

Chapter 8

Lands and Soils

8.0 LAND AND SOILS

8.1 INTRODUCTION

This chapter of the EIAR was prepared by Ben Mong CEng, MEI, Associate civils with DBFL Consulting Engineers and was reviewed by Laura McLoughlin BEng (Hons), CEng, MEI, Associate Civils with DBFL Consulting Engineers. Ben has over 10 years' experience in large scale civils engineering design projects with extensive experience in Roads & Drainage, Water & Wastewater and Bulk Earthworks for Commercial, Industrial and Residential developments. Laura has over 10 years' experience working in civil engineering consultancies managing projects from inception to handover under the NI Framework for Small Sewerage Schemes, infrastructure design and drainage sustainability in residential and commercial developments.

This Chapter of the EIAR comprised of an assessment of the likely impact of the proposed development on the land, soils and geology as well as identifying proposed mitigation measures to minimise any likely significant effects identified.

8.2 STUDY METHODOLOGY

Assessment of the likely impact of the proposed development on land, soils and geology included the following activities:

- Preliminary Ground Investigation Study.
- Review of information available on the Geological Survey of Ireland (GSI) online mapping service.
- Geological Survey of Ireland – Geological and Groundwater Databases (www.gsi.ie).
- Bedrock Geology 1:100,000 Scale Map Series, Sheet 7 (Geology of Sligo - Leitrim). Geological Survey of Ireland (GSI, 1996).
- Geological Survey of Ireland – 1:25,000 Field Mapping Sheets.
- Review of information available on the Environmental Protection Agency (EPA) online mapping service.
- General Soil Map of Ireland 2nd edition (www.epa.ie).

Preliminary Ground Investigations for the proposed development were carried out by Ground Investigations Ireland (GII) and concluded in July 2020 and included the following scope of work:

- Visit to the project site to observe existing conditions.
- 13 No. Trial Pits to a maximum depth of 4.0m below ground level (BGL).
- 5 No. Soakaways to determine a soil infiltration value to BRE Digest 365.
- 25 No. Dynamic Probes to determine soil strength/density characteristics.
- 8 No. Cable Percussion boreholes to a maximum depth of 7.10m BGL.
- 5 No. Rotary boreholes to a maximum of 17.20m BGL.
- Geotechnical & Environmental Laboratory testing.
- Report with recommendations.

Refer to the Ground Investigation Report (GII, Issue Date July 2020, report no. 9225-11-19) and Waste Classification & Groundwater Assessment Report (GII, Issue Date June 2020, report no. 9225-11-19), both included as part of this application under separate cover.

8.3 THE EXISTING AND RECEIVING ENVIRONMENT

8.3.1 Soils

The site lands are currently agricultural and considered as a greenfield site.

Review of information available on the GSI's online mapping service ("Quaternary Sediments") indicate that the site is underlain predominantly by a sediment type described as "GLPSsS – Gravels derived from Lower Palaeozoic sandstones and shales". Refer to Figure 8.1 below.

