STRATEGIC INFRASTRUCTURE DEVELOPMENT

APPLICATION TO AN BORD PLEANÁLA

(REG NO. PL04.PA0045)

ORAL HEARING

RESOURCE RECOVERY CENTRE,
RINGASKIDDY, COUNTY CORK

# WITNESS STATEMENT OF FIONA PATTERSON

## SITE SUITABILITY AND SITE ALTERNATIVES

## 1. Qualifications and Experience

My name is Fiona Patterson. I hold an honours degree (BSc.) Earth Science, University College Cork (1997), a masters degree (M.Sc) Environmental Engineering, Queens University Belfast (1998) and a diploma (DipField Ecol) Field Ecology, University College Cork (2016). I am an Affiliate Member of the Institute of Environmental Management & Assessment (IEMA).

I am a Senior Environmental Scientist with Arup.

Since 2000, I have prepared, or coordinated the preparation of numerous environmental impact statements for a wide range of industrial, infrastructure, institutional, commercial and residential projects.

Arup is a multidisciplinary firm of consulting engineers based in Ireland. Arup prepared the environmental impact statement (EIS) for the Ringaskiddy Resource Recovery Centre.

## 2. Role in the Project

My role in the project was to coordinate the preparation of the EIS. This included the preparation of a site suitability assessment of the Ringaskiddy site in 2015 and site alternatives. My evidence will cover site suitability assessment and site alternatives.

## 2.1 Conclusion of the 2015 Site Suitability Review

- The suitability of the Ringaskiddy site was primarily evaluated against the environmental protection criteria specified in Section 16.5 of the Southern Region Waste Management Plan 2015 – 2021 ("SRWMP"). Refer to Section 3.2.9 of Chapter 3 (*Alternatives*) of the EIS. The conclusions of this evaluation is that the site is suitable for the proposed resource recovery centre.
- A list of technical evaluation criteria was compiled based on a review of various guidance documents. The suitability of the Ringaskiddy site was also evaluated with respect to this list of criteria. Refer to Sections 3.5 to 3.7 of Appendix 3.1 (*Site Evaluation Criteria*) of the EIS. The conclusions of this evaluation is that the site is suitable for the proposed resource recovery centre.
- Since 2000, when the Ringaskiddy site was initially selected, a number of developments have taken place in Ringaskiddy and several more are planned. The implications of these developments for the suitability of the Ringaskiddy site were considered. Refer to Section 3.2.8 of Chapter 3 (*Alternatives*) of the EIS. The conclusions of this evaluation is that the site is suitable for the proposed resource recovery centre.

## 2.2 Alternative Sites

- A site selection study was initially carried out between 1999 and 2000 and included as part of the first planning application submitted in 2001. The 1999 - 2000 site selection process was described in section 2.6 of the *Indaver Ringaskiddy Waste Management Facility EIS (2001).* Section 2.6 of that EIS is reproduced in Section 3.2 of Appendix 3.1 (*Site Evaluation Criteria*) of the Ringaskiddy Resource Recovery EIS (2016).
- The current status of the areas considered during the initial 1999 site selection were reviewed in 2015 to determine if these areas would provide a suitable site for the proposed development now. The conclusion of the review is that Ringaskiddy continues to be the preferred location for the proposed development. Refer to Section 3.3 of Appendix 3.1 of the EIS.
- Lands at Kilbarry, Bottlehill and Gortadroma were not originally included in the initial site selection study in 1999. The suitability of these lands for the proposed development were considered in 2015. Refer to Section 3.2.10 of Chapter 3 (*Alternatives*) of the EIS. The conclusion of the review is that Ringaskiddy is the preferred location for the proposed development.

## 3. Submissions and Responses

In preparing this witness statement, I have considered each of the observations submitted to An Bord Pleanála by various parties in relation to the site suitability considered for the Ringaskiddy Resource Recovery Centre. I have addressed each of them below.

*Issue #1: Clarification on compliance with criteria set out by WHO guidelines on site selection for hazardous waste facilities*

Submission: Numerous submissions

Response

It is assumed that WHO guidelines referred to in the submissions relate to those contained in *Site Selection for new hazardous waste management facilities* (Sloan 1993) published by the World Health Organisation. The site selection process presented in the 1993 WHO guidance was developed for hazardous waste facilities, particularly landfills.

