

8.0 LAND AND SOILS

8.1. Introduction

This chapter of the EIAR comprises of an assessment of the likely impact of the proposed development on soils and the geological environment as well as identifying proposed mitigation measures to minimize any impacts

8.2. METHODOLOGY

The assessment of the potential impact of the activity on water and hydrology was carried out according to the methodology specified in the following guidance documents:

- Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Statements (2017);

The principal attributes (and impacts) to be assessed include the following:

- Geological heritage sites in the vicinity of the perimeter of the subject site;
- Landfills, industrial sites in the vicinity of the site and the potential risk of encountering contaminated ground;
- The quality, drainage characteristics and range of agricultural uses of soil around the subject site;
- Quarries or mines in the vicinity, the potential implications (if any) for existing activities and extractable reserves;
- The extent of topsoil and subsoil cover and the potential use of this material on site or requirement to remove it off-site as waste for disposal or recovery;
- High yielding water supply springs/ wells in the vicinity of the subject site to within a 2 km radius and the potential for increased risk presented by the proposed development;
- Classification (regionally important, locally important) and extent of aquifers underlying the study area perimeter and increased risks presented to them by construction and operation related activities associated with aspects such as for example removal of subsoil cover, removal of aquifer (in whole or part), drawdown in water levels, alteration in established flow regimes, change in groundwater quality;
- Natural hydrogeological/ karst features in the area and potential for increased risk presented by the activities at the proposed development site; and
- Groundwater-fed ecosystems and the increased risk presented by the construction and operational phases of the proposed development both spatially and temporally.

The following sources of information were consulted to establish the baseline environment: -

- The Geological Survey of Ireland (GSI) online well card and groundwater records for the area were inspected, with reference to hydrology and hydrogeology;
- EPA water quality monitoring data in the area;

- EPA Geoportal website;
- Site Investigation, Allegro warehouse, Carmanhall Road, Sandyford, Report Reference 6740 dated September 1998.
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From the GSI /EPA website, the following information was obtained: -

- Soil Map;
- Bedrock Geology Maps;
- Quaternary (Subsoils) Maps;
- Well Card Database (Groundwater Wells);
- Historical Geological 6 inch: 1 mile maps;
- Database of Site Investigations/Surveys;
- Waste sites, mine sites and industrial locations; and
- Geological heritage locations.

8.3 RECEIVING ENVIRONMENT

8.3.1 SOILS

The soils type at the proposed development from Teagasc is classified as Soils, with material description as made ground. Refer figures below.