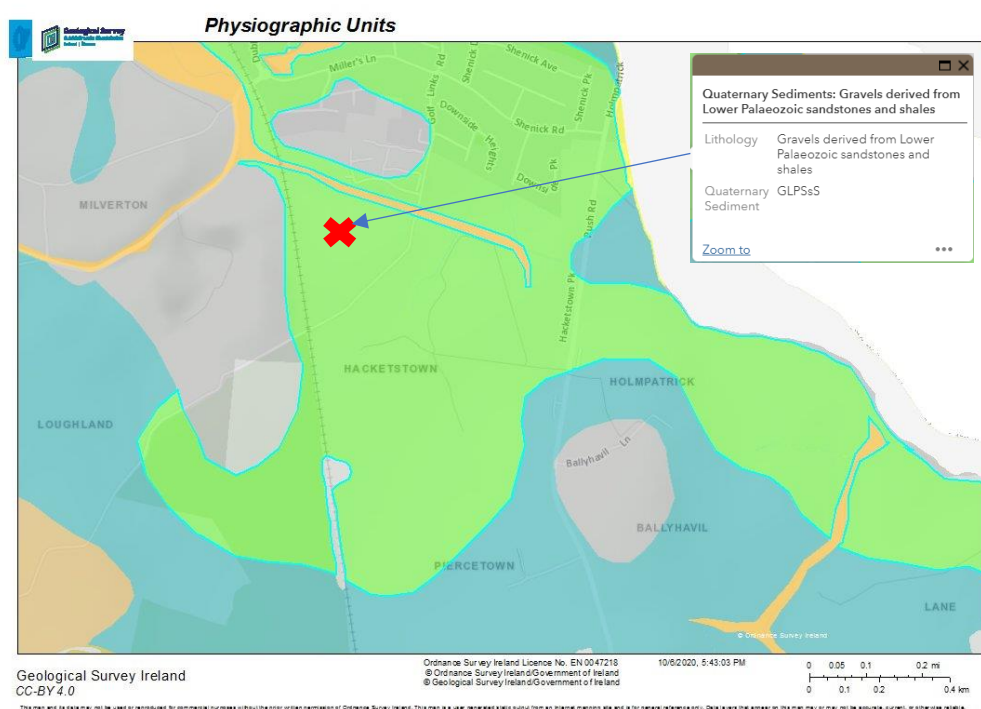


Figure 8.1 Extract from Quaternary Sediments Map (source GSI Online Mapping Service)

Ground conditions at the site, as observed during Preliminary Ground Investigations, are summarized as follows:

- Topsoil to a maximum depth of 0.5m.
- Made Ground, not prominent, however encountered in TPI17 and TP10 to a maximum depth of 1m BGL described as brown slightly sandy slightly gravelly with occasional cobbles.
- Cohesive deposits were encountered beneath topsoil and described typically as brown sandy gravelly clay/silty clay with occasional cobbles and boulders.
- Granular deposits were encountered within the cohesive deposits and described as grey and brown clayey sandy sub rounded to sub angular fine to coarse gravel or gravelly fine to coarse sand.
- The rotary boreholes recovered medium strong to strong grey fine-grained limestone. The depth to medium strong to strong limestone rock varies from 9.8m BGL to 13.2m BGL. Possible weathered rock was encountered at a depth of 14.6m BGL.

Groundwater levels were generally high towards the northern portions of the site. Groundwater observations vary between 1.0m BGL and 1.5m BGL.

Infiltration tests were carried out at five locations. Tests results indicated infiltration rates (f) to be partial to none. An infiltration rate of 8.2×10^{-6} m/s was calculated for the soakaway at location TPI16. These results reflect Low Permeability to impermeable soils.

Geotechnical, chemical and environmental tests were carried out in the IGSL laboratory and results were as follows:

- The pH and sulphate testing carried out indicated the PH results to be near neutral and that the water soluble sulphate results were low when compared to the guideline values from BRE Special Digest 1:2005. The samples tested classify the soil as a Design Sulphate Level DS-1.
- Based on the results of the HazWasteOnLine™ tool the material sampled across the site can be classified as non-hazardous.
- Therefore the site soils can be considered to be not contaminated. There are no known areas of soil contamination present in the study area.
- The most applicable waste category for each of the samples has been presented in Table 3 of the Waste Classification & Groundwater Assessment Report (GII, Issue Date June 2020, report no. 9225-11-19).
- The S4UL Assessment concluded that the material analysed is suitable for retention on site post development.

8.3.2 Geology

A review of GSI's online mapping service ("Bedrock Geology") describes geology in the vicinity of the site as "Visean Limestone & calcareous shale".

GSI have classified the site's groundwater vulnerability as "high".

GSI have also classified the underlying bedrock aquifer as a "locally important aquifer - karstified".

There are no designated sites of geological heritage within the proposed site boundary.

8.3.3 Radon

A review of the EPA's online mapping service ("Radon Map") shows that less than one percent of the homes in this 10km grid square are estimated to be above the reference level of 200 becquerel per cubic metre (Bq/m³). Refer to Figure 8.2 below.

