6 Population and Human Health

6.1 Introduction

This chapter addresses potential impacts of the proposed Ringaskiddy Resource Recovery Centre on human beings, population and human health.

The proposed development will consist principally of a waste-to-energy facility (waste incinerator) for the treatment of up to 240,000 tonnes per annum of residual household, commercial and industrial non-hazardous and hazardous waste and the recovery of energy. Of the 240,000 tonnes of waste, up to 24,000 tonnes per annum of suitable hazardous waste will be treated at the facility.

In addition to the provision of the waste-to-energy facility, the proposed development will include an upgrade of a section of the L2545 road, a connection to the national electrical grid, an increase in ground levels in part of the site, coastal protection measures above the foreshore on Gobby Beach and an amenity walkway to the Ringaskiddy Martello tower.

The proposed development has the potential to impact upon population and human health in several ways. The potential impacts on population and human health arise from traffic, visual effects, built and natural heritage, air and noise emissions and climate change, all of which are dealt with in the specific chapters in this EIS dedicated to those topics. In this chapter, issues such as health and safety, social consideration, land-use, zoning and economic activity are examined.

6.2 Methodology

6.2.1 Introduction

This chapter has been prepared having regard to the following guidelines:

- Revised Guidelines on the Information to be Contained in Environmental Impact Statements (Environmental Protection Agency, draft September 2015);
- Advice Notes for Preparing Environmental Impact Statements Draft September 2015
- Guidelines on the Information to be contained in Environmental Impact Statements (EPA 2002)
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA 2003)
- Guidelines for treatment of tourism in an Environmental Impact Statement (Fáilte Ireland, 2011)

The appraisal of likely significant effects of the proposed development on population and human beings was conducted by reviewing the current socio-economic environment in the areas close to the proposed development. The site is located within the Carrigaline Electoral Division. Baseline information with

respect to the demographic and employment characteristics of the resident population within the catchment area was sourced from the 2002, 2006 and 2011 Censuses (where available). The data included information on population, structure, age profile, and household size, number of persons at work and unemployment profile. Information was also sourced from the following documents/websites:

- Cork County Development Plan 2014
- Carrigaline Electoral Area Local Area Plan (Edition 2) 2015
- Central Statistics Office (CSO) website www.cso.ie
- The Department of Education and Sciences website www.education.ie

During the preparation of this EIS, consultations were held with a number of parties in order to ensure that environmental issues, including socio-economic, recreational and amenity issues relating to the project were addressed. The parties consulted are listed in Appendix 1.2 of **Chapter 1** ***Introduction*** of this EIS.

Impacts on health were addressed as part of the following assessments and are summarised in this chapter:

- Hazard Identification and Risk Assessment Study (Refer to **Appendix 6.1**)
- Health impact assessment (Refer to **Appendix 6.2**)
- Soil dioxin and dibenzofuran (PCDD/F) monitoring programme (Refer to **Appendix 6.3**)
- Modelling of PCDD/F Intake for the proposed development (Refer to **Appendix 6.4**)

6.3 Receiving Environment

6.3.1 Project Location

6.3.1.1 Site Description

The site for the Ringaskiddy Resource Recovery Centre is located approximately 15km to the south-east of Cork City, in the townland of Ringaskiddy on the Ringaskiddy Peninsula in the lower part of Cork Harbour. The site occupies an area of approximately 13.55 hectares and is located approximately 800m east of the village of Ringaskiddy.

The L2545, the main road from Ringaskiddy village to Haulbowline Island, forms the northern boundary of the site. The eastern boundary of the site extends to the foreshore of Cork Harbour along Gobby Beach. The site surrounds the Hammond Lane Metal Recycling Co Ltd facility. Refer to **Figures 1.1** and **1.2** of **Chapter 1** ***Introduction*** of this EIS which show the site location.

6.3.1.2 Immediate Vicinity

The site encircles the Hammond Lane Metal Recycling Company facility. The facility contains several metal buildings, concrete walls, and some large pieces of

machinery. Hammond Lane expanded its facilities in 2015. There is also an ESB Networks compound (Lough Beg substation) located adjacent to the eastern boundary of the Hammond Lane facility. Refer to **Figures 4.1** to **4.6** of **Chapter 4** ***Description of the Proposed Development*** of this EIS.

The L2545 is an extension of the N28 that leads from Ringaskiddy past the proposed development site and over the bridge to the crematorium on Rocky Island and Haulbowline Naval base.

The Irish Maritime and Energy Research Cluster (IMERC) campus is being developed on the northern side of the L2545 road, which forms the northern boundary of the site. The National Maritime College of Ireland (NMCI), the first major component of IMERC, opened in 2004. The Beaufort Research Laboratory (construction completed in 2015), is located on the site to the east of the National Maritime College of Ireland, will be IMERC's second major building. Further developments for IMERC will be located on the remainder of the land to the east of the National Maritime College of Ireland.

Some warehouses are located on the northern side of the L2545 road, to the west of the National Maritime College of Ireland.

The land to the immediate south of the Indaver site is owned by IDA Ireland and is in agricultural use. Refer to **Figures 4.3 to 4.6** of **Chapter 4** ***Description of the Proposed Development*** of this EIS. Just beyond the southern boundary, the site is further visually defined by the high voltage electricity line that runs west overhead to connect with the ESB sub-station near Shanbally and east (then north) to Haulbowline Island. Further to the southwest, the land continues to rise slightly to create the ridgeline on which a Martello Tower is located at the highest point (43m OD).

The land to the west of the site is in agricultural use. Further to the west there is a single, large, white-painted residential property (Ring House) located approximately 50m from the site boundary, set within a field and surrounded by trees.

The eastern section of the M28 Cork to Ringaskiddy Motorway Scheme is proposed to cross the far western part of the Indaver site. The scheme, proposed by Transport Infrastructure Ireland (TII) (formerly the National Roads Authority) has not yet been published. Refer to **Figure 4.7** of **Chapter 4** ***Description of the Proposed Development*** of this EIS which shows an indicative location of the proposed M28 Cork to Ringaskiddy Motorway Scheme in the vicinity of the Indaver site.

6.3.1.3 The Wider Area

The centre of Ringaskiddy village is located approximately 800m to the west of the site of the proposed development. The Port of Cork's port facilities are located to the north of Ringaskiddy village.

The Ringaskiddy peninsula is industrial in character, with a number of pharmaceutical companies having large manufacturing facilities in the area, in addition to the Port of Cork facilities. The locations of some of these industries are shown in **Figures 4.3 to 4.6**. Recent additions to the Ringaskiddy area include three 100m hub-height wind turbines, located on industrial sites. A fourth

similar wind turbine has received planning permission. The DePuy wind turbine is located to the south of the Indaver site.

The Cork Harbour area has a mixture of urban developments, such as Cobh, Rushbrooke and Monkstown, and pockets of industry near the shore. Spike Island is located approximately 500m to the east of the site, with the disused Fort Mitchell prison being situated there. There is an Irish Naval Service base situated on Haulbowline Island (refer to **Figure 4.3**) and a crematorium on Rocky Island. Both islands lie to the north of the site.

6.3.2 Principal Potential Receptors

An appraisal of the principal potential receptors within the environs of the proposed facility including homes, schools and commercial and industrial premises was conducted and is detailed below.

6.3.2.1 Homes

According to the Carrigaline Electoral Area LAP 2011, the settlement of Ringaskiddy comprises two small villages, Shanbally and Ringaskiddy. The LAP (Section 4.7) states that *there is very limited expansion potential for residential uses because of the importance of the area for future industrial development* (2011). No land is zoned for residential development in Ringaskiddy, in the LAP.

The nearest residence is adjacent to the western boundary of the site, and will be located approximately 400 metres from the main process building in the resource recovery centre.

6.3.2.2 Haulbowline Naval Base

Haulbowline is an island of about 84 acres which is linked by bridge to Ringaskiddy. Haulbowline is State property and is the headquarters of the Irish Navy. Planning permission was granted by An Bord Pleanála to Cork Council to develop Haulbowline Island as a public park in May 2014 (ABP reference: MT0001).

6.3.2.3 Childcare Facilities

Ferryview Childcare Centre is located at the entrance to the Ferryview housing estate, approximately 650m west of the site.

6.3.2.4 Health, Social, and Community Facilities

Local area facilities include the Community Centre at Ringaskiddy. Churches located in the study area include those located at Ringaskiddy, Shanbally, Monkstown, Passage West, Carrigaline and Cobh.

