18 Interactions

18 INTERACTIONS 1

18.1 INTRODUCTION 2
18.2 DESCRIPTIONS OF INTERACTIONS AND THEIR SIGNIFICANCE 2
18.3 CONCLUSION 8

18.1 Introduction

This Chapter was prepared by Brock McClure, Planning and Development Consultants, in conjunction with the other appointed consultants who assisted in preparation of this EIAR. The purpose of this chapter is to identify and draw attention to significant interactions between environmental factors.

Impact interactions and inter-relationships have been considered throughout the environmental assessment process and in the preparation of individual, topic specific chapters of this EIAR in order to facilitate a holistic assessment of how the proposed scheme may affect various environmental factors. All environmental topics are interlinked to a degree, and this chapter contains an analysis of the interrelationships between specific environmental influences.

As referenced throughout this EIAR, criteria for evaluating impact levels and definitions of the magnitude of any effects follow the EPA '*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*" (Draft 2017) guidance and Government of Ireland '*Guidelines for Planning Authorities and An Bord Pleanala on carrying out Environmental Impact Assessment'(2018)*. The magnitude of effects considers the likely scale of the predicted change to the baseline conditions resulting from the predicted effect, taking into account the duration of the effect i.e. temporary or permanent. Moreover, as set out in the European Commission's, *Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report* (2017), reference should also be made to the earlier (1999) European Commission's, *Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions*.

18.2 Descriptions of Interactions and their Significance

Population & Human Health

The individual EIAR chapters have addressed the interactions with population and these can be summarised as follows:

Water: Potential impacts on the receiving water environment could also result in associated human health impacts. However, the mitigation measures described in Chapter 4- Population and Human Health, and those relevant in Chapter 7 – Hydrology will ensure that this will not occur

Air Quality and Climate: Potential impacts on the receiving air quality and climate environment could also result in associated human health impacts. However, the mitigation measures described in Chapter 4 – Population and Human Health, and those relevant in Chapter 9 – air quality and climate will ensure that this will not occur.

Noise and Vibration: Construction phase noise and vibration emissions will be temporary and transient and will be managed so as to minimise impact to population and human health by complying with all relevant guidance, as such the impact will be short-term and have a slight impact overall. Potential impacts on the receiving noise and vibration environment could also result in associated human health impacts. However, the mitigation measures described in Chapter 4 – Population and Human Health, and Chapter 8 – Noise and Vibrations will ensure that this will not occur.

Lands, Soils, Geology & Utility – Potential impacts on the receiving land, soils and geology environment could also result in human health impacts. However, the mitigation measures described on Chapter 4 – Population and Human Health, and those relevant in Chapter 6 – Land, Soil, Geology, Hydrogeology & Utility will ensure that this will not occur.

18.2.2 Biodiversity

Risks to Biodiversity have been considered by each discipline of the EIAR. The following disciplines have potential for significant interaction with Biodiversity:

Landscape and Visual – The biodiversity of the receiving environment has informed the landscape design associated with the proposed development. Potential impacts on the receiving landscape could also result in associated biodiversity impacts. However the mitigation measures described in Chapter 5 – biodiversity, and those relevant in Chapter 11 -Landscape and Visual Impact Assessment will ensure that this does not occur.

Air Quality and climate – Potential impacts on the receiving air quality and climate environment could also result in associated biodiversity impacts. However, the mitigation measures described in Chapter 5 – Biodiversity, and those relevant in chapter 9 – Air Quality and climate, will ensure that this will not occur.

Noise and Vibration – Potential impacts on the receiving noise and vibration environment could also result in associated biodiversity impacts. However, the mitigation measures described in Chapter 5 – Biodiversity, and those relevant in Chapter 8 – Noise and Vibration, will ensure that this will not occur.

Water: The key environmental interaction with Biodiversity is Hydrology Chapter 7 of this EIAR document which proposes measures to ensure the quality (pollution and sedimentation) and quantity (surface run-off and flooding) is of an appropriate standard. Mitigation measures described in Chapter 5 – Biodiversity, and those relevant in Chapter 7 – Hydrology will ensure that this will not occur.

18.2.3 Land, Soils, Geology, Hydrogeology and Utilities

During the construction phase, the following aspects would interact with land and soils and in the absence of mitigation may give rise to likely significant effects:

- **Hydrology** – As outlined in the receiving environment, there is an inter-relationship between hydrology and soils, geology and hydrogeology. Surface water run-off may have the potential to enter soil and shallow groundwater. Implementation of appropriate mitigation measures as outlined in the CEMP will eliminate the potential for the influx of surface contaminants into the underlying geology and hydrogeology which would otherwise affect its quality:

    - Control of Water Pollution from construction Sites, Guidance for consultants and contractors (C532); and
    - Guidelines on Protection of Fisheries During Construction Works in and
    - Adjacent to Waters (2016).
    - Environmental Good Practice on Site (3rd edition) (C692).

    Surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete. A temporary drainage system shall be installed prior to the commencement of the construction works to collect surface water runoff by the site during construction.

    It is envisaged that a number of geotextile lined settling basins or a proprietary silt collector and temporary mounding's and/or silt fences will be installed to ensure silts do not flow off site during the construction stage. This temporary surface water management facility will throttle runoff and allow suspended solids to be settled out and removed. All inlets to the settling basins will be 'riprapped' to prevent scour and erosion in the vicinity of the inlet.

- **Air Quality** – There is a potential for soil excavation activity to impact on air quality in terms of dust generated but the implementation of suitable mitigation will ensure a neutral impact, mitigation measures are set out in the CEMP:

  Site Management:
  - Complaint registers will be kept detailing all telephone calls and letters of complaint received in connection with construction activities, together with details of any remedial actions carried out;
  - Equipment and vehicles used on site will be in good condition such that emissions from diesel engines etc. are not excessive; and
  - Pre-start checks will be carried out on equipment to ensure they are operating efficiently and that emission controls installed as part of the equipment are functional.

  Dust deposition levels will be monitored on a regular basis in order to assess the impact that site activities may have on the local ambient air quality. The following procedure will be implemented:
  - The dust deposition rate will be measured by positioning Bergerhoff Dust Deposit Gauges at strategic locations near the boundaries of the site for a period of 30 (+/- 2) days if required. Monitoring should be conducted as required during periods when the highest levels of dust are expected to be generated i.e., during site preparation works and soil stripping activities.
  - The exact locations will be determined after consideration of the requirements of Method VDI 2119 with respect to the location of the samplers relative to obstructions, height above ground and sample collection and analysis procedures.
  - After each 30 (+/- 2 days) exposure period, the gauges will be removed from the sampling location, sealed and the dust deposits in each gauge will be determined gravimetrically by an accredited laboratory and expressed as a dust deposition rate in mg/m2/day in accordance with the relevant standards.
  - Technical monitoring reports detailing all measurement results, methodologies and assessment of results shall be subsequently prepared and maintained by the Site Manager.

- **Dust Control Measures** - The aim is to ensure good site management by avoiding dust becoming airborne at source. This will be done through good design, planning and effective control strategies. The siting of construction activities and the limiting of stockpiling will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance. In addition, good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or using effective control measures quickly before the potential for nuisance occurs.

  • During working hours, technical staff will be available to monitor dust levels as appropriate; and
  • At all times, the dust management procedures put in place will be strictly monitored and assessed.

- **Waste** – There is a requirement to dispose of soil excavated on the site and other waste building materials. Appropriate sampling and disposal will be undertaken as outlined in the outline CEMP.

  In the event that Asbestos containing materials (ACMs) are found, the removal will only be carried out by a suitably permitted waste contractor, in accordance with S.I. No. 386 of

2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006 - 2010. All asbestos will be taken to a suitably licensed or permitted facility.

In the event that hazardous soil, or historically deposited waste is encountered during the construction phase, the contractor will notify Dún Laoghaire-Rathdown County Council (DLRCC) and provide a Hazardous/Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant mitigation, destination for disposal/treatment, in addition to information on the authorised waste collector(s).

- **Electrical Supply** – All works shall be varied out in accordance with ESB code of Practice for electrical infrastructure. Laying of cables and testing of same will be in accordance with ESB standard details. The works shall be inspected in an ongoing basis daily during construction by both the applicant's engineers and ESB site Engineer. Applicable testing shall be carried out prior to connection to the electrical grid.
- **Gas** – All works shall be carried out with GNI code of Practice for gas infrastructure. Laying of gas main and testing of same will be in accordance with GNI's standard details, the works shall be inspected on an ongoing basis during construction by both the applicant's engineers and the GNI's Area Engineer. Applicable testing shall be carried out prior to connection to the public network.
- **Telecommunication** – All works shall be carried out in accordance with the relevant telecoms providers' code of Practice. Laying of ducts and cables and testing of same will be in accordance with their standard details. The works shall be inspected on an ongoing basis during construction by both the applicant's engineers and relevant communication provider. Applicable testing shall be carried out prior to connection to the network.