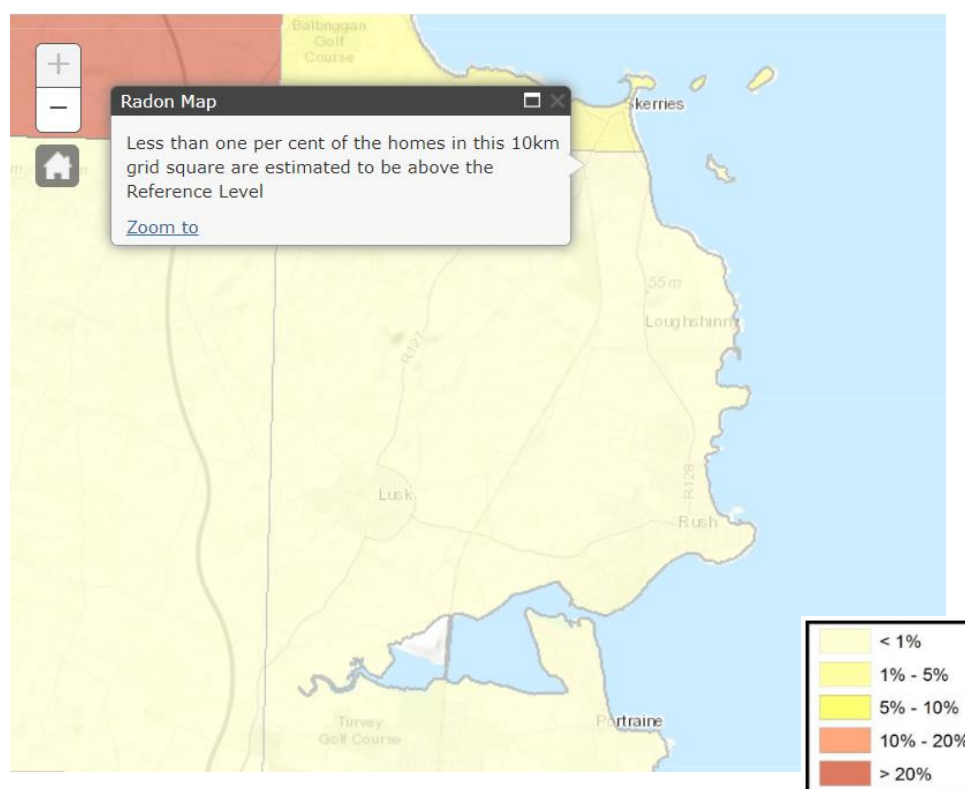


Figure 8.2 Extract from EPA Mapping Service (Radon Mapping)

8.4 CHARACTERISTICS OF THE PROJECT

The proposed development entails a Strategic Housing Development comprising 345 no. residential units, childcare facility, vehicular access, pedestrian and cycle infrastructure, and all associated site development and infrastructural works, on a site of 6.7ha. zoned for residential use the Fingal County Development Plan 2017-2023. This is the 'project' to be assessed in the EIAR.

Project Description

The development entails 345 no. residential units comprising of 84 no. 1-bed units, 104 no. 2-bed units (68 no. 2-bed apartments and 36 no. 2-bed duplexes), 157 no. 3-bed units (118 no. 3-bed duplexes and 39 no. 3 - bed houses) ranging in height from 2 no. – 4 no. storeys on a site of 6.7 ha. located at Hacketstown in the townlands of Milverton, Townparks and Hacketstown, Skerries, Co. Dublin. The subject lands are accessed via Golf Links Road to the south and Ballygossan Park Phase 1 to the north. The development entails 345 no. residential units comprising of 84 no. 1-bed units, 93 no. 2-bed units (66 no. 2-bed apartments and 27 no. 2-bed duplexes), 167 no. 3-bed units (128 no. 3-bed duplexes and 39 no. 3 - bed houses) ranging in height from 2 no. – 4 no. storeys on a site of 6.7 ha. located at Hacketstown in the townlands of Milverton, Townparks and Hacketstown, Skerries, Co. Dublin.

