N28.

10.3.1.2 Site Compounds

The main construction compound containing construction staff accommodation, welfare facilities, car parking etc. will be located in the western part of the site, to the west of the Hammond Lane facility entrance. It is likely that there will be a secondary, smaller compound on the main construction site to the east of the Hammond Lane entrance.

10.3.2 Traffic Management Signage

The Indaver contract management team shall undertake consultation with Cork County Council for the purpose of identifying and agreeing signage requirements. Such signage shall be installed by either Indaver or the Contractor prior to works commencing on site.

Proposed signage may include warning signs to provide warning to road users of the works access/egress locations and the presence of construction traffic. All signage shall be provided in accordance with the Department of Transport's Traffic Signs Manual, November 2010 - **Chapter 8 *Temporary Traffic Measures and Signs for Roadworks***.

In summary, the Indaver contract management team will be required to ensure that the following elements are implemented:

- Consultation with the relevant authorities for the purpose of identifying and agreeing signage requirements.
- Provision of temporary signage indicating site access route and locations for Contractors and associated suppliers.
- Provision of general information signage to inform road users and local communities of the nature and locations of the works, including project contact details.

10.3.3 Timings of Material Deliveries to Site

In order to reduce impacts on local communities and residents adjacent to the proposed sites, it is proposed that:

- Construction staff and vehicles will not be present on the local road network from 07:00-09:00 and from 16:00-18:00.
- In the event of another major construction project being active in the vicinity of the site, the Contractor, through the Indaver contract management team will be required to liaise with the management of other construction projects and the local authorities to co-ordinate deliveries.
- The Contractor will be required to schedule deliveries in such a way that construction activities and deliveries activities do not clash, resulting in build-up of traffic on road network.
- A construction phase programme of works shall be developed by the Contractor in liaison with the Indaver contract management team and Cork County Council, specifically taking into account potential road repair works that are included in the local authority's road works schedule.
- The Contractor will be required to co-ordinate with Indaver contract management team ensure that construction related traffic will not conflict with local activities and sensitive events such as funerals.

- Construction activities will be undertaken during permitted hours for all construction stages. It is anticipated that at critical certain stages of the construction works night time and weekend work will be required.

10.3.4 Traffic Management Speed Limits

Adherence to posted / legal speed limits will be emphasised to all staff / suppliers and contractors during induction training. Drivers of construction vehicles / HGVs will be advised that vehicular movements in sensitive locations, such as local community areas, shall be restricted to 60km/h. Special speed limits of 30km/h shall be implemented for construction traffic in sensitive areas such as school locations. Such recommended speed limits will only apply to construction traffic and shall not apply to general traffic. It is not proposed to signpost such speed limits in the interest of clarity for local road users.

10.3.5 Road Cleaning

It shall be a requirement of the works contract that the Contractor will be required to carry out road sweeping operations to remove any scheme related dirt and material deposited on the local road by construction / delivery vehicles. Road Sweepers will dispose of material following sweeping of the local road, to a licensed waste facility.

10.3.6 Vehicle Cleaning

It shall be a requirement of the works contract that the Contractor will be required to provide wheel washing facilities, and any other necessary measures to remove mud and organic material from vehicles exiting sites.

Chute washout will be carried out at designated locations only. These locations will be signposted throughout the construction site. The concrete plant and all delivery drivers will be informed of their location with the order information and on arrival on site. Chute washout locations will be provided with appropriate designated, contained impermeable area and treatment facilities including adequately sized settlement tanks. The clear water from the settlement tanks shall be pH corrected prior to discharge (which shall be by means of one of the construction stage settlement facilities) or alternatively disposed of as waste in accordance with the CWMP.

10.3.7 Road Condition

The extent of the heavy vehicle traffic movements and the nature of the payload may create problems of:

- Fugitive losses from wheels, trailers or tailgates.
- Localised areas of subgrade and wearing surface failure.

The Contractor shall ensure that:

- Loads of materials leaving each site will be evaluated and covered if considered necessary to minimise potential dust impacts during transportation.
- The transportation contractor shall take all reasonable measures while transporting waste or any other materials likely to cause fugitive losses from a vehicle during transportation to and from site, including but not limited to:
    - Covering of all waste or material with suitably secured tarpaulin/ covers to prevent loss.
    - Utilisation of enclosed units to prevent loss.

10.3.8 Road Closures

The upgrade to the local road L2545 as described in **Section 5.3.2** of the EIAR will be carried out in advance of the main site construction works. It is not anticipated that there will be any road closures required and a temporary two-way road will be constructed to the south of the existing L2545 to avoid this.

10.3.9 Enforcement of Traffic Management Plan

All project staff and material suppliers will be required to adhere to the CTMP. As outlined above, the Contractor shall agree and implement monitoring measures to confirm the effectiveness of the CTMP and compliance will be monitored by the Indaver contract management team. Regular inspections / spot checks will also be carried out to ensure that all project staff and material supplies follow the agreed measures adopted in the CTMP.