6.3.2.5 Schools and Colleges

As discussed previously IMERC and the NMCI are located across the L2545 road from the site. Details are provided in Table 6.1 below on primary and post primary schools located in the study area. The distances calculated are the linear distance from entrance to the main site where the process building will be located to the particular educational facility.

There is one primary school within Ringaskiddy Village – Ringaskiddy Lower Harbour National School which is located within the village. Shanbally National School is situated approximately 1.45km west of Ringaskiddy West, adjacent to the N28.

Table 6.1 Primary and Post Primary Schools in the Area

School Type	Name	Address	Distance from Main Site
Primary	Ringaskiddy Lr. Harbour NS	Ringaskiddy	1.3 km
Primary	Shanbally NS	Shanbally	3.3 km
Primary	Star of the Sea	Passage West	4.5 km
Primary	Monkstown NS	Monkstown	2.7 km
Primary	Rushbrooke Convent of Mercy NS	Rushbrooke	2.4 km
Primary	Gaelscoile Cobh	Cobh	2.9 km
Primary	Cobh NS	Cobh	2.7 km
Primary	Walterstown NS	Cobh	6.2 km
Primary	S N Seosamh	Cobh	2.8 km
Primary	St. Mary's Convent NS	Cobh	9.3 km
Primary	St. Mary's	Carrigaline	5.7 km
Primary	Carrigaline Boys NS	Carrigaline	6.1 km
Primary	St. John's Girls NS	Carrigaline	6.5 km
Primary	Gaelscoil Charraig Uí Leighinn	Carrigaline	5.7 km
Primary	An Charraig Christian School	Carrigaline	7.3 km
Primary	Sonas Special Primary School	Carrigaline	6.1 km
Primary	Whitegate Mixed NS	Whitegate	4.9 km
Primary	Templebrady NS	Crosshaven	3.5 km
Primary	S N Bun an Tsabhairne	Crosshaven	3.2 km
Post Primary	Carrigaline Community School	Carrigaline	5.8 km
Post Primary	Coláiste Muire	Crosshaven	3.4 km
Post Primary	St.Peter's Community School	Passage West	4.5 km
Post Primary	Coláiste Muire	Cobh	2.7 km
Post Primary	Cobh Community School	Cobh	2.9 km

6.3.3 Heritage and Amenity

6.3.3.1 Heritage

Archaeological, architectural and cultural heritage are discussed in **Chapter 14 *Archaeological, Architectural and Cultural Heritage*** of this EIS. In summary, there are no recorded archaeological sites, no cultural heritage sites and no protected structures within the proposed development site. A Martello tower, listed in the Record of Monuments and Places, (RMP No. CO087-053---) and listed in the Record of Protected Structures (RPS 00575) stands approximately 70m to the south of the proposed development site. Refer to Chapter 14 for further details.

Ordnance Survey maps show that a path once led north-east through the proposed development site from the Martello tower to the sea shore at the eastern end of the Ringaskiddy peninsula. Refer to Chapter 14 for further details. Anecdotal evidence suggests that the site was used as a source of material for land reclamation elsewhere in Ringaskiddy, and that this accounts for the steep escarpment running east-west within the site. Although it is shown on historic maps, much of the path is no longer in existence, most likely due to the removal of soil in the past. There is no legal registered right-of-way along this path.

A farm track runs through waste-to-energy side of the site (east of Hammond Lane) from the L2545 to the southern boundary of the site. Although there is no legal registered right-of-way, the site appears to be used very occasionally as a pedestrian link between the shore and the Martello Tower.

Nature Conservation Areas are discussed in **Chapter 12 *Biodiversity*** of this EIS***.*** In summary, there are no environmental designations located within the site of the proposed development. The majority of the site is currently covered in scrub with some pockets of trees and open grass areas. Gobby Beach is located along the eastern boundary of the site. Cork Harbour Special Protection Area (SPA) is located 0.5km to the south of the site. Refer to Chapter 12 for further details.

Geological Heritage Sites (GHSs) are discussed in **Chapter 13 *Soils, Geology, Hydrogeology, Hydrology and Coastal Recession*** of this EIS. In summary, there are no Geological Heritage Sites (GHS) located within the site of the proposed development. There are two GHS sites in the general vicinity of the site. These are Golden Rock, located approximately 400m southeast and Lough Beg section, located approximately 1.4km south of the site. Refer to **Chapter 13** for further details.

Scenic routes and designated landscapes are discussed in detail in **Chapter 11 *Landscape and Visual Assessment*** of this EIS. In summary, there are some scenic routes and scenic landscape designations in close proximity to the site in the (Cork County Development Plan 2014). Refer to **Chapter 11** for further details.

6.3.3.2 Local Amenity

From a local amenity viewpoint, the N28 road which passes through Ringaskiddy Village is a busy road carrying port and industrial traffic twenty-four hours per

day. The road is the National Primary Route N28. It passes eastwards through Ringaskiddy Village as far as the junction with the entrance to the ferry port and the main road to Loughbeg, and continues eastwards as the L2545 past the Indaver site as the access road to Hammond Lane, the crematorium at Rocky Island, the National Maritime College of Ireland, the Beaufort Laboratory, the Naval Base on Haulbowline Island and Gobby beach.

Cork County Council, in association with Transport Infrastructure Ireland (TII) (formerly the NRA), plans to construct a new N28 dual carriageway road from the Bloomfield Interchange near Douglas to Ringaskiddy. This road which is currently being designed, will serve the future traffic needs of the area while removing traffic from Shanbally and Ringaskiddy Villages. The timeframe for construction of this road remains to be confirmed. The eastern section of the M28 Cork to Ringaskiddy Motorway Scheme is proposed to cross the far western part of the Indaver site.

The sandy/rocky shore at the eastern end of the peninsula at Ringaskiddy is known as Gobby beach. This beach is a local amenity served by a small public car park (Gobby Beach car park) and is frequently used by local residents for walking. There is a footpath to the Martello Tower from the main Ringaskiddy to Loughbeg Road. As discussed in Section 6.3.3.1 above, the site appears to be used very occasionally as a pedestrian link between the shore and the Martello Tower.

The deep water berth at Ringaskiddy is one of Cork Harbour's premier shore fishing locations. During the winter months, bottom fishing will produce Flatfish, Whiting and Codling. Ray is caught during the summer, while Coalfish and Conger can be caught all year round. Fishing is also carried out from the shore at Gobby beach.

Local sports clubs include Raffeen Creek Sports Club in Ringaskiddy which comprises Raffeen Creek Golf Club, Raffeen Creek Pitch and Putt Club and two soccer pitches. Shamrocks Hurling and Football Club is located in Shanbally, near Ringaskiddy. The Hibernian Soccer Club is also based in Shanbally.

Haulbowline Island is identified as an East Cork Bird Trail Hotspot. A bird reserve is located at Loughbeg.

The Ringaskiddy and District Residents Association received a grant of planning in 2014 for the construction of a community children's playground on a site adjacent to the N28 in Ringaskiddy Village.

In 2015, the Port of Cork received permission from An Bord Pleanála, for an expansion project, which includes for new public pier, slipway and boarding platform at Paddy's Point.

The East Tip, part of the Former Ispat Steelworks on Haulbowline Island, has planning permission and a waste licence for remediation works and redevelopment as a public park. An overall development master plan for the entire Island is currently being developed.

Cork County Council published a master plan for Spike Island in 2012. The master plan proposes that the Island is developed as a tourist and amenity destination with improved access, ferry links to other locations in the harbour, redevelopment of the existing buildings for compatible new uses, construction of

walking and cycling paths, an adventure centre, a retreat centre, a camp site and extensive landscaping. Limited tourist accommodation has been proposed. Spike Island is separated from the Indaver site by a channel (West Channel) which is circa 700m wide.

6.3.3.3 Amenity in Cork Harbour

There is extensive recreational use of Cork Harbour, mainly the Lower Harbour, for sea angling and boating. Leisure and recreational activities within the Harbour and its immediate surrounds include sailing, rowing, windsurfing, canoeing, angling, bird watching, swimming and walking. Sailing is a popular amenity in Cork Harbour and there are several sailing/yacht clubs in the Harbour including Lower Aghada Tennis and Sailing Club, East Ferry Marina, Cobh Sailing Club, Monkstown Bay Sailing Club and Royal Cork Yacht Club, which is in Crosshaven.

Meitheal Mara is a maritime cultural organisation based in Cork. It was founded in 1994 as a community employment Currach building project and frequently uses the harbour for boating activities. Meitheal Mara organises the annual Ocean to City Race for rowing boats and canoes.

