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Volume 1

EIAR Non-Technical Summary

**FOR
PROPOSED INFILL DEVELOPMENT
AT
JOHNSTOWNBRIDGE, CO. KILDARE**

NOVEMBER 2021

**ON BEHALF OF
PJ Doran**

**Kildare County Council
Planning Department**

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Prepared by

Enviroguide Consulting

Dublin

3D Core C, Block 71, The Plaza,
Park West, Dublin 12

Kerry

19 Henry Street
Kermore, Co. Kerry

Wexford

M10, Wexford Enterprise
Centre, Strandfield Business
Park, Rosslare Road, Wexford



www.enviroguide.ie



info@enviroguide.ie



+353 1 565 4730



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1 INTRODUCTION

This Environmental Impact Assessment Report (EIAR) has been commissioned by PJ Doran, the Applicant, in respect of an application for the importation of material to in-fill and re-contour the site at Johnstownbridge, Co. Kildare

An Environmental Impact Assessment Report (EIAR) is an assessment and analysis of potential impacts on the receiving environment that may arise as a result of the Proposed Development. An EIAR is required to accompany a planning application for development of a class set out in Schedule 5, Part 1 of the Planning and Development Regulations which exceeds a limit, quantity or threshold set for that class of development.

Schedule 5, Part 2 of the Planning Regulations defines projects that are assessed on the basis of set mandatory thresholds for each of the project classes including:

"Schedule 5, Part 2 - Infrastructure projects

11(b) Installations for the disposal of waste with an annual intake greater than 25,000 tonnes not included in Part 1 of this Schedule.

The lifespan of the Proposed Development will be 5 years with a total infill volume of 128,461 tonnes (Fill area 1: 103,456 tonnes, Fill area 2: 25,005 tonnes). This equates to approximately 25,700 tonnes annually. The Proposed Development requires a mandatory EIA due to the intake being more than the threshold of 25,000 tonnes.

In assessing the environmental impacts, this EIAR evaluates the existing situation and assesses any potential impacts of the Proposed Development. Where potential impacts are identified, mitigation measures have been proposed. In addition, the in-combination effects of any other known plans or projects have also been identified and assessed.

This Non-Technical Summary (NTS) describes the Proposed Development, the Environmental Impact Assessment (EIA) process and summarises the key environmental impacts arising from each of the environmental assessments carried out by a panel of experts in accordance with best practice. The environmental assessments involved desktop studies, site visits, surveys, and site-specific investigations.

2 OVERVIEW OF THE PROPOSED DEVELOPMENT

The Proposed Development comprises the importation of material to in-fill and re-contour a site which was previously quarried. The Applicant proposes, subject to the grant of permission, to import clean greenfield soil, subsoil and stone to remediate approximately 3.689ha of the total site. The 3.689ha is divided into two distinct areas – Area 1 is 2.718ha and Area 2 is 0.971ha. A fill plan has been drawn up for the importation of 68,970m³ of soil to fill Area 1, and 16,670m³ to fill Area 2, equating to a total of 85,640m³ (ca. 128,460 tonnes) of soil and subsoil. A volume to weight conversion factor of 1.50 is taken from the Waste Management (Landfill Levy) Regulations, 2008, SI 199 of 2008. The surface layer will comprise of 300mm of topsoil which will be graded to an even surface finish. It is proposed even out the levels of the site in order to allow for the safety of grazing animals. Once the importation is complete the Applicant will seed the land in line with Teagasc guidelines and return it to agricultural use. The proposed

new levels and fill plan are detailed in Drawings P-01 to P-07 prepared by Enviroguide Consulting, 2022 (refer to Appendix A).

Once planning permission is obtained, it is intended to apply to Kildare County Council for a Waste Facility Permit. Material will be accepted in accordance with the conditions of the permit. As part of the Environmental Management Plan a register of incoming materials for the site will be maintained at all times.

It is proposed to accept material onto the site from 08.00 until 18.00 Monday to Friday and 08.00 to 14.00 on Saturday. It is not proposed to operate on Sundays or Bank Holidays.

Temporary welfare facilities will be located in the northeast of the site as per Figure 2-2, Site Layout Plan and harvested rainwater will be used in the wheel wash or for dust suppression.