It is noted that as part of the EIS submitted with the second Indaver planning application in 2008, the approach in the WHO guidelines was adopted as a conservative benchmarking tool for the Ringaskiddy site (Refer to Section 3.2.3 *Area Selection Review 2008* of the *Indaver Waste to Energy Facility, Ringaskiddy* EIS (2008)). The conclusion of the 2008 assessment was that the Ringaskiddy site enjoys a favourable rating based upon the WHO Selection Criteria.

The suitability of the Ringaskiddy site proposed for the resource recovery centre satisfies the WHO guidelines in 2016. The WHO process has four steps. The key points emerging from this four step review of the site are set out in **Appendix A** of this document and are summarised below.

**Step 1** is to eliminate generally unsatisfactory areas for hazardous waste sites. The Step 1 assessment shows that the site at Ringaskiddy is not located in an “unsatisfactory” area.

**Step 2** is to highlight promising areas, such as industrial areas, the sites of existing waste management facilities, etc. The Step 2 assessment shows that the Ringaskiddy site is in a promising area. The site ranks highly in three of the four relevant categories, namely industrial areas, sites of existing waste management facilities and location close to waste generators. The site ranks medium against the criterion of roads/highway access.

**Step 3** is the detailed assessment of promising sites. The use of some area types, could normally pose risks to health and the environment, i.e. riverine areas subject to floods, freshwater wetlands, etc. In the Step 3 assessment, the Ringaskiddy site has a low sensitivity in five of the eight relevant categories. It is of medium sensitivity in relation to coastal areas for shellfish and fishing. The site is of high sensitivity in relation to existing developed areas. The site is of high sensitivity due to existing developed areas. The site is located in established industrial part of Ringaskiddy and Ringaskiddy village is located to the

west of the site. Even though the land use zoning is industrial, the landscape is designated as of high value.

**Step 4** is to evaluate and rank sites. This involves the factors affecting health and the environment, such as population density, groundwater and soil characteristics, etc. In the Step 4 criteria, the subject site ranks highly in relation to six out of eight categories relevant to the project. It ranks medium in the two other categories.

Accordingly, the Ringaskiddy site enjoys a favourable rating based upon the WHO Selection Criteria. Refer to **Appendix A** for further details.

**Exclusionary Factors**

Table 2 *Exclusionary factors in site selection* (page 34) contained in *Site Selection for new hazardous waste management facilities* (Sloan 1993) published by the World Health Organisation lists fourteen exclusionary factors which are recommended for consideration during site selection. Exclusionary factors are defined in the WHO document as:

"*areas within which a facility will not be considered. They promote efficiency in the selection process by ruling out inherently unsuitable areas. Since exclusionary criteria preclude development for very general reasons, they must be thoughtfully chosen. The exclusionary factors in Table 2 are recommended for consideration in all cases*".

The fourteen exclusionary factors have been considered for the Ringaskiddy site. This assessment is presented in **Appendix B** of this document. These exclusionary factors do not apply to the Ringaskiddy site. The site is suitable for the proposed resource recovery centre.

*Issue #2: Clarification on siting of a waste management facility in Ringaskiddy which will service up to eight counties*

Submission: Numerous submissions

Response

**Municipal Waste**

- There is a need for municipal waste treatment infrastructure of in the Connacht/Ulster and Southern region. The Eastern and Midlands region is already catered for. The need for treatment of MSW in the Southern Region is considerably larger than in the Connacht/Ulster region due to the larger population. Refer to Section 3.2.3 of Chapter 3 (*Alternatives*) of the EIS. Refer also to the Chapter 2 (*Planning*) of the EIS for details on the Southern Region Waste Management Plan,
- Cork City and County is the most populous area in the Southern Region with over half a million in 2011. Refer to Table 3.2 of Section 3.2.3 of Chapter 3 (*Alternatives*) of the EIS which shows that Cork City and County has the highest population outside of Dublin and is furthest away from infrastructural interference. This is the area where the largest concentration of Municipal Solid Waste is produced. Therefore it is appropriate to locate the proposed development in County Cork.
- Within Cork City and County, the greatest concentration of the population, and the focus for strategic planning, is the Metropolitan Cork Area. The population of the Metropolitan Cork area, including Cork City, was 289,739 people at 2011, or 56% of the total population of the City and County. Ringaskiddy is located in Metropolitian Cork.