Typically, boats use the main shipping channel (known as Cobh Road) which runs north of Haulbowline Island and Spit Bank, and north and east of Spike Island. Leisure craft including sailing and motor boats use the West Channel on occasion but there are depth restrictions due to the shallow nature of the channel and the presence of Curlane Bank to the south and Spit Bank to the north. Depths range from 0.2m to 5.9m (Chart Datum) and the channel is too shallow to be used as a shipping channel. Sailing race courses around the harbour pass in close proximity to Spike Island and there is an annual sailing race around Spike Island. The race takes place during the summer at a high tide (preferably spring tide) when there is enough depth in the channel for larger boats such as cruisers. Other annual sailing races in the Harbour include Cork Week, which is held every two years..

The Monkstown and Cork Harbour Rowing Club is based in Monkstown. Irish Coastal Rowing Federation Clubs which utilise Cork Harbour include Rushbrooke, Passage West, Commodore, Crosshaven, Blackrock, East Ferry, Cobh Fishermen, Maritime College and Naval Service rowing clubs.

Fota Estate, Fota House and Arboretum, Fota Wildlife Park, Fota Island Hotel and Spa and Fota Golf Club are situated on Fota Island, in the Upper Harbour. Other golf clubs around the Harbour area include Monkstown and Cork Golf Clubs.

Amenities in Passage West and Monkstown include a sea front walk which runs north to Hop Island, and a children’s playground which is located in Passage West. The children’s playground was built in Ringaskiddy in 2014.

6.3.4 Economic Activity

6.3.4.1 Tourism

In 2011, Fáilte Ireland published Guidelines on the treatment of tourism in an Environmental Impact Statement, noting that there are two interactions between tourism and the environment:

- Impacts caused by tourism projects (e.g. marinas and holiday villages)
- Impacts affecting tourism (e.g. the quality of a destination or a tourism activity).

The Guidelines note that the assessment of effects on tourism should be treated as a specialist sub-section of the topic 'Population and Human Health', with particular elements being considered, as appropriate within other sections, e.g. Landscape, Flora and Fauna and Cultural Heritage etc. Chapter 3 of the Guidelines list a number of factors – in order of priority are the reasons why tourists visit and enjoy Ireland. These factors have been considered where relevant in various sections of this EIS as follows:

Table 6.2 Reasons why tourists visit and enjoy Ireland in order of priority (according to the Guidelines). These are addressed in the relevant sections of this EIS

Factor	EIS Chapters / Notes
Beautiful scenery	Landscape and Visual (Ch 11) The guidelines note that "*there appears to be evidence that the visitors expectation of 'beautiful scenery' does not exclude an admiration of new modern developments – such as windfarms-which appear to be seen as indicative of a modern informed and responsible attitude to the environment*"
Friendly & hospitable people	The guidelines note that *"this is not an environmental factor though it is indirectly covered under the 'Human Beings' section of the EIS".* Refer to Section 6.3.4 for demographic details.
Safe & Secure	The Guidelines note that *"this is not an environmental issue though some of the factors that are sometimes covered under the heading of 'Human Beings' – such as social inclusion or poverty – can point to likely effects and interactions*". Refer to Section 6.5.3 for details on the HAZID assessment
Easy, relaxed pace of life	The Guidelines note that *"this is not an environmental issue though it is partially covered under 'Human Beings' see comments above".* Refer to 6.3 on receiving environment.
Unspoilt environment	Biodiversity (Ch 12), Landscape and Visual (Ch 11). Emissions are addressed in Air Quality (Ch 8), Climate (Ch9), Noise and Vibration (Ch10), Soils, Geology, Hydrology, Hydrogeology and Coastal Recession (Ch13) and Material Assets (Ch 15). Traffic is addressed in Roads and Traffic (Ch 7)
Nature, wildlife, flora	Biodiversity (Ch 12), Landscape and Visual (Ch 11) Emissions are addressed in Air Quality (Ch 8), Climate (Ch9), Noise and Vibration (Ch10), Soils, Geology, Hydrology, Hydrogeology and Coastal Recession (Ch13) and Material Assets (Ch 15). Traffic is addressed in Roads and Traffic (Ch 7) The guidelines note that "*this topic also considers the effect on physical access to and visibility of these sites*". Access to Gobby

Factor	EIS Chapters / Notes
	Beach during construction is addressed in Construction (Ch 5). Visibility is addressed in Landscape and Visual (Ch 11).
Interesting history and culture	Landscape and Visual (Ch 11) and Cultural heritage (Ch 14). The guidelines note that "*the principal issues are to avoid damage to sites and structures of cultural, historical, archaeological or architectural significance – and to their contexts or settings. It also considers the effect on physical access to and visibility of these sites"* Access and visibility to Martello tower is addressed in Landscape and Visual (Ch 11) and Cultural heritage (Ch 14).
Good range of natural attractions	Biodiversity (Ch 12), Landscape and Visual (Ch 11) and Cultural Heritage (Ch 14)
Plenty of things to see and do	The Guidelines note that "this is not an environmental issue though it is partially covered by the Human Beings section, where tourism resources of an area are described and assessed. Refer to Section 6.3.2 for details on heritage and amenity

Although Ringaskiddy is not currently a popular tourist destination, it is, and is expected to remain, an important tourist transit port.

Brittany Ferries operates a weekly car ferry service between Ringaskiddy and Northern France from April to October inclusive. A ferry with the capacity to transport 2,400 passengers arrives and departs from Ringaskiddy every Saturday. The deep water berth at Cobh has the capacity to handle very large cruise ships. Occasionally there are two or even three cruise ships in the Harbour. If the Cobh cruise ship berth is occupied, the other cruise ship or ships dock at Ringaskiddy. Approximately 60 cruise ships a year visit the Harbour. The cruise ships make a significant contribution to the local economy.

The lower harbour contains a number of important military fortifications such as Spike Island, Fort Davis, Fort Camden, Cobh Fort and Ringaskiddy Martello tower, which contribute to the rich heritage and character of the harbour. Though Ringaskiddy itself is not a tourist destination, strategic plans are being prepared to develop the area as a more significant tourism and recreational attraction. There are already regular tours from Cobh to the military fortification on Spike Island. The Spike Island master plan proposes that the Island is developed as a tourist and amenity destination with improved access, ferry links to other locations in the harbour, redevelopment of the existing buildings for compatible new uses, construction of walking and cycling paths, an adventure centre, a retreat centre, a camp site and extensive landscaping. Limited tourist accommodation has been proposed.

The Port of Cork facility is likely to undergo considerable change in the coming years, as permission has recently been granted for significant expansion of the facility, including the development of an amenity boat launch facility at Paddy's Point adjacent Haulbowline Bridge and Beaufort building. The Port of Cork's planning permission included a walkway along the northern shoreline. Similarly, both the imminent rehabilitation of the East Tip Island to a parkland landscape for amenity purposes, and the potential redevelopment of the former ISPAT/Irish Steel on Haulbowline Island and the proposed installation of an additional wind turbine at DePuy's plant at Loughbeg (planning application recently submitted to Cork County Council) will be forces of change in the landscape and visual environment of the Lower Harbour area.

6.3.4.2 Commercial and Industrial Premises

The majority of the Indaver site is zoned for industrial use designated as a Strategic Employment Area in the Carrigaline Local Area Plan 2011. Refer to **Figure 2.3** of Chapter 2. A small section of the overall Indaver site (located along the far western boundary of the site) includes lands zoned as open space, which characterises an area of open space that acts as a buffer between proposed industry and established uses. The zoning objective in the LAP states that while the patterns of land use will remain largely unchanged, if the adjoining land designated for industry is developed, consideration will be given to landscaping including strategic tree planting on the land.

Section 6.4.11 of the Cork County Development Plan 2014-2020 states that "the provision of strategic large scale waste treatment facilities will be considered in 'Industrial Areas' designated as Strategic Employment Areas in the local area plans subject to the requirements of National Policy, future Regional Waste Management Plans and the objectives set out in local area plans".

A considerable area of land in Ringaskiddy, including most of the site, is zoned for industrial development. IDA Ireland owns part of the industrial zoned land, with the remainder in private and Port of Cork ownership. IDA Ireland includes the Ringaskiddy area in its ongoing promotion of industrial development. Ringaskiddy is a significant centre of pharmaceutical manufacture at an international level. Since the late 1960s, some very large pharmaceutical manufacturing plants have been constructed in the area. Other businesses in the area include car importers, electronics manufacturing, and grain, cement and molasses storage. Commercial service companies in Ringaskiddy include a small convenience shop, a public house and a public house/restaurant on the main street of Ringaskiddy Village.