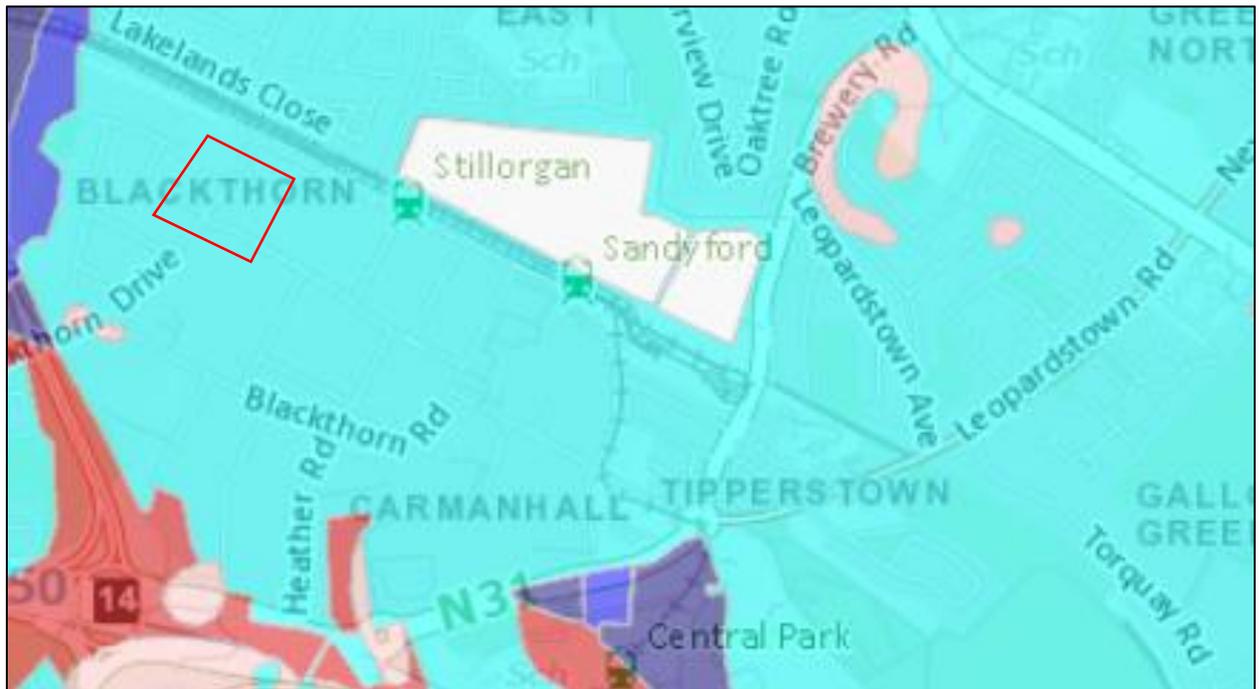


Figure 8.1 – Teagasc Topsoils

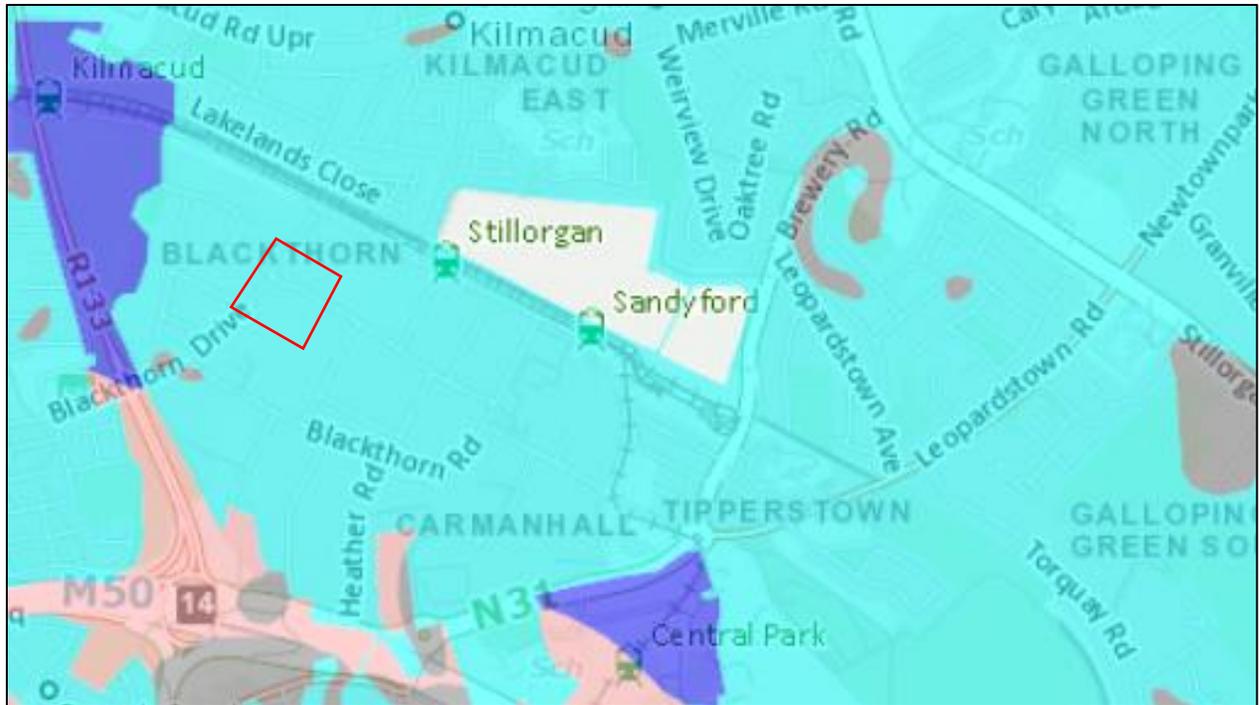


Figure 8.2 – Teagasc Subsoils

8.2.1. GEOLOGY

The GSI quaternary maps for the region indicate that the soil type for the region is till (boulder clay). Refer extracts from this document, shown below.

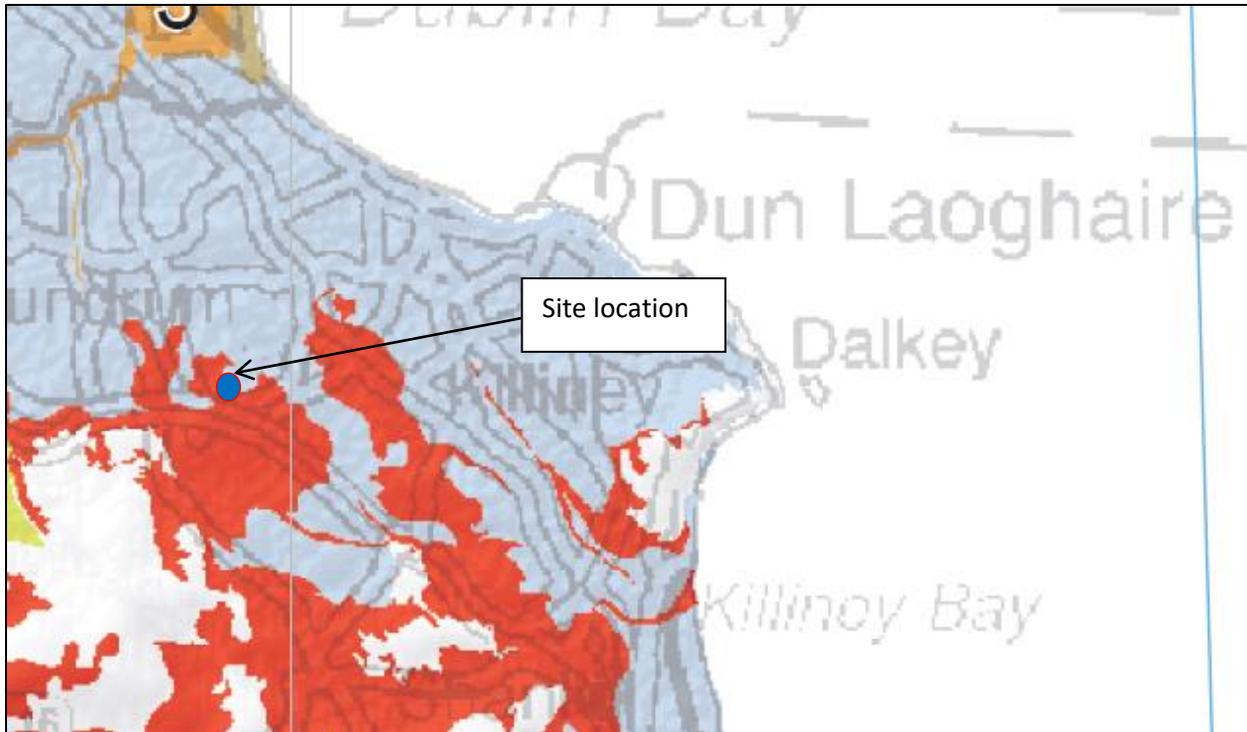


Figure 8.3 - Map extract from Quaternary Map issued by Geological Survey of Ireland, with site indicated

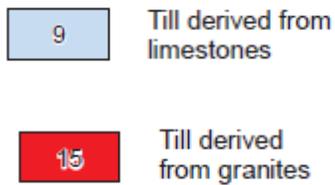


Figure 8.4- Legend extract from Quaternary Map issued by Geological Survey of Ireland

The original site investigation records for the site, from prior to the construction of the existing development, also indicate that the natural soils on site are generally clay, with a mixture of gravelly, silty gravelly, and sandy clay types present.