The proposed development is set out in 8 blocks which comprise the following:

- Block A1 comprises 39 No. units at 4 storeys in height (Comprising a mix of 26 No. apartments & 13 No. Duplexes)
- Block A2 comprises 33 No. units at 4 storeys in height (Comprising a mix of 22 No. apartments & 11 No. Duplexes)
- Block B1 comprises 16 No. units at 3 storeys in height (Comprising all 3 bed Duplexes)
- Block B2 comprises 16 No. units at 3 storeys in height (Comprising all 3 bed Duplexes)
- Block C comprises 42 No. units at 2-3 storeys in height (Comprising 15 No. apartments & 27 No. Duplexes)
- Block D comprises 32 No. units at 2-3 storeys in height (Comprising 12 No. apartments and 20 No. houses)
- Block E comprises 62 No. units at 2-3 storeys in height (Comprising 38 No. apartments & 24 No. Duplexes)
- Block F comprises 66 No. units at 2-3 storeys in height (Comprising 39 No. apartments & 27 No. Duplexes)
- Block G comprises 25 No units at 2-3 storeys in height. (Comprising 20 No. Duplexes and 5 No. houses)
- Block H comprises 14 No units at 2-3 storeys in height. (Comprising 14 No. houses)
- Public Open Space of c.16,670 sqm (25% of net developable area) is proposed including the parkland and main public square, in addition to the linear park of c.2,427 sqm;
- c.2,272 sqm communal open space is proposed to serve the apartments;
- 414 car parking spaces in total are proposed including 40 visitor spaces, 3 for creche set down and 2 for creche staff parking within undercroft and at surface level.
- 802 No. bicycle parking spaces comprising including 128 No. visitor spaces and 10 No. to serve the creche;
- Childcare and community facility of c.377 sqm. located in Block C;
- Upgrades to the Golf Links Road including new pedestrian and cycle infrastructure with frontage on Golf Links Road;
- Vehicular access off the Golf Links Road is to be provided to the south east of the subject site;
- In addition the proposal will provide a new internal link road. This internal link road will connect to the adjacent lands to the north, for which a separate planning application has been made to Fingal County Council under Reg. Ref. F21A/0287 (ABP Reg. Ref. 312189-21);

All associated site development and infrastructural works including amenity spaces, landscaping, open space, boundary treatments, vehicular parking, bicycle parking, utilities, internal roads, footpaths and shared surfaces, playground, site clearance and temporary construction development.

The proposed development will require alteration of ground levels.

Excavation of soil and subsoil, as well as existing made ground will be required for the proposed development in preparation of a suitable sub-formation for road construction, trenching for foul and surface water infrastructure and other services.

The project, which is the subject of assessment in this EIAR and the accompanying Appropriate Assessment Report and Natura Impact Statement, will be facilitated by advance infrastructural works. These works were the subject of a Section 34 application to Fingal County Council (FCC F21A/0287) and are currently on appeal to An Bord Pleanála (ABP Reg. Ref. 312189). They consist of a connecting road to the north, drainage infrastructure, cycle and pedestrian facilities, and associated landscaping (the “AI Works”). The Project, is assessed to ensure that all cumulative and in combination effects of the Project with other plans and projects within the zone of influence, including the Advance Infrastructure Works (Ref. ABP-312189-21), the prior application for off-site road improvements serving the wider area (ABP Reg. Ref. 309409; FCC Reg. Ref. F20A/0324), and the proposals by Noonan Construction for Ballygossan Park Phase 2 have been fully assessed in order to enable the competent authority to undertake a lawful environmental impact assessment (“EIA”), appropriate assessment screening (“AA Screening”) and appropriate assessment (“AA”).



Figure 8.3: Site Location with approximate SHD site outlined in red and approximate Advanced infrastructure application outlined in Blue (Source: Google Maps, 2022).

Details of proposed site services are outlined in Chapter 13 – Material Assets – Site Services.

8.4.1 Foul Drainage

As noted above, an Advanced Infrastructure Application (AI) was recently submitted to Fingal County Council under planning reference number F21A/0287. This application made provision for the foul sewer network infrastructure, located within the AI development boundary, required to facilitate this proposed development and its connection to the existing public foul sewer infrastructure.