18.2.4 Noise & Vibration

In compiling this environmental impact assessment, reference has been made to the project description provided by the project co-ordinators, project drawings provided by the project architects and information relating to construction activities provided by the engineers. Noise emission sources from the proposed development during the construction and operational phases will be from construction plant and activity, building services and traffic accessing the development. The noise impact assessment has been prepared in consultation with the design team and traffic engineers. Reference can be made to the relevant chapters for additional information.

Population and Human Health – There is an interaction with Human Health, which has informed Chapter 4 of this EIAR.

Traffic – There is an interaction with Traffic, which has informed Chapter 12 – Traffic and transport, of this EIAR.

18.2.5 Air Quality and Climate

Air quality does not have a significant number of interactions with other topics. The most significant interactions are between population and human health and air quality. An adverse impact due to air quality in either the demolition, construction or operational phase has the potential to cause health and dust nuisance issues. The mitigation measures that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits and therefore the predicted impact is short-term, imperceptible, and negative with respect to population and human health during construction and long-term, imperceptible and neutral during operation phase.

Interactions between air quality and traffic (Chapter 12) can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase.

The impacts of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the impact of the interactions between traffic and air quality are considered to be long-term, imperceptible, and neutral.

Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between air quality and land and soils in the form of dust emissions. With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between air quality and land and soils.

As set out in Chapter 6 (Land, Soils, Geology, Hydrogeology & Utilities), dust generation can occur during extended dry weather periods as a result of construction traffic. Dust suppression measures (e.g., dampening down) will be implemented as necessary during dry periods and vehicle wheel washes will be installed. The works involve stripping of topsoil and excavations, which will remove some vegetation such as trees and scrub. It will also generate dust and potentially impact on the air quality in the locality. However, the generation of dust will be temporary during construction phase and is not anticipated to have a significant impact on biodiversity.

The impact of the interactions between land, soils and geology, biodiversity and air quality are considered to be short-term, imperceptible, and neutral.

No other significant interactions with air quality and climate have been identified.

18.2.6 Wind and Microclimate

Risks to Wind and Microclimate have been considered by each discipline of the EIAR. The following disciplines have potential for significant interaction with Wind and Microclimate:

Landscape & Visual Impact Assessment: The interactions between the proposed development and landscaping is fundamental to mitigate the unwanted impact of wind. Landscaping has reduced and re-directed the flow velocity of the incoming wind in the areas that were found to be critical.

Cultural Heritage: The existing environment and proposed development will receive prevailing winds from South-West and South-East. As discussed in the previous sections and demonstrated through this assessment of CFD modelling, all adverse wind impacts have been considered and shown to be suitable to its intended use. The existing site cumulative assessment has accounted for the modelling and simulation of all the topography and existing developments in the surrounding as the presence of adjacent buildings dictates how the wind will approach the proposed development.

From the wind modelling results, it is predicted that the proposed development will introduce no negative wind effects on adjacent, nearby or future developments within its vicinity.

18.2.7 Material Assets – Traffic and Transport

Risks to Traffic and Transport have been considered by each discipline of the EIAR. The following disciplines have potential for significant interaction with Traffic and Transport:

Population & Human Health: Temporary negative impacts to human health may be likely during the Construction Phase due to noise, dust, air quality and visual impacts which are discussed in the relevant chapters of this EIAR.

Noise & Vibration: Temporary negative impacts to human health may be likely during the Construction Phase due to noise, dust, air quality and visual impacts which are discussed in the relevant chapters of this EIAR.

Air Quality & Climate: Temporary negative impacts to human health may be likely during the Construction Phase due to noise, dust, air quality and visual impacts which are discussed in the relevant chapters of this EIAR.

Landscape and Visual Impacts: Temporary negative impacts to human health may be likely during the Construction Phase due to noise, dust, air quality and visual impacts which are discussed in the relevant chapters of this EIAR.

Material Utilities - Utilities: In addition, temporary traffic management will be required to facilitate connections to existing utilities in the existing roads.