**Industrial and Hazardous Waste**

- The proposed facility will treat both hazardous and non-hazardous waste, a combination current policy recognises as reasonable.
- As noted in Section 3.2.3 of Chapter 3 (*Alternatives*) of the EIS, there were 110,809 employees in Cork City and County in 2012, while by comparison Limerick City and County had only 34,9816, which suggests a greater level of industry in Cork City and County, and by extension, a greater production of industrial waste.
- Ringaskiddy is strategically located in close proximity to a number of urban centres, industrial waste producers and a Port of National Significance (Tier 1).
- Cork is a hub for the pharmaceutical industry. Little Island and Ringaskiddy itself are home to a cluster of multinational pharmaceutical companies, the producers of the hazardous and non-hazardous industrial waste that the proposed waste-to-energy facility would treat. There is also potential for commercial synergies with other, non-pharmaceutical local businesses.
- The total amount of D10 (Incineration) hazardous waste exported in 2012 was 39,612 tonnes (Source: National Waste Report 2012). This figure has increased to 76,229 tonnes in 2013 and 60,252 tonnes in 2014 (Source: National Transfrontier

Shipment figures for D10 (incineration)). It is expected that the 2015 figure will be in line with the 2013 and 2014 figures.

- Of the 39,612 tonnes D10 hazardous waste exported in 2012, 29,674 tonnes could be treated in the proposed development in Ringaskiddy. Refer to the Table below.

| | |
|---|---|
| Industrial | 9393 |
| Paint & Ink | 4165 |
| Aqueous | 6684 |
| Solid Waste | 4469 |
| Sludges | 1676 |
| Packaging | 819 |
| Absorbents | 1315 |
| Oil Filters | 720 |
| Oil Sludges | 433 |
| **Total** | **29,674** |

- In 2015, Indaver exported 24,469 tonnes of D10 hazardous waste to its own facilities in Belgium and Germany. Of the 24,469 tonnes exported, 17,772 tonnes (72.6%) was sourced from the Cork region.

**Proposed and Potential Energy Production**

- The proposed development will treat both waste and produce energy. A suitable connection point into the national grid will be provided at Loughbeg station which is located adjacent to the Ringaskiddy site. Refer to Section 3.2.4 of Chapter 3 (*Alternatives*) of the EIS.
- There are a number of significant industrial facilities, which have large and constant process heat requirements, located within 3 km of the Ringaskiddy site. This gives rise to the potential for the waste-to-energy facility to provide steam or hot water to those heat users in the future should a heat distribution network be developed. Flexibility has been built into the design of the proposed development to facilitiate its operation both heat and electricity production if it became possible to progress with the heating supply network. Refer to Section 3.2.5 of Chapter 3 (*Alternatives*) of the EIS.

In conclusion, the proximity principle underpins Indaver's choice of a site in Ringaskiddy, as it is located near sources of hazardous and non-hazardous municipal and industrial waste.

*Issue #3: Consideration of Alternative sites*

Submission: Numerous submissions

Response

The 1999-2000 study examined five areas around Cork Harbour and identified industrial zoned land. The current status of these areas was reviewed in 2015 and is addressed in Section 3.3 of Appendix 3.1 (*Site Evaluation*) of the EIS. The conclusion of the review in 2015 of the areas in County Cork, considered in the original site selection study, is that Ringaskiddy is the preferred location for the Resource Recovery Centre.