This development is proposed to connect to the 225mm dia foul sewer to be installed as part of the AI submission. It is proposed that this development will be serviced internally by 150mm and 225mm diameter foul sewers and will include the provision of services connections, inspection chambers etc. throughout the site.

8.4.2 Water Supply

During the construction of the adjacent Ballygossan Park Phase 2 development, a 150mm diameter watermain was installed up to the boundary of the subject site, to facilitate future development.

As part of the AI submission mentioned above, provision was made for the extension of this 150mm diameter watermain i.e a spur was left for the currently proposed development.

The subject development will utilise this connection as main supply.

It is proposed that this development will be serviced by 150mm and 100mm diameter watermains and will include the provision of new fire hydrants and relevant infrastructure throughout the site.

8.4.3 Surface Water Drainage

In order to facilitate the surface water run off generated by the future development of the Hackettstown Lands (LAP), as well suitably intercept, treat and attenuate surface water in accordance with the relevant guidelines and legislation, partial provision of surface water networks and connections for this development was made as part of the AI works made under planning reference number FCC Reg. Ref. F21A/0287; ABP Ref. ABP-312189-21. This includes the complete construction of the Regional Drainage Facility (RDF). Please see Chapters 1 and 2 of this EIAR for full project details.

Surface water run-off from the proposed development will be discharged after attenuation within the Regional Drainage Facility, to the existing public surface water network to the east of the Hackettstown Lands via a headwall structure and outlet constructed as part of the Ballygossan Park Phase 2 development.

8.5 POTENTIAL LIKELY SIGNIFICANT EFFECTS OF THE PROJECT

8.5.1 Construction Phase

8.5.1.1 Stripping of Topsoil

Removal of the existing topsoil layer will be required. It is expected that all stripped topsoil will be reused on site.

Stripping of topsoil will result in exposure of the underlying subsoil layers to the effects of weather and construction traffic and may result in subsoil erosion and generation of sediment laden runoff.

	Volume (m ³)
Topsoil Strip (150mm thick layer)	10 702
Topsoil Reuse (over same)	10 702

Table 8.1 Preliminary Estimated Topsoil Volumes (+/- 10%)

8.5.1.2 Excavation of Subsoil Layers

Excavation of existing subsoil layers will be required in order to allow road construction, drainage and utility installation and provision of attenuation of surface water.

Underlying subsoil layers are brown sandy gravelly Clay or silty Clay with occasional cobbles and boulders and are expected to be generally suitable for reuse as non-structural fill (e.g. build-up of back gardens areas or build-up of open spaces).

	Volume (m ³)
Cut (excavation of subsoil layers as described in 8.5.1.2 above)	20 386
Reuse of Excavated Material as Non Structural Fill	10 523

Table 8.2 Excavation of Subsoil / Reuse of Excavated Material (+/- 10%)

8.5.1.3 Imported Fill

In the context of materials imported to site, these will be natural stones sourced from locally available quarries, greenfield / inert soil imported as materials that have been determined as by-products in accordance with the EPA's criteria for determining a material is a by-product or not a waste, per the provisions of articles 27(1) or 28 of the European Communities (Waste Directive) Regulations, 2011-20, or under a Waste Permit issued by the local authority, where required.

Imported materials will be granular in nature and used in the construction of road pavement foundations, drainage and utility bedding and surrounds. Imported fill will also be required for the raising of the site levels for the construction of the Link Road to underside of formation level.

Materials will be brought to site and placed in their final position in the shortest possible time. Any imported material will be kept separate from the indigenous arisings from the site. All excavation to accommodate imported material will be precisely co-ordinated to ensure no surplus material is brought to site beyond the engineering requirement.

This EIAR considers the works associated with this development. The cumulative effects of the proposed Advanced Infrastructure Application, and adjacent site development will be considered as integrated. The volume/material requirements to construct the Regional Drainage Facility is considered also. It is envisaged that a minimal volume of material will be imported to make up the volume of fill required, but instead fill required will be taken from the bulk digs and excavations on the adjacent sites. By employing as many by-products from these adjacent sites as possible the carbon footprint will be minimised and Circular Economy requirements complied with.