18.2.8 Material Assets - Waste Management

Risks to Waste Management have been considered by each discipline of the EIAR. The following disciplines have potential for significant interaction with Waste Management:

Land & Soils: During the Construction Phase excavated topsoil, made ground, fill, sub-soil and clay (c. 45,000m^3) will be generated from the excavations required to facilitate site levelling, construction of the basements and construction of new foundations. It is estimated that all or most of the c. 45,000m^3 of excavated material will need to be removed off-site, with only 1,500m^3 remaining for reuse. Where material has to be taken off-site it will be taken for reuse or recovery, where practical, with disposal as last resort. Adherence to the mitigation measures in Chapter 13 and the requirements of the C&D WMP, will ensure the effect is *long-term*, *imperceptible* and *neutral.*

Traffic & Transportation: Local traffic and transportation will be impacted by the additional vehicle movements generated by removal of waste from the Site during the Construction and Operational Phases of the proposed Project. The increase in vehicle movements as a result of waste generated during the Construction Phase will be *temporary* in duration. There will be an increase in vehicle movements in the area as a result of waste collections during the Operational Phase but these movement will be imperceptible in the context of the overall traffic and transportation increase and has been addressed in Chapter 12 (Traffic and Transport). The mitigation measures detailed in Chapter 12, and the requirements of the OWMP (included as Appendix A13.2) are adhered to, the effects should be *short to long-term, imperceptible* and *neutral*.

Population & Human Health: The potential impacts on human beings in relation to the generation of waste during the Construction and Operational Phases are that incorrect management of waste could result in littering which could cause a nuisance to the public and attract vermin. A carefully planned approach to waste management and adherence to the project specific C&D WMP and OWMP, will ensure appropriate management of waste and avoid any negative impacts on the local population. The effects should be *long-term*, *imperceptible* and *neutral.*

18.2.9 Archaeological, & Cultural Heritage

There are potential interactions with the following specialist elements of the project during the construction phase:

- Land, Soils, Geology, Hydrogeology and Utilities (Chapter 6)
- Landscape and Visual Impact Assessment (Chapter 11)
- Architectural and Built Heritage (Chapter 15)

18.2.10 Architectural and Built Heritage

There were interactions between Architectural Heritage and Architectural Design

- *Develop design to comply with heritage protection guidelines;*
- *maximise retention of historic fabric;*
- *retain character of structure and those elements which give special interest*
- *ensure reversibility of interventions*

- **Arboriculture** - *Retain significant trees which give site its sylvan character.*

- **Landscape design** - *Develop Landscape design with reference to historic site plan and historic landscape assessment.*

- **Archaeological Heritage** - *Research Archaeology of site and develop design to respond.*

- **Historic Landscape Assessment** - *Research Historic Landscape is almost entirely associated with development of Protected Structures.*

- **Visual Impact Assessment** - *Assess Views to and from Protected Structures.*

18.2.11 Daylight and Sunlight

The interactions between the proposed development and its environs and human health have been evaluated within the assessment. The modelling has included the proposed design and existing adjacent buildings which will remain. The combination of all interactions has resulted in excellent daylight and sunlight access to the proposed development with no significant impacts to surrounding existing buildings.

18.12 Conclusion

A summary of the interactions is summarised in the table below.

Interaction	pulation and Human Heal		Biodiversity		Land, Soils, Geology & Utilities		Water		Noise & vibrations		Air Quality & Climate		Wind & Microclimate		Landscape & visual Impact Assessment		Material Assets - Traffic & Transport		Material Assets - Waste Management		Archaeological and Cultural Heritage		Architectural and Built Heritage		Daylight and Sunlight	
	Constructio	Operationa	Constructio	Operationa	Constructio	Operationa	Constructio	Operationa	Constructio	Operationa	Constructio	Operationa	Constructio	Operationa	Constructio	Operationa	Constructio	Operationa	Constructio	Operationa	Constructio	Operationa	Constructio	Operationa	Constructio	Operationa
Population and Human Health			x	x	✓	x	✓	x	✓	✓	✓	✓	x	x	x	x	x	x	y	y	x	x	x	x	✓	✓
Biodiversity					✓	✓	✓	✓	✓	✓	✓	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Land, Soils, Geology & Utilities							✓	✓	x	x	✓	✓	x	x	x	x	✓	✓	✓	✓	✓	✓	x	x	x	x
Water									x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Noise & vibrations											x	x	x	x	x	x	✓	✓	x	x	x	x	x	x	x	x
Air Quality & Climate													x	x	x	x	✓	✓	x	x	x	x	x	x	x	x
Wind & Microclimate															✓	✓	x	x	x	x	✓	✓	x	x	x	x
Landscape & visual Impact Assessment																	x	x	x	x	✓	✓	✓	✓	x	x
Material Assets - Traffic & Transport																			x	x	x	x	x	x	x	x
Material Assets - Waste Management																					x	x	x	x	x	x
Archaeological and Cultural Heritage																							x	x	x	x
Architectural and Built Heritage																									x	x
Daylight and Sunlight																										