The Port of Cork, initially as Cork Harbour Commissioners, has been developing the Ringaskiddy port facilities since the early 1980s. The Port of Cork Company has a throughput of approximately 10 million tonnes per annum of cargo, and there are extensive port facilities in the Harbour. The Port of Cork estimates that 1,252 commercial ships entered the harbour in 2012. The Company operates a container and ferry port at Ringaskiddy. Its deepwater berth at Ringaskiddy is of major economic importance to the region. Facilities at the deepwater berth can handle a range of cargo types, including roll-on roll-off, lift-on lift-off and dry bulk.

Cargo ships service the Tivoli Container Port, approximately 6km to the north west of the site.

As discussed above, Port of Cork has received permission to redevelop its facilities at Ringaskiddy Port, Port of Cork proposes, on a phased basis, to transfer cargo handling activities from Tivoli and City Quays to Ringaskiddy in due course.

The land use and development policy for the Ringaskiddy area is for this industrial and port development to continue.

6.3.4.3 Commercial Fisheries

Vessels more than 12m in length are not permitted to fish within Cork Harbour. Vessels fish mainly out of Cobh and Crosshaven. Boats are engaged in potting

for lobster, edible or brown crab, Velvet crab and the common shore or green crab. Shrimp are also potted extensively in late summer and autumn. A limited amount of mullet fishing takes place during the summer months and trawling takes place, particularly later in the year for codling and flat fish. The channel between Spike Island and the Ringaskiddy shore is occasionally used as a trawling route for boats fishing for species such as plaice, skate and flounder when the conditions outside the harbour are too inclement for fishing. The edges of the channel below the low water mark are used for potting for Green Crab, Velvet Crab and Shrimp.

Occasional scallop fishing is undertaken south of Cuskinny on the southern shore of Great Island. Potting is undertaken extensively from inside the Dognose Bank (Fort Davis/Carlisle) along the rocky coast on the eastern side of the Lower Harbour. Up to 2,000 pots can be laid in this area at any one time and in general the area is considered very productive for all potted species. Potting for Shrimp, Crab and Lobster is also undertaken along the Great Island shore, east of Cuskinny, and to a limited extent in the East Ferry channel. Green crab is also fished in the North Channel, north of Great Island.

Trawling is undertaken in several places around the harbour especially along the shelf bordering the main channels.

Netting for Mullet is undertaken around Aghada, mainly during the summer.

Over-fishing is a threat to all fisheries and responsible management and conservation of the resources are required if long-term sustainability is to be ensured. In light of this, Lobster conservation measures have been adopted by the Cork Harbour fishermen in line with their counterparts around the Irish Coast.

6.3.4.4 Aquaculture

Mussel culture is totally banned in Cork Harbour because of the prevalence of the organisms that cause Paralytic Shellfish Poisoning. Oysters are the main species cultivated. There is a licence for oyster farming in force in the eastern part of the Harbour, approximately east of a line from Long Point to Cuskinny.

Great Island North is one of 63 designated shellfish growing sites around the Irish coastline. This designation requires minimum standards of water quality to be maintained. It also obligates public authorities to report information relevant to water quality in designated areas to the Department of the Environment, Heritage and Local Government.

6.3.5 Demographics

6.3.5.1 Recent Trends in Population

The smallest geographical units distinguished by the Central Statistics Office (CSO) are Electoral Divisions.

Local electoral areas were reconfigured in 2014 following recommendations made by the Local Electoral Area Boundary Committee. Population statistics have not been gathered or categorised using the new electoral districts to date.

The sections below are based on the pre-2014 electoral districts for which population data is available.

Prior to 2014, the Indaver site was located in the Carrigaline Electoral Division within The Cork Rural Area. The Cork Rural area comprised 30 Electoral Divisions and constituted the wider hinterland surrounding the site (excluding Cork City). Under the revised Electoral Area boundaries, the Indaver site is located within the Carrigaline Electoral Division within the Ballincollig-Carrigaline Electoral Area. The Ballincollig-Carrigaline Electoral Area is comprised of eight Electoral Divisions in total.

Table 6.3 outlines the population change between 2006 and 2011 and the growth rate of these population figures.

Table 6.4 outlines the population change and growth rate of the main towns near Ringaskiddy between 2006 and 2011.

Table 6.3 Population of State, County Cork, Cork City, Cork Rural Area and Carrigaline Electoral Division 2002-2011

District	2006	2011	Change from 2006-2011 (%)
State	4,239,848	4,588,252	+8.2
Cork (County and City)	481,295	519,032	+7.8
Cork County	361,877	399,802	+10.5
Cork City	119,418	119,230	-0.2
Cork Rural Area	119,520	131,100	+9.7
Carrigaline (Electoral Division No 82)	10,969	11,818	+7.7

(Data source: CSO website www.cso.ie)

Cork Rural Area includes Carrigaline Electoral Division (No 82) within which Ringaskiddy village is located.

Table 6.4 Population of Main Towns near Ringaskiddy 2002-2011

District	2006	2011	Change from 2006-2011 (%)
Cork City	119,418	119,230	-0.2
Cork Suburbs	70,966	79,352	+11.8
Carrigaline Town (including) Ringaskiddy	12,835 514	14,775 478	+15.1 -7.0
Cobh Town and environs	11,303	12,347	+9.2
Passage West and environs	5,203	5,790	+11.3
Crosshaven	1,669	2,093	+25.4
Total	221,394	223,587	+5.5

(Data source: CSO website www.cso.ie)

Note: 'Carrigaline Town' comprised 3 Electoral Divisions (No.82 in Cork Rural Area and No.s 183 & 193 in Kinsale Rural Area). Ringaskiddy was included in the count for Carrigaline Town because it formed part of Carrigaline Electoral Division No 82. Cobh Town and environs comprises Cobh

Urban Electoral Division and part of Cobh Rural Electoral Division. Passage West Town and environs comprised Monkstown Urban Electoral Division and part of Monkstown Rural Electoral Division. Crosshaven Town formed part of Templebreedy Electoral Division (Kinsale Rural Area).

The populations of the towns in the area increased in the period.

6.3.5.2 Household Size

Table 6.5 below outlines the average household size in each of the geographical areas assessed. The statistics illustrate an increase in household size from 2006 to 2011, contrary to the national trend which was a decrease in household size. However, the household size in the area of the proposed development (Carrigaline Electoral Division) is still higher than the State, City and County for 2006.

Table 6.5 Average Household Size (persons per household)

District	2006	2011
State	2.81	2.70
Cork County	2.88	2.80
Carrigaline Electoral Division	2.96	Not available

(Data source: CSO website www.cso.ie)

6.3.5.3 Age Profile

Table 6.6 below outlines the age profile of the population in terms of dependent age cohorts (0-14 and 65+) and working age cohorts (15-64) over a five year period between 2006 and 2011. The statistics show that in 2006 a below-average proportion within the dependant age groups resided in Carrigaline Electoral Division (29.3%) compared to the State (31.4%). A higher percentage (51.7%) of the population in the Carrigaline Electoral Division fall within the childbearing age group compared to the State (46.6%) in 2006.

Table 6.6 Population of each catchment categorised into independent, dependent and childbearing cohorts 2002-2011

District	0-14 & 65+ yrs Dependent (%)	15-64 yrs independent (%)	15-44 yrs childbearing (%)
State 2006	31.4	68.6	46.6
State 2011	33.2	66.9	44.3
Cork County 2006	32.3	67.7	45.5
Cork County 2011	34.1	65.9	42.7
Carrigaline ED 2006	29.3	70.7	51.7
Carrigaline ED 2011	Not available	Not available	Not available

(Data source: CSO website www.cso.ie)

Table 6.7 shows the age cohorts for 2011 across the State, Cork City, Cork County and Carrigaline Town. The statistics were not available for the Carrigaline Electoral Division in this format.

Statistics show Carrigaline Town has an above average proportion aged 0-14 (27.2%) compared to the State (21.3%), Cork City (14.7%) and Cork County

(21.1%). The 2011 statistics show that Carrigaline Town also has an above average proportion aged 25-44 (35.6%) compared to the State (31.6%), Cork City (30.6%) and Cork County (31.2%).