	Volume (m ³)
Fill (Total)	25 706
Reuse of Excavated Material (Non Structural Fill)	10 523
Topsoil Reuse (landscaping of open spaces etc.)	10 702

Table 8.3 Imported Fill (+/- 10%)

8.5.1.4 Construction Traffic

Earthwork's plant (e.g. dump trucks) and vehicles delivering construction materials to site (e.g. road aggregates, deliveries etc.) have potential to cause rutting and deterioration of the topsoil layer and any exposed subsoil layers, resulting in erosion and generation of sediment laden runoff. This issue can be particularly noticeable at site access points (resulting in deposition of mud and soil on the surrounding road network). Dust generation can also occur during extended dry weather periods as a result of construction traffic.

8.5.1.5 Accidental Spills and Leaks

During the construction phase there is a risk of accidental pollution from the sources noted below. Accidental spills and leaks may result in contamination of the soils underlying the site.

- Storage of oils and fuels on site.
- Oils and fuels leaking from construction machinery.
- Spillage during refuelling and maintenance of construction machinery.
- Use of cement and concrete during construction works.

8.5.1.6 Geological Environment

Any excavations associated with development of the site are expected to be relatively shallow and are not expected to impact on the underlying geology.

At present it is envisaged that precast driven piles will be used in the construction of a number of the dwellings which will result in displacement of soil in-situ as opposed to generating any spoil. This will have a negligible effect on the geological environment. For the larger structures, continuous flight auger (CFA) or bored displacement piles are likely to be used. These will generate spoil.

It is not expected that piling will be required for all structures across the site, due to the varying geotechnical profile of the underlying soils. Traditional strip foundations will be employed where piling is not necessary.

8.6 DO NOTHING IMPACT

Should the development not proceed the site would remain in its current state with the impact to likely have Neutral and Imperceptible effects on the environment.

8.7 REMEDIAL AND MITIGATION MEASURES

8.7.1 Construction Phase

Construction will result in land take of approximately 4.8 hectares of agricultural land and the design levels will tie in with the surround topology.

8.7.1.1 Stripping of Topsoil

Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development. At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas.

Topsoil stockpiles will be protected for the duration of the works and not located in areas where any sediment laden runoff may enter existing surface water drains.

Topsoil stockpiles will also be located so as not to necessitate double handling.

Surface water runoff from areas stripped of topsoil will be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate.

On-site settlement ponds will be installed and will include geotextile liners and riprapped inlets and outlets to prevent scour and erosion.

8.7.1.2 Excavation of Subsoil Layers

Excavation of existing subsoil layers has been minimised by designing the proposed road and finished floor levels as close to the original topography as possible. Cut type earthworks operations will not be required to achieve designed site levels.

Disturbed subsoil layers will be stabilized as soon as practicable (e.g. backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping). The duration that subsoil layers are exposed is to be minimised in order to mitigate against weather effects.

Similar to the comments regarding stripped topsoil, stockpiles of excavated subsoil material will be protected for the duration of the works. Stockpiles of subsoil material will be located separately from topsoil stockpiles.

Measures will be implemented to capture and treat sediment laden surface water runoff (e.g. sediment retention ponds, surface water inlet protection and earth bunding adjacent to open drainage ditches).

8.7.1.3 Imported Fill

As noted in section 8.5.1.3 above, importation of fill to site will be required.

No large or long-term stockpiles of fill material will be held on the site. At any time, the extent of fill material held on site will be limited to that needed in the immediate vicinity of the active work area.

Smaller stockpiles of fill, where required, will be suitably protected to ensure no sediment laden runoff enters existing surface water drains. Such stockpiles are to be located in order to avoid double handling.

8.7.1.4 Construction Traffic

Plant and vehicles delivering construction materials to site will be confined to predetermined haul routes around the site.

Vehicle wheel wash facilities will be installed in the vicinity of any site entrances and road sweeping implemented as necessary in order to maintain the road network in the immediate vicinity of the site.

Dust suppression measures (e.g. dampening down) will be implemented as necessary during dry periods.

8.7.1.5 Accidental Spills and Leaks

In order to mitigate against spillages contaminating underlying soils, all oils, fuels, paints and other chemicals will be stored in a secure bunded hardstanding area.