Lands at Kilbarry, Bottlehill and Gortadroma were not originally included in the initial site selection study in 1999. The suitability of these lands for the proposed development were considered in 2015. Refer to Section 3.2.10 of Chapter 3 (*Alternatives*) of the EIS. The main reasons why Ringaskiddy is preferred over these three sites are summarised as follows:

Ringaskiddy is preferred over **Bottlehill** for the following reasons

- The Ringaskiddy site is closer to the main producers of the hazardous waste and non-hazardous industrial waste streams than Bottlehill
- There are no potential users of heat in the vicinity of the Bottlehill site (refer to attached Figure).
- Ringaskiddy is located in an Industrial Area designated as Strategic Employment Area

Ringaskiddy is preferred over **Gortadroma** for the following reasons:

- The Ringaskiddy site is closer to the main producers of the hazardous waste and non-hazardous industrial waste streams than Gortadroma.
- Gortadroma is a significant distance from the large population of Cork city.
- There are no potential users of heat in the vicinity of the Gortadroma site.

Ringaskiddy is preferred over **Kilbarry** for the following reasons:

- The land located in an Industrial area designated as Strategic Employment Area is owned by the IDA and is not available for purchase for infrastructure.
- There are no major potential users of heat in the vicinity of the Kilbarry site.
- Poor road network in Kilbarry

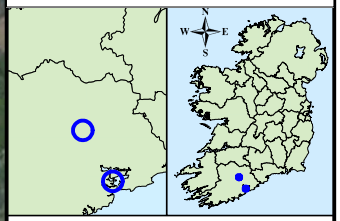
## 4. Conclusion

The site is suitable for the proposed development.




## LEGEND

- Site Location
- Site Location Buffer 5km
- Building Location




**Client**

Indaver Ireland

**Project**

**Energy Offtake Comparison**

**Title**

# Ringaskiddy Waste Management Facility

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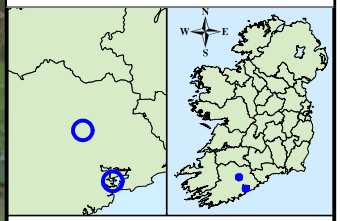
| Issue Details | | | |
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| Drawn by: | D. Ferguson | Project No. | MDR0961 |
| Checked by: | I. MacHugh | File Ref. | MDR0961MI0012D02 |
| Approved by: | Jim Gannon | | |
| Scale: | 1 : 47,890 @ A4 | Drawing No. | Rev. |
| Date: | 06/07/2015 | MDR0961MI0013/12 | F01 |

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## LEGEND

- Site Location
- Site Location Buffer 5km
- Building Location




**Client**

Indaver Ireland

**Project**

**Energy Offtake Comparison**

**Title**

**Bottlehill Landfill**

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## APPENDIX A

## FOUR STEP ASSESSMENT OF SUITABILITY OF RINGASKIDDY RESOURCE RECOVERY CENTRE AGAINST WORLD HEALTH ORGANISATION GUIDELINES

The WHO process has four steps. The key points emerging from this four step review of the site are set out below.

**Table 3.2 - Step 1** is to eliminate generally unsatisfactory areas for hazardous waste sites. The Step 1 assessment shows that the site at Ringaskiddy is not located in an "unsatisfactory" area.

| Assessment Criteria | Applicability of Criteria | Sensitivity of Site | Comment |
|---|---|---|---|
| Coastal areas subject to floods | Yes | Low | A detailed flood risk assessment of the development has been prepared. A very small area along the northern boundary of the site is subject to pluvial flooding. The key facilities will be set at a level well above the flood level.<br>Refer to Chapter 13 (*Soils, Geology, Hydrogeology, Hydrology & Coastal Recession*) and Appendix 13.4 (*Flood Risk Assessment*) of the EIS. |
| Coastal wetlands | No | N/A | Wetlands are areas that are waterlogged for an extended period of time and include habitats such as swamps and marshes.<br>The site is not located in a coastal wetland. Not relevant to this site.<br>Refer to Chapter 13 (*Soils, Geology, Hydrogeology, Hydrology and Coastal Recession*) of the EIS. |
| Areas with limestone deposits | No | N/A | The site is not located in an area with limestone deposits. Not relevant to this site.<br>Refer to Chapter 13 (*Soils, Geology, Hydrogeology, Hydrology & Coastal Recession*) of the EIS |
| Areas with subsurface mining | No | N/A | The site is not located in an area with subsurface mining. Not relevant to this site.<br>Refer to Chapter 13 (*Soils, Geology, Hydrogeology, Hydrology & Coastal Recession*) |
| Areas critical for aquifer recharge. Areas including an aquifer that is the sole source of water for human consumption. Areas of reservoir watersheds.<br>Areas of high well | No | N/A | The site is not located in areas critical for aquifer recharge, is not located in an aquifer that is the sole source of water for human consumption and is not located in an area of reservoir watersheds. Site is not located in an area of high well yield<br>Not relevant to this site<br>Refer to Chapter 13 (*Soils, Geology, Hydrogeology, Hydrology and Coastal Recession*) of the EIS. |