Table 6.7 Age cohort 2011

District	0-14	15-24	25-44	45-64	65+	Total
State 2011	21.3%	12.6%	31.6%	22.7%	11.7%	4,588,252
Cork City 2011	14.7%	16.8%	30.6%	22.9%	15.1%	119,230
Cork County 2011	21.1%	12.6%	31.2%	23.1%	12%	519,032
Carrigaline Town 2011	27.2%	11.6%	35.6%	20.2%	5.3%	14,775
Carrigaline ED 2011	Not available in this format					11,818

(Data source: CSO website www.cso.ie)

Table 6.8 shows age cohorts for Carrigaline Town for 2006 and 2011. The proportion of people aged 0-14 in Carrigaline Town increased between 2006 and 2011 from 25.5% to 27.2%.

Table 6.8 Age cohort for Carrigaline Town 2006 - 2011

District	0-14	15-24	25-44	45-64	65+	Total
Carrigaline Town 2006	25.5%	13.6%	38%	18.4%	4.5%	12,835
Carrigaline Town 2011	27.2%	11.6%	35.6%	20.2%	5.3%	14,775

(Data source: CSO website www.cso.ie)

In summary, it is evident that Carrigaline Town and Electoral Division has a young and growing population. Carrigaline Electoral Division has a below average proportion of people within the dependant age groups, an above average proportion within the working and childbearing groups, and a household size slightly above the State average as seen in the 2006 statistics.

6.3.6 Recent Trends in Employment

Recent trends in employment were evaluated using CSO information generated from the 2006 and 2011 Censuses and Small Area population statistics. The information was compiled on the basis that:

- The labour force is defined as the sum of people aged 15 years and over who are at work or who are employed.
- The participation rate is the proportion of persons in the labour force aged 15 years and over expressed as a percentage of all persons in that age group.

Statistics shown in **Tables 6.8** and **6.9** below outline the employment figures for the State, Cork City and Cork County, and in the main towns near Ringaskiddy, respectively

Tables 6.8 and **6.9** show that there was a decrease in the total number of persons aged 15 years and over at work in the State and in Cork City and County in the period 2006-20011. Percentage rates of participation in the labour force also decreased during the same period.

Table 6.8 Employment Figures for the State and Cork City and County for Persons 15 Years and Over

Area	Total Persons		At Work		Unemployed (ex 1st time job seekers)		Total in Labour Force		% Rates of Participation in Labour Force	
	2006	2011	2006	2011	2006	2011	2006	2011	2006	2011
State	3,375,399	4,588,252	1,930,042	1,807,360	150,084	390,677	2,109,498	2,232,203	62.5	48.7
Cork City	101,254	119,230	48,892	43,062	6,923	11,251	55,296	55,328	54.6	46.4
Cork County	283,014	399,802	167,092	164,441	8,646	26,597	177,577	193,044	62.7	48.3

(Data source: CSO website www.cso.ie)

Table 6.9 Employment Figures for the main towns near Ringaskiddy (Persons 15 Years and Over)

Town	Unemployed (ex. first time job seekers)		At Work	
	2006	2011	2006	2011
Carrigaline	274	1,023	6,266	6,211
Cobh	355	967	5,147	4,702
Passage West	145	426	2,429	2,317
Crosshaven	49	128	717	824

(Data source: CSO website www.cso.ie)

National Quarterly Household Survey

The National Quarterly Household Survey Statistics for the third quarter (July to September) of 2015 show that there were 1,983,000 persons in employment in the State during that quarter, which is an annual increase of 56,000 persons or +2.9%. There were 203,000 persons unemployed in the third quarter of 2015, a decrease of 42,500 in the year. Overall, the labour force in the State increased by 13,500 or +0.6% over the year to 2,186,000 in the year (CSO, 2015.

Employment in the construction sector increased by 15,000 or +13.3% in the year to the third quarter to 2015.

The following table shows the distribution of employment sectors in 2011 in towns near Ringaskiddy. Manufacturing and wholesale and retail trade are significant employment groups in the area.

Table 6.11 Distribution of employment by broad industrial group in towns near Ringaskiddy (number of persons aged 15 years and over) 2011

	Cobh	Passage West	Crosshaven	Carrigaline
Agriculture, forestry and fishing	18	17	10	34
Mining and quarrying	3	2	1	2
Manufacturing	797	333	104	1,176
Electricity, gas, steam and air conditioning supply	40	30	7	58
Water supply; sewerage, waste management and remediation activities	11	11	9	33
Construction	195	129	55	347
Wholesale and retail trade; repair of motor vehicles and motorcycles	682	348	117	1,006
Transportation and storage	234	86	21	262
Accommodation and food service activities	301	140	36	304
Information and communication	121	97	35	203
Financial and insurance activities	120	86	28	251
Real estate activities	10	20	1	17
Professional, scientific and technical activities	227	156	66	377
Administrative and support service activities	164	103	32	270
Public administration and defence; compulsory social security	535	124	48	348
Education	340	213	85	552
Human health and social work activities	412	253	76	535
Arts, entertainment and recreation	91	36	20	76
Other service activities	135	54	27	146

	Cobh	Passage West	Crosshaven	Carrigaline
Activities of households as employers producing activities of households for own use	5	4	1	10
Activities of extraterritorial organisations and bodies	-	-	1	-
Other Industry	261	75	44	204
Total	4,702	2,317	824	6,211

6.4 Characteristics of Proposed Development in the context of Population and Human Health

The proposed development will consist principally of a waste-to-energy facility (waste incinerator) for the treatment of up to 240,000 tonnes per annum of residual household, commercial and industrial non-hazardous and hazardous waste and the recovery of energy. Of the 240,000 tonnes of waste, up to 24,000 tonnes per annum of suitable hazardous waste will be treated at the facility.

The proposed development will generate additional traffic, and noise and air emissions, which will be within the applicable emission limits. No process or sanitary effluent will be discharged to Cork Harbour. Emissions from the facility are addressed in the relevant sections of the EIS.

Up to 320 people will be directly employed during the construction phase. Up to 63 people will be directly employed during the operational phase.

In addition to the provision of the waste-to-energy facility, the proposed development will include an upgrade of a section of the L2545 road, a connection to the national electrical grid, an increase in ground levels in part of the site, coastal protection measures above the foreshore on Gobby beach and an amenity walkway to the Ringaskiddy Martello tower.

The L2545 upgrade will reduce flood risk on the road which will be of benefit both to the Ringaskiddy Resource Recovery Centre and also to the other existing users of this road including IMERC, NMCI, the crematorium on Rocky Island and the Naval Base on Haulbowline Island. Future development of Haulbowline as a public park will also benefit due to the improved upgrade of the L2545. The increase in ground levels in part of the Indaver site will reduce flood risk.

A new bitumen macadam footpath will be constructed to give access from Gobby Strand to the Martello Tower. It is proposed to run along the eastern edge of the site and will be fenced with a low timber fence along the eastern edge. A viewing area will be provided at the higher south east corner of the site providing expansive views over Cork harbour, Spike Island and Cobh.

Coastal protection in the form of sacrificial material is proposed above the foreshore along the section of Gobby Beach owned by Indaver in order to slow the rate of coastal recession.

It is expected that, if granted planning permission, Indaver would be required to establish a community gain fund to fund environmental and other community

projects and initiatives in the Ringaskiddy area. A payment was a condition of the Port of Cork planning permission.

6.5 Evaluation of Impacts

6.5.1 Introduction

Impacts on humans as a result of the proposed development have been considered in detail in other chapters of this EIS, as follows:

Chapter 5 ***Construction Activities,***

Chapter 7 ***Roads and Traffic,***

Chapter 8 ***Air Quality,***

Chapter 9 ***Climate,***

Chapter 10 ***Noise and Vibration,***

Chapter 11 ***Landscape and Visual,***

Chapter 12 Biodiversity

Chapter 13 Soils, Geology, Hydrogeology, Hydrology & Coastal Recession

Chapter 14 Cultural Heritage

Chapter 15 ***Material Assets.***

The impacts of the proposed development on human beings in relation to health and safety, residential and recreational amenity and economic activities are evaluated in the following sections.

6.5.2 'Do nothing' impacts

Based on past trends and the policies of the *Cork County Development Plan 2014* and the *Carrigaline Electoral Area Local Area Plan 2011*, it can be expected that industrial and port development will continue in the Ringaskiddy area. The Port of Cork expansion project will involve a substantial expansion of Ringaskiddy Port. Residential development in Ringaskiddy and Shanbally villages will be confined to that which is required to meet local needs. Residential and other development will continue in other areas around Cork Harbour, apart from in the coastal areas zoned for protection. Amenity and tourism developments are proposed for Haulbowline and Spike Island, in the vicinity of the proposed Resource Recovery Centre. Further development of the IMERC campus for third level marine and energy research and related uses is planned for the site to the north of the proposed resource recovery centre.