Soil will be imported using Heavy Goods Vehicles from contractors authorised to transport waste, coming from a known source which has previously been inspected. In the interest of maintaining quality of incoming material the number of contractors delivering material to the site will be limited to a single contractor. Prior to deposition the consignment note for each load will be inspected by the site supervisor to ensure that the material is acceptable, and each load will be evaluated in accordance with the site's waste acceptance procedure.

The site has the potential to import inert soil and stones for land improvement for agriculture uses and will also improve drainage. As the site elevations decrease from across the site, with the most acute declines located to the north, it is proposed to raise the northern, central and southern sections of the site to come in line with the boundary elevations, refer to Drawings P-04 and P-05 for elevations. The proposed plant will consist of a tracked bulldozer for placing the soil and compressing it to a compaction level that will permit good drainage. An excavator may be brought on to site from time to time to construct internal haul roads.

Thus, the focus of the proposed filling is concentrated in the central and eastern areas of the site. Cut and fill cross sections for the Proposed Development are attached (refer to drawings included as Appendix A). Details of existing ground level, proposed change in elevation and final fill level are detailed in Drawings P-01 to P-07. It is proposed to carry this work out over a 5-year period, subject to the availability of appropriate soil, to allow the soil to settle naturally with minimal compaction. The soil and subsoils will be mixed, to minimise compaction and improve drainage.

Filling operations will be confined to a selected area of the site at any one time with each area being restored in a timely manner from commencement of the next phase. The proposed new levels and fill plan are detailed in Drawings P-01 to P-07 prepared by Enviroguide Consulting, 2022 (refer to Appendix A).

A 10-meter buffer and silt fence will be maintained along the eastern boundaries of the site where no soil importation will take place to protect surface waters thus ensuring that there are no offsite nuisances created by the site activity.

The re-profiling of the surface will be carried out to allow for the planting of native grassland as recommended by Teagasc. The re-profiling works will be supervised by a qualified

landscape architect to ensure that the filling is carried out in a manner that will derive maximum benefit from this.