| Assessment Criteria | Applicability of Criteria | Sensitivity of Site | Comment |
|---|---|---|---|
| yield | | | |
| Lands designated for preservation | No | N/A | The site is not designated. Not relevant to this site.<br>Site is 0.5km from SPA and 300m from pNHA.<br>Refer to Chapter 12 (*Biodiversity*) of EIS and 2016 Natura Impact Statement. |

**Table 3.2 - Step 2** is to highlight promising areas, such as industrial areas, the sites of existing waste management facilities, etc. These factors are related primarily to community development.

| Assessment Criteria | Applicability of Criteria | Ranking of Site | Comment |
|---|---|---|---|
| Industrial areas | Yes | High | Criteria applicable. Site located in industrially zoned area.<br>Refer to Chapter 2 (*Policy & Planning Framework and Need for Scheme*) of 2016 EIS. Refer also to Planning Report (2016) |
| Sites of existing waste management facilities | Yes | High | Criteria applicable. Selected site is adjacent to a ferrous metal recycling business.<br>Refer to Chapter 1 (*Introduction*) of EIS |
| Compatible public lands | No | N/A | Criteria not applicable |
| Abandoned properties | No | N/A | Criteria not applicable |
| Lands with major highway access | Yes | Medium | Criteria applicable.<br>Good road access, currently. The N28 has adequate capacity apart from commuter peak hours. Mitigation measures have been incorporated to minimise traffic during peak hours. Refer to Chapter 7 (*Roads and Traffic*) of the EIS. |
| Lands near waste generators | Yes | High | Criteria applicable.<br>Site located close to generators of hazardous, industrial and municipal waste. Refer to Chapter 2 (*Policy & Planning Framework and Need for Scheme*) of EIS. |

The Step 2 assessment showed that the Ringaskiddy site is in a promising area. The site ranks highly in three of the four relevant categories, namely industrial areas, sites of existing waste management facilities and location close to waste generators. The site ranks medium against the criterion of roads/highway access.

**Table 3.3 - Step 3** is the detailed assessment of promising sites. The use of the type of area, listed below, would normally pose risks to health and the environment, i.e. riverine areas subject to floods, freshwater wetlands, etc.

| Assessment Criteria | Applicability of Criteria | Sensitivity of Site | Comments |
|---|---|---|---|
| Riverine areas subject to floods | Yes | Low | Criteria applicable.<br>Site is not located in a riverine area prone to fluvial flooding,<br>A detailed flood risk assessment of the development has been prepared. A very small area along the northern boundary of the site is subject to pluvial (rainfall) flooding. The key facilities will be set at a level well above the flood level.<br>Refer to Chapter 13 (*Soils, Geology, Hydrogeology, Hydrology & Coastal Recession*) and Appendix 13.4 (*Flood Risk Assessment*) of the EIS. |
| Freshwater wetlands | No | N/A | Criteria not applicable.<br>Site not located in area with freshwater wetlands<br>Refer to Chapter 13 (*Soils, Geology, Hydrogeology, Hydrology & Coastal Recession*) and Chapter 12 (*Biodiversity*) of EIS |
| Areas with flood hazards relating to a dam | No | N/A | Criteria not applicable<br>Site not located in area with flood hazard relating to a dam |
| Coastal areas for shellfish and fishing | Yes | Medium | Criteria applicable<br>Site located adjacent to coastal areas. There are shellfish farm leases on the eastern side of the Harbour, approx 5km from the site. Process effluent will not be generated. Mitigation measures have been incorporated into design to minimise impacts on groundwater and surface water.<br>Refer to Chapter 13 (*Soils, Geology, Hydrogeology, Hydrology & Coastal Recession*), Chapter 12 (*Biodiversity*) and Chapter 6 (*Population and Human Health*) of the EIS. |
| Areas upstream of water supply intakes | No | N/A | Criteria not applicable.<br>The site is not located in an area upstream of water supply intakes<br>Refer to Chapter 13 (*Soils, Geology, Hydrogeology, Hydrology & Coastal Recession*) of the EIS. |
| Areas with subsurface mining | No | N/A | Criteria not applicable.<br>The site is not located in an area with subsurface mining. |