Refuelling and servicing of construction machinery will take place in a designated hardstanding area which will also be remote from any surface water inlets (when not possible to carry out such activities off site).

Oil, fuel etc. storage areas will be decommissioned on completion of the construction phase. Any remaining liquids will be removed from site by an appropriately authorised collector and disposed of at an appropriate authorised facility.

8.7.1.6 Geological Environment

No mitigation measures are proposed in relation to the geological environment as they are not necessary. There are no geological heritage or designated sites within the proposed development boundary.

8.7.2 Operational Phase

On completion of the construction phase no mitigation measures are proposed as there will be no likely significant effect on land, soils and geology.

8.8 POST MITIGATION RESIDUAL EFFECTS OF THE PROJECT

8.8.1 Construction Phase

Implementation of the measures outlined in Section 8.7.1 will ensure that the potential impacts of the proposed development on land, soils and geology do not occur during the construction phase and that any residual impacts will be short term / imperceptible.

8.8.2 Operational Phase

There are no predicted impacts arising from the operational phase. Accordingly the predicted likely significant effects will be long-term-imperceptible i.e. neutral.

The potential likely and significant impact on hydrogeology during the construction phase is considered to be short term, temporary and moderate without mitigation measures in place. On completion of the construction phase, it is not envisaged that there would be a further direct impact on the soil or geology structure. Ensuring appropriately designed and constructed site services will protect the soils and geology from future contamination arising from operation of the developments. The impacts on soils and geology arising from the operational phase will be temporary and imperceptible

8.9 MONITORING

Proposed monitoring during the construction phase in relation to the soil and geological environment is as follows:

- Adherence to Outline Construction Management Plan.
- Construction monitoring of the works (e.g. inspection of existing ground conditions on completion of cut to road formation level in advance of placing capping material, stability of excavations etc.).
- Inspection of fuel / oil storage areas.
- Monitoring cleanliness of adjacent road network, implementation of dust suppression and provision of vehicle wheel wash facilities.
- Monitoring of contractor's stockpile management (e.g. protection of excavated material to be reused as fill, protection of soils for removal from site from contamination).
- Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.)

No ongoing monitoring is proposed on completion of the construction phase.

8.10 REINSTATEMENT

All temporary construction compounds and site entrances will be removed upon completion of the construction phase. Such areas will be reinstated in accordance with the landscape architect's plan and engineer's drawings.

All construction waste and / or scrapped building materials are to be removed from site on completion of the construction phase and disposed of at an appropriately authorised facility.

Oil, fuel etc. storage areas will be decommissioned on completion of the construction phase. Any remaining liquids will be removed from site and disposed of at an appropriate authorised facility.

All sediment control measures (e.g. sediment retention ponds) are to be decommissioned on completion of the construction phase. Such areas will be reinstated in accordance with the landscape architect's plan and engineer's drawings.

8.11 INTERACTIONS

8.11.1 Traffic and Transportation

Delivery of materials to site (e.g. aggregates for road construction, concrete for foundations, delivery of construction plant to site) will only lead to a potential impact on the surrounding road network during construction. Therefore, the interaction between Land, Soils & Geology and Material Assets with Traffic and Transportation is considered to be short term.

8.11.2 Water and Hydrology

Stripping of topsoil will result in exposure of the underlying subsoil layers to the effects of weather.

Surface water run-off may have the potential to infiltrate into underlying soils as the site's groundwater vulnerability is determined to be poor and the aquifer, locally important. Implementation of appropriate mitigation measures as outlined in the CEMP for the site will eliminate the potential for infiltration of surface contaminants into the underlying geology and hydrogeology. Therefore, the interaction between Land, Soils & Geology and Hydrology & Hydrogeology is considered to be imperceptible.

8.11.3 Noise and Vibration

Development of the site will result in a level of noise and vibration related effects on the environment during the construction phase. The interaction between Land, Soils, & Geology and Noise and Vibration is considered to be moderate and temporary in nature.