One consequence of this general development will be an intensification of industrial, port and other activity adjacent to Ringaskiddy village, and in the Lower Harbour. This development will take place regardless of whether the proposed resource recovery centre is built or not. As the site of the proposed facility is zoned industrial, it is probable that it would be developed for pharmaceutical or chemical manufacturing, or port use, if the proposed development does not proceed.

If the proposed development did not go ahead, the L2545 road would continue to flood following heavy rainfall because the road drainage is inadequate. In the scenario where the proposed sacrificial beach material was not to be undertaken, coastal recession would continue as it is at present.

6.5.3 Health and Safety

6.5.3.1 Hazard Identification and Risk Assessment Study

Byrne Ó Cléirigh undertook a Hazard Identification and Risk Assessment study which examined the proposed Ringaskiddy resource recovery centre in the context of the Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive, referred to as the Seveso III Directive, and the Chemicals Act (Control Of Major Accident Hazards Involving Dangerous Substances) Regulations, SI 205 of 2015.

The study concluded that the proposed Ringaskiddy Resource Recovery Centre will not be a major accident establishment and that the Seveso III Directive and Regulations will not apply to the centre.

Notwithstanding the fact that the proposed development will not be a major accident establishment, a number of accident scenarios were assessed in the study to determine the risk each posed to human health and the environment. Following industry best practice, five risk ratings of increasing significance, based on the probability of occurrence and the hazard posed, were assigned to the scenarios. The risk ratings were trivial, minor, moderate, substantial and priority. No priority risks were identified and one substantial risk was identified. The substantial risk was a fire in the bunker.

Control measures are proposed as part of the proposed development (Refer to **Chapter 4** ***Description of the Proposed Development*** of this EIS and **Appendix 6.1** ***HAZID*** report). The study concluded that, with the control measures in place, the risks posed to human health and the environment by the facility will be as low as reasonably practical. The report of the Hazard Identification and Risk Assessment is provided in **Appendix 6.1**.

6.5.3.2 Impact on Human Health

EHA undertook an assessment of the potential impacts of the Ringaskiddy Resource Recovery Centre on human health, refer to **Appendix 6.2**.

It has been suggested that emissions from incinerators cause various health effects. There have been extensive studies of the potential health effects of incinerators on human health. EHA undertook a literature review of peer-reviewed research papers reporting these studies.

The review noted that many of the studies on health effects are of historical incinerators which had much higher emissions than the incinerator proposed as part of the resource recovery centre and predate the various EU Directives which have imposed stringent limits on emissions.

The assessment concluded that the evidence is now very strong that well run, modern incinerators have no adverse effect on human health of the communities around them. No adverse human health effects are predicated from the proposed facility. The full assessment is presented in **Appendix 6.2**.

6.5.3.3 Dioxin Uptake AWN

6.5.3.4 General

A soil dioxin and dibenzofuran (PCDD/F) monitoring programme was conducted by AWN Consulting in the Cork Harbour area in 2001 and was repeated in 2008 and in 2015. Dioxin-like polychlorinated biphenols (PCB) were included in the monitoring programme. The full report of the baseline soil monitoring is presented in **Appendix 6.3.**

The dioxin intake model, the RISC Human PCDD/F Intake Model, for the Maximum At Risk Individual (MARI), prepared in 2001/2002 for the original planning application, was updated. The dioxin uptake for the TARI (Typical At Risk Individual) was also predicted.

The impact of PCDD/F emissions from accident scenario was also modelled. The full report is presented in **Appendix 6.4.**

6.5.3.5 Findings of Soil Monitoring

Soil and sediment sampling was conducted at 12 no. locations in the Cork Harbour Area and at EPA Iniscarra, with the aim of determining background concentrations of PCDD, PCDF and dioxin-like PCBs in the vicinity. Refer to Appendix 6.3. Samples were analysed for dioxins and furans with results compared to previous data recorded by AWN and EPA sampling in 2000. The conclusions of the sampling and analysis programme were as follows:

Background concentrations of PCDD/Fs in soil samples were found to be reduced from samples measured at similar locations in 2001 and 2008. The concentration at Martello Tower (Location 3A) continues to be elevated above locations and in this recent round, the total PCDD/F concentration at Roche's Point Lighthouse (Location 7A) was found to be highest with a TEQ of 0.802 ng/kg. Dioxin-like PCB concentrations were typically similar to recorded concentrations in 2008 and remain well below Dutch limit value concentrations.

TEQ PCDD/F concentrations in beach sediment samples were shown to be slightly higher at three out of the four sampling locations in 2015 with the most elevated concentration (0.485 ng/kg) recorded at the strand in Whitegate Village to the east of the site (Beach 1A). PCDD/F concentrations in sediments were still well below EA UK limit values, however.

TOC and pH values were within expected ranges with slight alkalinity in the sediment samples as expected in marine conditions.

Heavy metal concentrations were recorded at each of the twelve locations with highest lead (110 mg/kg) and zinc (140 mg/kg) concentrations recorded at Locations 4A and 2A, respectively.

6.5.3.6 Soil Uptake Modelling Results

Soil sampling and ambient air monitoring data, was used to establish a baseline for PCDD/F (hereafter referred to as 'dioxins and furans') intake for a theoretical Maximum At Risk Individual (MARI) in the vicinity of the proposed Ringaskiddy Waste-to-Energy facility. The report of the soil uptake modelling results is presented in **Appendix 6.4.**

The MARI was assumed to live at the point of maximum dioxin and furan deposition from the proposed development and to be a subsistence farmer, who obtained all their meat, milk and vegetables from a 100m diameter site, upon which the maximum deposition flux impacted.

The annual average dioxin and furan emissions under maximum operating conditions (worst case emissions) and assuming that both municipal solid waste and hazardous waste facilities were operating at maximum permitted dioxin concentration in the flue gas, maximum permitted flue gas exhaust flow rates and maximum throughput, were used to model soil PCDD/F concentrations over the operating life of the facility.

This was a very conservative assumption as it assumed the facility operated 24 hours per day, 365 days per year at the maximum emission concentration and flue gas flow rate.

The modelled soil and air values were then added to the baseline value for dioxin and furans and input to the RISC HUMAN Model.

The predicted increase in dioxin and furan intake for the MARI was estimated to increase by 0.24 pg WHO-TEQ/kg body weight/wk, to 2.26 pg WHO-TEQ/kg body weight/wk, an increase of just 1.7% of the EC TWI limit value of 14 pg WHO-TEQ /kg body weight. The TWI was set by the EU in order to protect human health and was based on applying a safety factor to the LOAEL (Lowest Observed Abnormal Effect Levels) for dioxin and furans.

It was therefore concluded that the predicted impact of the emissions from the waste-to-energy facility, even assuming both municipal solid waste and hazardous waste facilities operating at maximum capacity, maximum permitted exhaust flow rates and maximum permitted dioxin and furan concentrations, in terms of dioxin and furan dose to a theoretical MARI, is not significant, with the dioxin and furan dose to the MARI predicted to increase by only 1.7 % of the limit value. The facility will have no impact on human health with respect to dioxin and furan intake.

6.5.4 Residential Amenity Impacts

6.5.4.1 Traffic Aspects in relation to Residential Amenity

It is clear from the extensive consultations which Indaver has carried out with both the local community and the statutory authorities that traffic congestion on the main N28 approaches to Ringaskiddy and to the site, and how this congestion should be managed during the peak hours, is a major concern. The impact of the generated traffic on the local road network is assessed in **Chapter 7** (***Roads and Traffic***) of this EIS and mitigation measures which Indaver intend to include in their development proposals are investigated where necessary.

With all of the above issues in mind, Indaver has approached the design, construction and operation of the Resource Recovery Centre on the principle of minimising traffic at peak periods where possible.

Construction Phase

Indaver will arrange construction contracts such that all construction travel to and from the site will be controlled and managed and will not be permitted to access the site during the peak traffic periods, except in situations of emergency.

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 and the construction of the upgraded drainage system. The traffic will be diverted onto the temporary road until the upgrade works have been completed.