| | | | |
|---|---|---|---|
| | | | Refer to Chapter 13 (*Soils, Geology, Hydrogeology, Hydrology & Coastal Recession*) of the EIS. |
| Assessment of characteristics of soil and groundwater | Yes | Low | Criteria applicable<br>Arup's geotechnical engineers have determined that the soils on the site are suitable for the proposed development. The site is not an area of groundwater recharge, is not an area with outcrops of aquifers of significant or potential use, considering water availability and regional use.<br>Refer to Chapter 13 (*Soils, Geology, Hydrogeology, Hydrology and Coastal Recession*) of the EIS. |
| Areas of special significance | Yes | Low | Criteria applicable.<br>Site 0.5km distance from SPA and 300m from pNHA. Refer to Chapter 12 (*Biodiversity*) of EIS and 2016 Natura Impact Statement |
| Visual corridors of scenic rivers | Yes | High | Criteria applicable.<br>The site is located in a High Value Landscape area (Cork County Development Plan (CDP) 2014). Site is also located in an industrial area which is zoned as a strategic employment area.<br>The visual and landscape impact of the proposed development has been assessed and appropriate mitigation has been incorporated into the overall design and site landscaping to reduce the visual impact on receiving environment.<br>Refer to Chapter 11 (*Landscape and Visual*) of the EIS. |
| Existing developed areas | Yes | High | Criteria applicable.<br>Site located in established industrial part of Ringaskiddy. Ringaskiddy village is located to the west of the site. Refer to Chapter 2 (*Policy & Planning Framework and Need for Scheme*) of the EIS. Refer also to Planning Report (2016) |
| Areas for which non industrial development is planned | Yes | Low | Criteria applicable.<br>Site is zoned industrial. Non industrial development existing and planned to the north of the site (NMCI, IMERC campus and Spike and Haulbowline Islands). Refer to Chapter 2 (*Policy & Planning Framework and Need for Scheme*) of EIS. Refer also to Planning Report (2016) |
| Agricultural districts | Yes | Low | Criteria applicable<br>Site located in established industrial part of Ringaskiddy.<br>Refer to Chapter 2 (*Policy & Planning Framework and Need for Scheme*) of EIS |

In the Step 3 assessment, the Ringaskiddy site has a low sensitivity in five of the eight relevant categories. It is of medium sensitivity in relation to coastal areas for shellfish and fishing. The site is of high sensitivity due to existing developed areas. The site is located in established industrial part of Ringaskiddy and Ringaskiddy village is located to the west of the site. Even though the land use zoning is industrial, the landscape is designated as of high value.

**Table 3.4 - Step 4** is to evaluate and rank sites. This involves the factors affecting health and the environment, such as population density, groundwater and soil characteristics, etc.