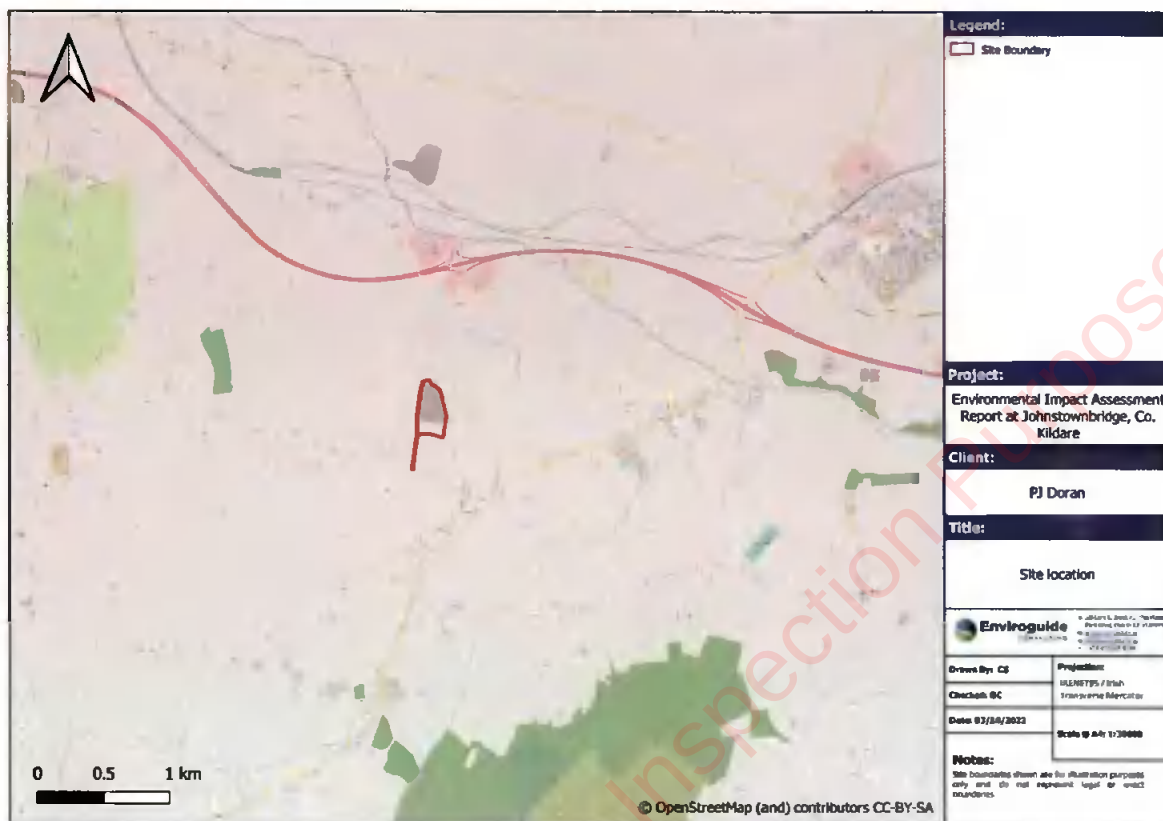
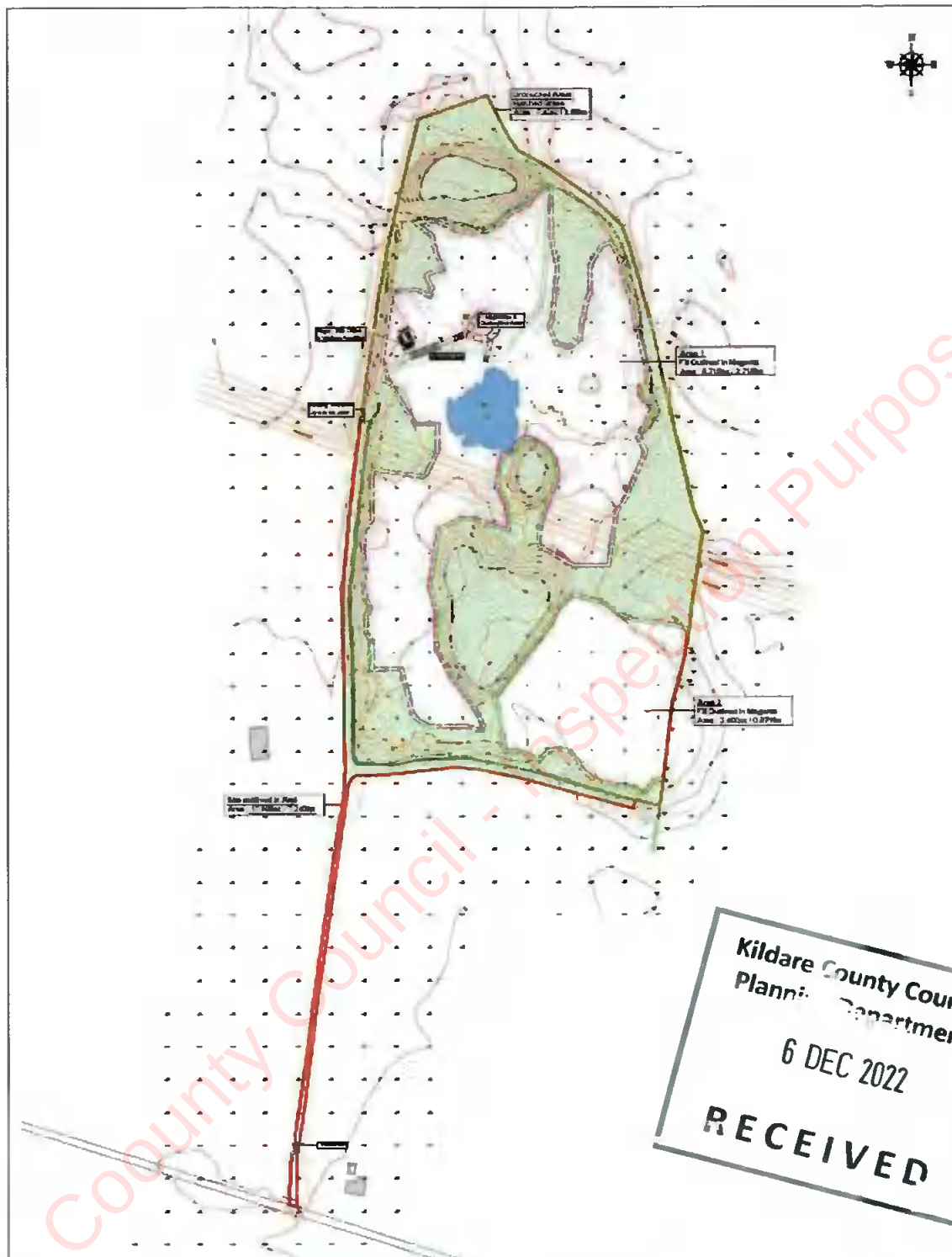