Operational Phase

Indaver will minimise traffic at peak periods through the implementation of a HGV booking system, and the arrangement of operational personnel shifts and visitor traffic so that the facility generates minimal traffic on the local road network during the peak traffic periods once operational. These initiatives are similar to those developed at the Port of Cork as part of their approach to management of traffic flow at peak times. Furthermore, a robust staff Mobility Management Plan, will ensure that there are no staff movements to or from the facility for two-hour periods in the morning and evening by car, while HGV movements will also be reduced to a minimum level during these times. Further details are provided in **Chapter 7** ***Road and Traffic*** of this EIS.

Indaver is aware of the concern expressed by the community at the consultations in relation to the provision of enhanced active mode travel facilities including improved footpaths, cycle facilities and controlled safe road crossing points. Indaver understands that the local authority are developing proposals for the provision of improved cycle facilities as part of the Cork Cycle Network, improvements to the junction at Shannon Park and also a pedestrian crossing facility in the village of Ringaskiddy.

6.5.4.2 Residential Amenity During Construction – Other Aspects

There may be some minor temporary disruption to the residents in the vicinity of the site due to dust and noise during the construction phase of the proposed resource recovery centre and of the upgrade to the L2545. **Chapters 8** ***Air Quality*****,** and **10** ***Noise and Vibration*** respectively of this EIS have addressed these issues, and the measures, which will be put in place, to minimise this disruption.

6.5.4.3 Residential Amenity During Operation – Other Aspects

The proposed resource recovery centre will not involve any activities or processes completely new to the Ringaskiddy area. The proposed development will be located beside a Hammond Lane which handles scrap steel for recycling.

The off-loading of liquid wastes from tankers in the waste-to-energy facility will be a similar activity and on a similar scale to the off-loading and loading of solvent tankers in the pharmaceutical facilities. In most of these facilities, total waste management is handled by specialist waste contractors and brokerages, for shipment overseas.

Currently, two of the pharmaceutical facilities in the Ringaskiddy area operate incinerators which are licensed by the EPA, and which treat hazardous and non-hazardous waste generated on site. The proposed Waste-to-Energy facility will be larger in scale than the existing incinerators, but will use combustion technology to treat the waste.

The tipping hall and bunker will be under negative pressure to prevent odours from the facility impacting on local residents. There will not be a significant impact from odours resulting from the proposed development.

Trucks carrying solid waste to the facility will be enclosed or covered to prevent litter escaping and the waste tipping floor will be enclosed. Litter will not escape to cause a nuisance to residents.

The ongoing impacts of the operations of the facility due to the traffic generated, emissions to the atmosphere and noise are discussed in **Chapters 7 *Roads and Traffic*, 8 *Air Quality*** and **10 *Noise and Vibration*** of this EIS, respectively. The impact on landscape is assessed in **Chapter 11 *Landscape and Visual Assessment*** of this EIS. There are not expected to be any other impacts on residential amenity.

6.5.4.4 Community Gain Fund

The existing Indaver facility in Meath contributes to a Community Gain Fund as part of the planning conditions of that facility. The Meath fund is administered by the Indaver Community Liaison Committee, which was established in 2009 prior to the construction period.

The Committee in Meath is made up of two representatives from the local residents association, two local area councillors, two members of Indaver and two members of the local authority, who also act as administers of the fund. As part of Indaver's planning conditions, for every tonne of waste that Indaver accepts at the Meath waste-to-energy facility, €1.27 is allocated to the Community Gain Fund which currently amounts to approximately €298,000 per year. In Ringaskiddy, the fund will be more than €300,000 per year for the life of the facility. So far in Meath, the fund has amounted to over €900,000 which has been used to build and light a safe footpath, to finance the construction of a school building, and to support local cultural, community, arts, and sports groups and clubs.

6.5.5 Recreational Amenity Impacts

6.5.5.1 Recreational Amenity During Construction

Access to the recreational amenity of Gobby Beach shoreline and nearby car park will be a temporarily impacted (for approximately 3 weeks) during the placement of sacrificial beach material as part of the coastal defence works. The

sacrificial material consists of imported shingle which will be temporarily deposited on the car park. To ensure the safety of the general public, it is envisaged that the area of the beach, in which the construction works will taking 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. However, access to other sections of the beach will be maintained for the duration of the works.

During construction, the amenity of the L2545 road on the north side of the facility will be reduced due to the road upgrade and road drainage works for up to 12 weeks. The traffic will be diverted onto the temporary road until the L2545 upgrade works have been completed. Of the 12 week duration period, Gobby Beach car park may need to be closed for up to 6 weeks to facilitate the construction works. However, access to the beach will be maintained for the duration of the works.

6.5.5.2 Recreational Amenity During Operation

The operation of the proposed development will not encroach on the shoreline amenity. However, due to the close proximity of the truck traffic on the internal roads of the proposed development and the presence of the large building, the shoreline will be more subject to traffic noise and will have a more industrial ambience than it does currently. Similarly the amenity of the L2545 road on the northern side of the facility will be reduced as the site frontage will have a greater industrial ambience, even with the proposed planting and screening. A public amenity footpath will be provided on the eastern and southern sides of the site, from the boundary near the shoreline to the southern site boundary close to the Martello Tower. There will also be a footpath along the road in the front of the site. The recreational amenity for boat traffic in the West Channel will be slightly reduced as the site will have a more industrial ambience than it has currently.

The impact on landscape is assessed in **Chapter 11 *Landscape and Visual*** of this EIS. There are not expected to be any other impacts on recreational amenity.

6.5.6 Community Facilities

It is expected that some of the 63 direct jobs, and a number of indirect jobs, will be taken up by people moving to live in the area. There will be a consequent slight increase in demand for community facilities. Up to 320 people will be directly employed during the construction phase.

6.5.7 Economic Activity

6.5.7.1 Land Use

The proposed development constitutes a standalone industrial use on a site designated for a standalone industrial development. The proposed development complies with the zoning objective for the site. Adequate landscaped buffers are proposed as appropriate.

Currently most of the site is unused. No economic activity will be displaced by constructing the proposed resource recovery centre on the site.

6.5.7.2 Agriculture

The emissions to atmosphere from the facility, which are detailed in **Chapter 8 *Air Quality*** of this EIS, will be extremely low with no adverse impact on the environment envisaged. In particular, based on the monitoring of emissions from Indaver's Waste-to-Energy facility in Co Meath and its other facilities, the emissions of dioxins will be well below the EU Directive limit. There will be no significant impact on farming activities in the Ringaskiddy area or in the region surrounding the Lower Harbour. In an area, to which incineration is a new activity, there may be a public perception of a risk to human health and a risk of contamination of farm produce from dioxins in the emissions. There is no evidence of food companies or outlets boycotting food produce from locations close to modern incineration facilities, such as the Indaver facility in Co Meath. There have been incinerators in the Ringaskiddy area for many years. The soil dioxin surveys showed that dioxin levels in the soils around the Lower Harbour were below the German target level and well below the level at which crop restrictions would be imposed in Germany. This situation will not change as a result of the operation of the proposed development.

6.5.7.3 Tourism

As set out in Section 6.3.4.1 above, Fáilte Ireland published Guidelines on the treatment of tourism in an Environmental Impact Statement, in 2011

Ringaskiddy is not currently a popular tourist destination, but certain sites of value to local tourism in proximity to the resource recovery centre have been identified as potentially being impacted by the resource recovery centre development. These sites are the Ringaskiddy port, Gobby Beach, the Martello Tower and Spike Island. In accordance with Fáilte Ireland EIS Guidelines the potential impacts of the resource recovery facility have been appraised for these locations.

The potential impacts of the resource recovery centre on the visual, biodiversity and cultural heritage have been appraised in **Chapters 11 *Landscape and Visual Assessment***, **12 *Biodiversity*** and **14 *Archaeological, Architectural & Cultural Heritage*** of this EIS respectively.

Ringaskiddy Port

For tourists using Ringaskiddy Port for the cruise ships or ferry terminal, the resource recovery centre will appear as another industrial facility in the area, refer to **Chapter 11 *Landscape and Visual Assessment***. The potential impacts of the resource recovery facility on the port in relation to traffic has been appraised in **Chapter 7 *Roads and Traffic*** of this EIS.

Gobby Beach

To ensure the safety of the general public, it is envisaged that the area of the beach, in which the construction works will taking 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. However, access to other sections of the beach will be maintained for the duration of the works. The duration of the works is expected to be approximately 3 weeks.

The traffic impacts associated with this construction activity will be minor and are addressed in Chapter 7. In addition, the shingle will be replenished as required in the future but it is unlikely to be required on a frequent basis. 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. Further details are provided in **Chapter 13 *Soils, Geology, Hydrogeology, Hydrology & Coastal Recession*** of this EIS. The impacts experienced for the initial instalment of shingle will be repeated during replenishment.