| Assessment Criteria | Applicability of Criteria | Ranking of Site | Comments |
|---|---|---|---|
| Population Density* | Yes | High | Criteria applicable.<br>Site located 16 km from Cork City |
| Response time of emergency services | Yes | Medium | Criteria applicable<br>Site located within established industrial area |
| Critical habitats or potential mineral developments | Yes | High | Criteria applicable<br>No mineral potential.<br>Site 0.5km from SPA and 300m from pNHA (refer to Chapter 12) |
| Groundwater and soil characteristics | Yes | High | Criteria applicable<br>Arup's geotechnical engineers have determined that the soils on the site are suitable for the proposed development. The site is not an area of groundwater recharge, is not an area with outcrops of aquifers of significant or potential use, considering water availability and regional use.<br>Refer to Chapter 13 (*Soils, Geology, Hydrogeology, Hydrology & Coastal Recession*) of the EIS. |
| Slope | No | N/A | Criteria not applicable.<br>These criteria are mainly applicable to landfill sites. Not relevant to this development.<br>Arup's geotechnical engineers have determined that the soils on the site are suitable for the proposed development.<br>Refer to Chapter 13 (*Soils, Geology, Hydrogeology, Hydrology & Coastal Recession*) of EIS |
| Access to sewers | N/A | Medium | No process effluent will be generated. Storm water sewer will discharge to Local Authority sewer on L2545. Sanitary wastewater will be treated on site and pumped to Irish Water foul sewer east of Ringaskiddy village. Refer to Chapter 15 (Material |

| | | | |
|---|---|---|---|
| | | | Assets) of the EIS. |
| Transport restrictions | Yes | High | Criteria applicable<br>No transport restrictions |
| Structures along transport corridors | Yes | High | Criteria applicable<br>No structures which restrict HGV weight or height |
| Whether the area contains historic sites | Yes | High | Criteria applicable<br>There is a Martello Tower 70m from the site boundary. Refer to Chapters 11 (*Landscape & Visual*) and 14 (*Cultural Heritage*) of the EIS. |
| Feasibility of acquisition | Yes | N/A | Criteria applicable<br>The site has been acquired. |

*Proximity to population dwellings – The WHO guidelines state that the site scores a **negative** rating if there are more than 15 dwelling units within 500 feet (150m) of the proposed site boundary, **neutral** rating if there are 5-15 dwellings within 500 feet, or **positive** rating if there are fewer than 5 units within 500 feet. There are less than 5 units within 150m of the site of the waste to energy facility at Ringaskiddy, therefore the site stores a **positive** rating according to the WHO guidelines.

In the Step 4 criteria, the subject site ranks highly in relation to six out of eight categories relevant to the project. It ranks medium in the two other categories.

Accordingly, the Ringaskiddy site enjoys a favourable rating based upon the WHO Selection Criteria.

## APPENDIX B

## Assessment of site against exclusionary factors listed in Table 2 of WHO guidelines

| | Exclusionary factors in site selection | Comments |
|---|---|---|
| 1 | Unstable or weak soils, such as organic soil, soft clay or clay-sand mixtures, clays that lose strength with compaction, clays with a shrink-swell character, sands subject to subsidence and hydraulic influence, and soils that lose strength with wetting or shock. | The site does not have unstable or weak soils.<br>Arup's geotechnical engineers have determined that the soils on the site are suitable for the proposed development.<br>Refer to Chapter 13 (*Soils, Geology, Hydrogeology, Hydrology and Coastal Recession*) of the EIS. |
| 2 | Subsidence owing to solution – prone subsurfaces, subsurface mines (for coal, salt and sulphur) and water, oil or gas withdrawl | The site is not located in an area which has subsidence owing to solution.<br>Arup's geotechnical engineers have determined that the soils on the site are suitable for the proposed development.<br>Refer to Chapter 13 (*Soils, Geology, Hydrogeology, Hydrology and Coastal Recession*) of the EIS. |
| 3 | Saturated soils, as found in coastal or riverine wetlands | The site is not located in saturated soils as found in coastal or riverine wetlands. Wetlands are areas that are waterlogged for an extended period of time and include habitats such as swamps and marshes.<br>Arup's geotechnical engineers have determined that the soils on the site are suitable for the proposed development.<br>Refer to Chapter 13 (*Soils, Geology, Hydrogeology, Hydrology and Coastal Recession*) of the EIS. |
| 4 | Groundwater recharge, as in areas with outcrops of aquifers of significant or potential use, considering water availability and regional geology | The site is not an area of groundwater recharge, is not an area with outcrops of aquifers of significant or potential use, considering water availability and regional use.<br>Refer to Chapter 13 (*Soils, Geology, Hydrogeology, Hydrology and Coastal Recession*) of the EIS. |
| 5 | Flooding, as in flood plains or hydraulic encroachment, coastal or riverine areas with a history of flooding every 100 years or less, and areas susceptible to stream-channel or storm encroachment (even if not | A detailed flood risk assessment of the development has been prepared. A very small area along the northern boundary of the site is subject to pluvial flooding. The key facilities will be set at a level well above the flood |