8.11.4 Air Quality

There is a potential for soil excavation activity to impact on air quality in terms of dust generated. Dust generation can also occur during extended dry weather periods as a result of construction traffic. However, the implementation of suitable mitigation measures as outlined in Chapter 9 Air Quality and Climate and the CEMP for the site will ensure a neutral impact. The interaction between Land, Soils & Geology and Air Quality is considered to be short term-imperceptible-neutral.

8.11.5 Biodiversity

Removal of the existing topsoil layer will be required across the site as well as removal of some trees, hedgerows etc. Chapter 5 (Biodiversity) identifies that the removal of hedgerow habitats will result in some mortality to species and that there will be a loss of ecological corridors and semi-natural habitats until such time as new planting becomes established. These interactions are not considered to be significant.

8.11.6 Risks to Human Health

The following risk to human health from land, soils and geology can occur during construction:

- Dust generation can also occur during extended dry weather periods as a result of construction traffic.

With the implementation of the aforementioned mitigation measures, the likelihood of such events occurring would be local and not significant. The damage to human health is unlikely.

8.12 POTENTIAL CUMULATIVE EFFECTS

The proposed SHD this document addresses has been reviewed in conjunction with the following to assess any cumulative impacts:

- The 'advanced infrastructure works' is subject of a Section 34 application, and that which is currently under consideration by ABP (Ref. ABP-312189-21)
- 'Ballygossan Phase 2' lands to the north in the ownership of Noonan Construction which has been the subject of an SHD pre-application to the Board (Ref. ABP 308583-20). This is included as the cumulative impacts from this project have been assessed with the Advance Infrastructure application.
- Off-site road improvements which were granted by ABP and FCC (ABP Reg. Ref. 309409; FCC Reg. Ref. F20A/0324) to provide the necessary upgrades to local road network.

These developments have been considered and are considered likely to have similar impacts during the construction phase in relation to lands, soils and geology.

Should the construction phase of any developments coincide with development of the site, potential cumulative impacts are not anticipated provided similar mitigation measures are implemented.

8.13 RESIDUAL IMPACTS

With the above noted mitigation measures implemented during the construction phase, the potential impact on land, soils and geology during construction is considered to have a **short term, imperceptible significance**.

There are no likely significant impacts on the land, soil or geological environment associated with the proposed operational development of the site. As such, the impact is considered to have a **long term, imperceptible significance** with a **neutral impact on quality**.

8.14 RISK OF ACCIDENTS AND DISASTERS

The following accidents & disasters involving soils during construction could potentially give rise to a serious incident putting people at risk:

- Collapse of trench during excavation works.
- Accidental spills and leaks may result in contamination of the soils underlying the site.

With the implementation of the aforementioned mitigation measures, the likelihood of such events occurring would be local and minimal.

On completion of the construction phase, there will be no further unplanned events anticipated on land, soils and geology.

8.15 REFERENCES

- Greater Dublin Strategic Drainage Study (2005) – Fingal County Council, Dublin City Council, Dún Laoghaire-Rathdown County Council, South Dublin County Council, Wicklow County Council, Kildare County Council, Meath County Council.
- The Greater Dublin Region Code of Practice for Drainage Works (2012) – Fingal County Council, Dublin City Council, Dún Laoghaire-Rathdown County Council, South Dublin County Council, Wicklow County Council, Kildare County Council, Meath County Council.
- Code of Practice for Water Infrastructure (2020) – Irish Water.
- Code of Practice for Wastewater Infrastructure (2020) – Irish Water.
- Ground Investigation Report (GII, Issue Date June 2020, report no. 9225-11-19).
- Environmental Protection Agency (EPA) Online Mapping Service.
- Geological Survey of Ireland (GSI) Online Mapping Service.
- Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements. Institute of Geologists of Ireland (2013).
- Environmental Impact Assessment of Projects – Guidance on the Preparation of the Environmental Impact Assessment Report (2017)
- Guidelines on the information to be contained in environmental impact assessment reports. Environmental Protection Agency (Draft 2017).
- 190170-DBFL-XX-XX-RP-X-001 Engineering Services Report submitted by DBFL.
- 190170-DBFL-XX-XX-RP-X-003 Preliminary Construction and Environmental Management Plan submitted by DBFL.