In addition, during the L2545 works, Gobby Beach car park may need to be closed for up to 6 weeks to facilitate the construction works. However, access to the beach will be maintained for the duration of the works.

L2545

The L2545 upgrade will reduce flood risk on the road which will be of benefit both to the Ringaskiddy Resource Recovery Centre and also to the other existing users of this road including IMERC, NMCI, the crematorium on Rocky Island and the Naval Base on Haulbowline Island. Future development of Haulbowline as a public park will also benefit due to the improved upgrade of the L2545. The proposed landscaping along the L2545 will improve the approach to Gobby Beach.

Martello Tower

A new bitumen macadam footpath will be constructed to give access from Gobby Beach to the Martello Tower. It is proposed to run along the eastern edge of the site and will be fenced with a low timber fence along the eastern edge. A viewing area will be provided at the higher south east corner of the site providing expansive views over Cork harbour, Spike Island and Cobh.

The development has been sensitively designed in relation to the Martello Tower protected structure in order to retain its prominence when viewed from around the harbour. The main process building is situated at a distance from the tower and aligned to have its narrowest part face the tower. The development does not block views of the tower from most viewpoints around the harbour. The building has been set down as far as possible into the ridgeline and appears to be at a similar or lower height than the Martello tower from most viewpoints. The stack does however extend well above the height of the tower although it is set at a distance from it, and the vertical form of the existing wind turbines and electricity pylons rise higher than the tower and are situated directly adjacent to it. Refer to **Chapter 11 *Landscape and Visual Assessment*** for and Chapter **14 *Archaeological, Architectural & Cultural Heritage*** of this EIS further details.

Spike Island

The lower harbour area is currently and will continue to undergo process of change in its visual and landscape character in the short, medium and long term with the other planned and permitted ddevelopments in the area including the DePuy wind turbine at Loughbeg, M28 Cork to Ringaskiddy Motorway Scheme, redevelopment of the Ringaskiddy Port, development of the IMERC campus, Haulbowline and Spike Islands and continued development of other industrial, renewable energy and pharmaceutical projects in the lower harbour area.

The cumulative impact of these developments on the landscape character will be negative in the short term but is deemed to the positive in the medium to long term once operational as the area transitions from a slightly unkempt, semi-industrial area, to a more developed cluster of industry, energy and education campus style landscape. The proposed development will be seen in many ways as an extension of this landscape. Overall the greater surrounding area is deemed capable of absorbing the development without changing the character of the City Harbour Landscape. As such, it is considered that the the Ringaskiddy Resource Recovery Centre is compatible with the plans for greater tourist amenities in the Lower Harbour, such as is envisaged by the Spike Island master plan

6.5.7.4 Construction Phase Economic Impact

The construction of the proposed development will cost circa €160 million. There will be a maximum number of 320 jobs created during construction. There will also be a substantial number of indirect jobs, created in the off-site construction services providers and material suppliers. These jobs will be a beneficial economic impact of the proposed development. In addition, it is envisaged that local shops, pubs and service providers in the area will experience increased trade during the construction phase.

In general, the development will lead to a general increase in economic activity in the area.

6.5.7.5 Operational Phase Economic Benefit

When the proposed development becomes operational, it is anticipated that 63 people will be employed at the facility. It is estimated that the employment provided will contribute positively to the economy of the South Cork area. The proposed resource recovery centre will also generate annual expenditure on maintenance, security, insurance and various other services, which will be from local suppliers where possible. The employees at the facility may frequent the shops and pubs in Ringaskiddy village, thus adding to the general economic activity in the village.

Assuming that Indaver's experience in Meath is indicative, the centre will be a niche point of interest for the area. The Cork facility will attract a specific category of visitors to Ringaskiddy annually. The Meath site attracted visitors even as it was being built. During construction, Indaver provided a visitor room and viewing platform for interest groups and stakeholders. Since the opening of the facility in 2011, visitors have been accommodated in a visitor centre in the main administrative building. To date, more than 2,000 local, national and international visitors have come to the Meath facility. Visitors include local and national secondary schools; Irish and international third-level institutions, specifically from renewable energy, engineering, and sciences fields; local authorities, municipalities, and elected officials from Ireland and abroad; national and international industry groups, Waste-to-Energy operators, and energy bodies; and local, national, and international media including TV, radio, and print journalists. The visitors have come from a range of different countries, including the U.S.A., Belgium, Finland, and the Netherlands. As Indaver is committed to education and research, it is proposed that the facility in Ringaskiddy will have a visitor centre (located in the administration building) similar to the one in Meath. It

will act as a gateway to the site, and will showcase best practice in resource recovery management and sustainability.

6.5.7.6 Shellfish Production, Fishing and Angling

The proposed resource recovery centre will not discharge effluent to Cork Harbour and therefore will not impact on water quality in the designated shellfish growing area.

The upgraded surface water drainage system in the L2545 road will discharge to Cork Harbour via a Class 1 hydrocarbon bypass interceptor and via the existing 450mm surface water outfall at Gobby Beach. There will be no impact on the water quality of Cork Harbour as a result of the road drainage system.

The sacrificial material will be placed above the high tide level and will not impact on water quality.

The proposed development will not have an impact on shellfish production, fishing or angling in Cork Harbour.

6.6 Mitigation Measures

The Health and Safety features incorporated into the design of the proposed facility are outlined in **Chapter 4** ***Description of the Proposed Development*** of this EIS. The Health and Safety policy, procedures and work practices of the proposed development will conform to all relevant health and safety legislation both during the construction and operational stages of the proposed resource recovery centre. The proposed development will be designed and constructed to best industry standards, with an emphasis being placed on the health and safety of employees, local residents and the community at large. The technology to be employed in the proposed development is well understood and has been used successfully in equivalent projects internationally, with no implications for health and safety. The characteristics of the proposed development are presented in **Chapter 4** ***Description of the Proposed Development*** of this EIS and in the drawings submitted with the planning application.

To minimise the risk that the proposed development will cause nuisance, comprehensive mitigation measures will be implemented, during both the construction and operational phases of the development. These mitigation measures will reduce any significant negative impacts of the proposed development on the residential amenity of the local area. Refer to the following EIS Chapters for further details of mitigation measures:

Chapter 5 ***Construction Activities,*** **Chapter 7** ***Roads and Traffic,***

Chapter 8 ***Air Quality,*** **Chapter 9** ***Climate,*** **Chapter 10** ***Noise and Vibration,***

Chapter 11 ***Landscape and Visual, Chapter 12 Biodiversity***

Chapter 13 Soils, Geology, Hydrogeology, Hydrology & Coastal Recession

Chapter 14 Cultural Heritage and **Chapter 15** ***Material Assets.***

6.7 Residual Impacts

The proposed mitigation measures will either avoid, prevent or reduce impacts to human beings during the construction and operation phases of the proposed development. It is considered that there will be a minor residual impact on the recreational amenity of the site and its immediate vicinity as the site will have somewhat more of an industrial character than it does at present. However, the industrial context is in keeping with its location within a Strategic Economic Area and with the predominant zoning of the site as “large stand-alone industry”.

The jobs created during construction and operation, and the contribution which Indaver and its employees will make to the local economy, will have a slight positive economic impact on the Ringaskiddy and Cork City and County areas.

6.8 References

Census of Population. (2002). Retrieved from http://www.cso.ie/en/census/2002censusreports/

Census of Population. (2006). Retrieved from http://www.cso.ie/en/census/census2006reports/

Census of Population. (2011). Retrieved from http://www.cso.ie/en/census/census2006reports/

www.education.ie

Environmental Protection Agency (2003) *Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)* EPA, Wexford

Environmental Protection Agency (2002) *Guidelines on the Information to be contained in Environmental Impact Statements.* EPA, Wexford

Environmental Protection Agency (2015) *Revised Guidelines on the Information to be Contained in Environmental Impact Statements* (draft September 2015); and *Advice Notes for Preparing Environmental Impact Statements* (Draft September 2015)

Fáilte Ireland, (2011) *Guidelines for treatment of tourism in an Environmental Impact Statement*

Pollution Reduction Programme for Shellfish Growing Waters at Cork Great Island North Channel (2010). Retrieved from http://www.environ.ie/en/Publications/Environment/Water/PublicConsultations-ShellfishWatersDirective2/FileDownLoad,22122,en.pdf