10.3.10 Communication

The Contractor, through the Indaver contract management team, shall ensure that close communication with the relevant local authorities and the emergency services shall be maintained throughout the construction phase. Such communications shall include:

- Updates to the CTMP as necessary.
- updates to construction programming.
- Information relating to local and community events that could conflict with proposed traffic management measures and construction traffic in order to implement alternative measures to avoid such conflicts.

The Contractor, through the Indaver contract management team, shall also ensure that the local community is informed of proposed traffic management measures in advance of their implementation. This communication will primarily be achieved through the Community Liaison Committee which will be established in line with Condition 18 of the ABP Planning Permission. This is described in more detail in **Section 12** below.

Such information may also be disseminated by posting advertisements in local newspapers or delivering leaflets to houses in the affected areas. Such information shall contain contact information for members of the public to obtain additional information and to provide additional knowledge such as local events, sports fixtures etc. which may conflict with proposed traffic management measures.

10.3.11 Conclusions

This CTMP will form part of the construction contract and is designed to reduce possible impacts which may occur during the construction of the proposed development.

The CTMP shall be used by the appointed contractor as a basis for the preparation of a finalised CTMP and shall detail, at a minimum, the items detailed in this CTMP and any subsequent requirements of the local authorities and ABP.

The Indaver contract management team shall be responsible for ensuring that the Contractor manages the construction activities in accordance with this CTMP and shall ensure that any conditions of planning are incorporated into the finalised CTMP prepared by the appointed works Contractor.

11 Environmental Awareness Training Strategy

All of the Contractor's site personnel will receive relevant and appropriate training to ensure that they have the appropriate knowledge to successfully implement the CEMP. The use of the term "Contractor's site personnel" in this CEMP is intended to include the site personnel of all subcontractors whom the Contractor has subcontracted part of the works. The term is also intended to include the site personnel of any specialists, nominated subcontractors, etc. Training will include that detailed below.

11.1 CEMP, EIAR, NIS and Contractual Requirement Briefing

The SEM will provide a briefing for all of the Contractor's senior management including the Project Manager, Programme Manager, Construction Manager, Design Engineers, Structures Agents and Site Agents on the CEMP and the Environmental Commitments/Requirements that must be met during the construction phase. The Indaver contract management team will be monitoring compliance with the CEMP.

11.2 Environmental Induction Training

The SEM will provide Environmental Induction Training for all senior management, the contents of which will be included in the finalised CEMP. All other site personnel will receive environmental induction in conjunction with safety induction training. No person will work on site without first receiving the site safety and environmental induction. Records of training will be kept for all environmental training provided and copies of training records will be given to the SEM.

11.3 Task Specific Training

Where a site-specific method statement/plan has been devised for a works activity (e.g. working in an area where non-native invasive species are present or waste management), all Contractor site personnel involved in that activity will be given a toolbox talk outlining the Environmental Control Measures. The foreperson will be responsible for providing the toolbox talk and for providing training records to the SEM.

12 Communications Strategy

This section sets out the communications strategy which will be adopted during the construction phase. A good communications strategy promotes awareness, education and information sharing on a particular project's progress. The procedures adopted for internal and external communication of information regarding the specific elements of the proposed development strategy will be finalised by Indaver in consultation with the Contractor.

12.1 Public Communications Strategy

The Indaver contract management team will put in place a Public Communications Strategy which will provide a two-way mechanism for members of the public to communicate with a designated Indaver staff member and for the Contractor to communicate important information on various aspects of the proposed development to the public. The forum for this interaction will be the Community Liaison Committee (CLC) which will be established to comply with Condition 18 of the ABP planning permission for the proposed development.

The CLC shall comprise seven members having an independent chairperson, two local community representatives, two elected members of the planning authority, one official of the planning authority and one representative from Indaver. Once established, an agreed calendar of regular meetings will be set up to ensure that ongoing information and updates in relation to the project can be effectively communicated and information about upcoming local events can be shared.

The public communications strategy, which will be finalised by Indaver in consultation with the Contractor, will include:

- procedures to inform members of the community (outside of the normal schedule of meetings with the CLC) directly affected by the construction phase on schedules for any activity of a particularly disruptive nature which is likely to impinge on their property such as road closures and diversions, pile driving and any mitigating actions that are being taken (shielding, restriction on work hours, etc.) to minimise such disruption.
- Details of a contact name and number for any complaints that may arise during such works.

A complaints register will form part of the communications strategy and all complaints will be handled in an efficient manner. The register will have prescribed methodologies for documenting and actioning complaints received from the community and other relevant stakeholders.

12.2 Internal Communication

The Contractor will put in place an internal communications strategy which will include procedures for effective internal communications. The strategy, which will be finalised by the Contractor will include measures such as the following:

- The site management meeting will include environmental issues on the agenda
- Weekly site safety meetings will include environmental issues on the agenda
- The SEM will report on environmental issues to the site management meetings
- The SEM will attend the weekly meetings.