8.3. CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development in relation to soils and geology will comprise:

- The construction of a multi storey building above a partially constructed basement and ground floor slab
- Excavation for installation of services, pavements and landscaping on existing soil
- Service works below the existing basement.

8.4. POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

8.4.1. CONSTRUCTION PHASE

8.4.1.1. STRIPPING OF TOPSOIL

Minor topsoil removal and replacement will be required to implement the required works.

8.4.1.2. EXCAVATION OF SUBSOIL LAYERS

Minor subsoil removal will be required where works require excavation to install services and other works. The impact of this is expected to be minimal.

8.4.1.3. IMPORTED FILL

Imported fill for the site is expected to be negligible.

8.4.1.4. CONSTRUCTION TRAFFIC

Construction traffic will be in operation during the proposed works. This will comprise construction workers, temporary special construction vehicles, cranes, and excavation machinery. Their impact on the land and soil is expected to be limited to their operations related to the construction works, and therefore is expected to be short term in nature.

8.4.1.5. ACCIDENTAL SPILLS AND LEAKS

During construction of the development, there is a potential risk from accidental pollution incidences from the following sources: spillage or leakage of oils and fuels stored on site; spillage or leakage of oils and fuels from construction machinery or site vehicles; spillage of oil or fuel from refuelling machinery on site; and the use of concrete and cement during appropriate foundation and sub-structure construction.

Accidental spillages may result in contamination of soils and groundwater underlying the site should contaminants migrate through the subsoils and impact underlying groundwater. Soil stripping and excavation for drainage lines will also reduce the thickness of subsoils in localised areas.

Concrete (specifically, the cement component) is highly alkaline and any spillage which migrates through the subsoil would be detrimental to groundwater quality.

8.4.1.6. GEOLOGICAL ENVIRONMENT

There are no likely significant impacts on the geological environment associated with the proposed development of the site.

8.4.2. OPERATIONAL PHASE

At operational phase, impacts on land and soils from the development will be limited to the limited risk of fuel leaks from cars parked in the basement leaking into the ground.

8.4.3. 'DO NOTHING' SCENARIO

If the site was not adjusted, it would remain in its current condition as a partly constructed building in an urban environment. The land and soils would still be in a disturbed state since the area around is already a developed urban environment.

8.5. AMELIORATIVE, REMEDIAL OR REDUCTIVE MEASURES

8.5.1. CONSTRUCTION PHASE

8.5.1.1. STRIPPING OF TOPSOIL

The majority of soil stripping occurred in the previous phase of construction. However, any temporary storage of soil required will be carefully managed in such a way as to prevent any potential negative impact on the receiving environment; the material will also be stored away from any surface water drains. Movement of material will be minimised in order to reduce degradation of soil structure and generation of dust.

8.5.1.2. EXCAVATION OF SUBSOIL LAYERS

All excavated materials will be visually assessed for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of possible contaminants in order to ensure that historical pollution of the soil has not occurred at the proposed development site.

Should it be determined that any of the soil excavated is contaminated, this will be managed according to best practice and disposed of accordingly by a licensed waste disposal contractor.

8.5.1.3. IMPORTED FILL

There is no expected imported fill.

8.5.1.4. CONSTRUCTION TRAFFIC

Construction traffic can be controlled through the use of stabilisation of soils to mitigate any significant effect on the ground. Works will need to be undertaken in accordance with local council requirements.