| | Exclusionary factors in site selection | Comments |
|---|---|---|
| | historically subject to flooding) | level.<br><br>Refer to Chapter 13 (*Soils, Geology, Hydrogeology, Hydrology & Coastal Recession*) and Appendix 13.4 (*Flood Risk Assessment*) of the EIS. |
| 6 | Surface water, which preclude sites above an existing reservoir or a location designated as a future reservoir, or above an intake for water used for human or animal consumption or agriculture and within a distance that does not permit response to a spill based on high-flow (most rapid) time of travel | The site is not above an existing or future reservoir or water intake.<br>Refer to Chapter 13 (*Soils, Geology, Hydrogeology, Hydrology and Coastal Recession*) of the EIS. |
| 7 | Atmospheric conditions, such as inversions or other conditions that would prevent the safe dispersal of an accidental release | Dr Edward Porter has reviewed the atmospheric conditions at the site and advised that, from an air dispersion modelling perspective the region would not be considered to be prone to inversion conditions.<br><br>Refer to Chapter 8 (*Air Quality*) of the EIS. |
| 8 | Major natural hazards, such as volcanic action, seismic disturbance and landslides | The site is not subject to major natural hazards, such as volcanic action, seismic disturbance and landslides.<br><br>Refer to Chapter 13 (*Soils, Geology, Hydrogeology, Hydrology and Coastal Recession*) of the EIS. |
| 9 | Natural resources, such as the habitats of endangered species, existing or designated parks, forests and natural or wilderness areas | The site does not contain natural resources, such as the habitats of endangered species, existing or designated parks, forests and natural or wilderness areas. Site is 0.5km from SPA and 300m from pNHA.<br><br>Refer to Chapter 12 (*Biodiversity*) of EIS and 2016 Natura Impact Statement. |
| 10 | Agricultural or forest land of economic or cultural importance | The site does not contain agricultural or forest land of economic or cultural importance. The site is zoned industrial. |
| 11 | Historic locations or structures, locations of archaeological significance and locations or land revered in various traditions | The site does not contain historic locations or structures, locations of archaeological significance and locations or land revered in various |

| | Exclusionary factors in site selection | Comments |
|---|---|---|
| | | traditions. A Martello tower is located 70m from the site. Refer to Chapters 11 (*Landscape & Visual*) and 14 (*Cultural Heritage*) of the EIS. |
| 12 | Sensitive installations, such as those storing flammable or explosive materials, and airports | The Hazard Identification and Risk Assessment report, provided in Appendix 6.1 of the EIS, addressed potential hazardous in the vicinity of the Indaver site. In compliance with the HSA's land use planning guidelines, 'Sensitive installations such as those storing flammable or explosive materials' are considered to be facilities to which the SI 209 of 2015, Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (Seveso 3 regulations), apply. There is no such facility in close proximity to the site. |
| 13 | Stationary populations, such as those of hospitals and correctional institutions | There are no hospitals or correctional institutions located near the site. There is a primary school located to the south west of Ringaskiddy Village. This is at a distance of more than 500m of the site. The National Maritime College of Ireland, Beaufort building and future iMERC campus are located to the north of the site. These are third level non-residential colleges and the staff and students are not considered to be stationary. |
| 14 | Inequity, resulting from an imbalance of unwanted facilities of unrelated function or from damage to a distinctive and irreplaceable culture or to people's unique ties to a place | The development of this site will not result in inequity. The site is zoned in the County Development Plan for the proposed use. Ringaskiddy has been designated as an industrial area for since the 1970s. The need for the facility is identified in the Regional Waste Plan.<br><br>Refer to Chapter 2 (*Policy & Planning Framework and Need for Scheme*) of 2016 EIS.<br><br>No distinctive or irreplaceable culture or people's unique ties to a place will be affected by the development on the site. |