13 Inspections, Auditing and Monitoring Compliance Strategy

This section outlines the inspections, auditing and monitoring compliance strategy that will be finalised by the Contractor.

13.1 Inspections

The Site Environmental Manager (SEM), who has been identified as being responsible for the successful development, implementation and maintenance of the CEMP, will carry out environmental inspections at appropriate intervals. Where appropriate and when required, the SEM will arrange to be accompanied on these environmental inspections by qualified and accredited environmental professionals, whose knowledge and experience may cover the fields of ecology, hydrology, hydrogeology, landscape architecture, noise, air quality and other environmental sciences. The locations, frequency and nature of the inspections will depend on the nature of the construction activities being carried out and the sensitivity of the surrounding environment. The inspection strategy will be finalised by the Contractor. The SEM will append the reports of the environmental inspections to the CEMP and the results of the inspections will be discussed at the weekly site safety and environmental meetings.

13.2 Monitoring

The Contract documents, EIAR, NIS, Conditions and/or Modifications imposed by ABP, Schedule of Environmental Commitments, environmental legislative requirements, the provisions of licences and the results of consultations with contractually or legally prescribed third parties may require the execution of certain types of monitoring (e.g. water quality, noise and vibration and/or air quality modelling, etc.).

The SEM will draw up a schedule of monitoring required, listing the type of report expected and detailing to whom the reports should be sent, etc. It is the responsibility of the SEM to ensure that all monitoring is carried out by competent persons.

Where the monitoring results fall outside the range contractually required, the SEM is responsible for initiating and reporting on corrective action. This may require the alteration of relevant Environmental Control Measures.

13.3 Audits

The SEM in conjunction with the Construction Manager, will carry out an audit of the CEMP on each quarterly anniversary of the commencement date to determine whether the CEMP is effective in ensuring that the Contractor is meeting all Environmental Commitments/Requirements. Where required as a result of such audits, the SEM will make all necessary changes to the CEMP and bring them to the attention of the Construction Manager, etc. All changes to the CEMP will be made by the SEM and approved by the Construction Manager and the Indaver contract management team. The reports of these audits will be annexed to the CEMP. The SEM will track environmental legislation and any changes in the legislation that could affect the CEMP will be brought to the attention of the Construction Manager and the Indaver contract management team.

Appendix A

List of Wastes- Chapter 17, Construction and Demolition Waste (including Excavated Soil from Contaminated Sites)

A. List of Waste Chapter 17, Construction and Demolition Waste (including Excavated Soil from Contaminated Sites)

17	CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)
17 01	**concrete, bricks, tiles and ceramics**
17 01 01	concrete
17 01 02	bricks
17 01 03	tiles and ceramics
17 01 06*	mixtures of, or separate fractions of concrete, bricks, tiles and ceramics containing hazardous substances
17 01 07	mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06
17 02	**wood, glass and plastic**
17 02 01	wood
17 02 02	glass
17 02 03	plastic
17 02 04*	glass, plastic and wood containing or contaminated with hazardous substances
17 03	**bituminous mixtures, coal tar and tarred products**
17 03 01*	bituminous mixtures containing coal tar
17 03 02	bituminous mixtures other than those mentioned in 17 03 01
17 03 03*	coal tar and tarred products
17 04	**metals (including their alloys)**
17 04 01	copper, bronze, brass
17 04 02	aluminium
17 04 03	lead
17 04 04	zinc
17 04 05	iron and steel
17 04 06	tin
17 04 07	mixed metals
17 04 09*	metal waste contaminated with hazardous substances
17 04 10*	cables containing oil, coal tar and other hazardous substances
17 04 11	cables other than those mentioned in 17 04 10

17 05	**soil (including excavated soil from contaminated sites), stones and dredging spoil**
17 05 03*	soil and stones containing hazardous substances
17 05 04	soil and stones other than those mentioned in 17 05 03
17 05 05*	dredging spoil containing hazardous substances
17 05 06	dredging spoil other than those mentioned in 17 05 05
17 05 07*	track ballast containing hazardous substances
17 05 08	track ballast other than those mentioned in 17 05 07
17 06	**insulation materials and asbestos-containing construction materials**
17 06 01*	insulation materials containing asbestos
17 06 03*	other insulation materials consisting of or containing hazardous substances
17 06 04	insulation materials other than those mentioned in 17 06 01 and 17 06 03
17 06 05*	construction materials containing asbestos
17 08	**gypsum-based construction material**
17 08 01*	gypsum-based construction materials contaminated with hazardous substances
17 08 02	gypsum-based construction materials other than those mentioned in 17 08 01
17 09	**other construction and demolition wastes**
17 09 01*	construction and demolition wastes containing mercury
17 09 02*	construction and demolition wastes containing PCB (for example PCB-containing sealants, PCB-containing resin-based floorings, PCB-containing sealed glazing units, PCB-containing capacitors)
17 09 03*	other construction and demolition wastes (including mixed wastes) containing hazardous substances
17 09 04	mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03

Any waste marked with an asterisk (*) is considered as a hazardous waste