8.5.1.5. ACCIDENTAL SPILLS AND LEAKS

To minimise any impact on the underlying subsurface strata from material spillages, all oils, solvents and paints used during construction will be stored within temporary bunded areas. Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be bunded to a volume of 110% of the capacity of the largest tank/ container within the bunded area(s) (plus an allowance of 30 mm for rainwater ingress). Drainage from the bunded area(s) shall be diverted for collection and safe disposal.

Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in a designated area (or where possible off the site) which will be away from nearby surface water gulleys or drains. In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as "Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors" (CIRIA 532, 2001) will be complied with.

All ready-mixed concrete will be brought to site by truck. It is recommended that a suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil. The pouring of concrete will take place within a designated area using a geo-synthetic material to prevent concrete runoff into the soil/ groundwater media. Wash down and washout of concrete transporting vehicles will take place at an appropriate facility off site.

In the case of drummed fuel or other chemicals which may be used during construction containers should be stored in a dedicated internally bunded chemical storage cabinet and labelled clearly to allow appropriate remedial action in the event of a spillage.

Potentially contaminated groundwater and polluted surface water generated during construction activities will not be discharged directly to ground or surface drainage. Welfare facilities will be provided for construction operatives but are only likely to comprise individual 'portaloos' with no connection to the foul sewer expected.

8.5.1.6. GEOLOGICAL ENVIRONMENT

The implementation of the operational phase mitigation measures highlighted above will ensure that the soils geology and hydrogeological environment is not adversely impacted during normal and/ or emergency conditions during the operational phase.

8.5.2. OPERATIONAL PHASE

All drainage from within the basement car park will be collected by gullies and drainage pipelines to a fuel interceptor prior to discharge to the local surface water network.

8.5.3. 'DO NOTHING' SCENARIO

In the circumstance whereby nothing is implemented to reduce the impact on the soil and land, the risk of negative effect is not reduced.

8.6. PREDICTED IMPACT OF THE PROPOSED DEVELOPMENT

8.6.1. CONSTRUCTION PHASE

The predicted impact at construction phase is limited to the excavations required to install proposed works. If mitigation measures are implemented, then the risk of impact is negligible.

8.6.2. OPERATIONAL PHASE

As long as relevant impact mitigation measures are implemented, the impact on the operational phase would be limited.

8.6.3. 'DO NOTHING' SCENARIO

If the development is implemented without the proposed mitigation measures, the potential impacts would not be managed.

8.7. MONITORING

Construction stage elements should be monitored by the contractor for compliance with all relevant standards.

The operational phase of the building should be monitored by the management company for the building

8.8. REINSTATEMENT

Any environmental impact should be rectified as soon as is practical.

8.9. INTERACTIONS AND POTENTIAL CUMULATIVE IMPACTS

There is potential for land and soils to interact with other environmental elements. These interactions are listed below.

8.10. INTERACTIONS

8.10.1.1. TRAFFIC AND TRANSPORTATION

Construction traffic will be in have an impact on the land and soils as well as on the traffic on the local road network.

There is no anticipated cumulative effect.

8.10.1.2. WATER AND HYDROLOGY

Any environmentally damaging fluids will have an effect on the surrounding hydrological network. This is discussed further in the hydrology section.

There is no anticipated cumulative effect.

8.10.1.3. WASTE MANAGEMENT

There is no anticipated interaction.

8.10.1.4. NOISE AND VIBRATION

Construction traffic will be in have an impact on the land and soils as well as on the noise on the local environment.

8.10.1.5. AIR QUALITY

Construction traffic will have an impact on the land and soils as well as on the air quality (from dust) on the local environment.

8.10.1.6. FLORA AND FAUNA

There is no anticipated interaction.

8.10.2. POTENTIAL CUMULATIVE IMPACTS

There is no anticipated cumulative impacts.