Figure 2-1: Location of the Proposed Development





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EMAIL:
info@enviroguide.ie
PHONE:
+353 (0) 565 4730
WEBSITE:
www.enviroguide.ie



Johnstown Bridge
DRAWING TITLE:
Proposed Site Layout
DEPARTMENT: DRAWING STATUS:
Engineering Planning

CLIENT:
PJ Doran
LOCATION:
Johnstown Bridge,
Cloghan, Co. Kildare

DRAWN BY: SD RH
CHECKED: SD RH
DRAWING NO.: P-07
DATE: 05/11/2022
SCALE: 1:1000
@ A1

Figure 2-2: Proposed Site Layout Plan

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3 SITE DESCRIPTION

The Proposed Development is situated in the Townland of Thomastown in the Barony of Carbury, in the Electoral Division of Cadamstown, Co. Kildare

The Proposed Development will be accessed via the existing entrance point from the L1522.

Johnstown Bridge village is located ca. 1.7km to the east of the site and the village of Kilshanroe is 1.9 km to the south-west. The setting is predominantly rural with surrounding land uses of agriculture, forestry and a number of one-off residential dwellings and one-off commercial type facilities. The site is located approximately 2.5km from junction 9 on the M4 motorway.

The Proposed Development has a total area, including the access road, of 7.243 hectares (ha) (17.898 acres).

4 ENVIRONMENTAL IMPACTS

The potential Environmental Impacts of the Proposed Development during all phases of the Proposed Development are addressed in the EIAR under the following headings as prescribed under the EIA Directive:

- Population and Human Health
- Biodiversity
- Land and Soils
- Hydrology and Hydrogeology
- Air Quality and Climate
- Noise and Vibration
- Landscape and Visual Amenities
- Archaeology and Cultural Heritage
- Material Assets: Traffic, Waste and Utilities



Additionally, risk management and interactions between environmental factors have been examined along with a programme of mitigation and monitoring measures.

4.1 Population and Human Health

Human beings are one of the most important elements of the 'environment' to be considered. One of the principal concerns in any Proposed Development is that the local population experiences no reduction in the quality of life as a result of the Proposed Development on either a permanent or temporary basis.

The impacts of the Proposed Development on the Population and Human Health were examined for the proposed Development at Johnstown Bridge, Co Kildare. The chapter specifically focuses on Population, Employment, Travel, and Human Health.

The Proposed Development will involve limited excavation and regrading of soil. The Proposed Development, including the construction phase, will have a slight, positive impact on human health through the creation of 1-2 jobs as employment and income are among the

most significant determinants of long-term social health. All workers employed during the operation of the Proposed Development will comply with the relevant HSE guidelines and any Government protocols that will be in place at that point in time in relation to Covid-19.

The Operational Phase related activities have the potential to positively impact the local population by creating employment. Approximately 1 to 2 jobs will be created as a result of the Proposed Development. The operational phase will result in the quarrying activities at a new quarry facility which has potential to cause noise and dust. Due to the location of the Proposed Development, noise and dust is not considered to cause disturbance to the local residents. There will be no long-term, significant negative impacts during the operational phase of the Proposed Development. Noise and dust monitoring will be carried out at the proposed development.

The assessment concludes that the Proposed Development will provide employment which will be a positive effect for the local area and will provide a slight positive impact to the overall economy of the local area through indirect socioeconomic benefits to local services including local shops and service stations. There will be no significant negative impacts on the population and human health of the surrounding area as a result of the Proposed Development.

4.2 Biodiversity

The biodiversity assessment is informed by a series of surveys including bird surveys, mammal surveys and habitat and flora surveys. The potential for the Proposed Development to impact on a nearby protected area is also considered.

The existing habitats at the Site are of high ecological and biodiversity value. The Site consists of large areas of wet grasslands, dense scrub and boundary treelines. These habitats provide foraging, nesting, roosting and commuting potential for local terrestrial fauna, with the treelines and boundary scrub contributing to the network of ecological corridors in the wider area. The ecological corridors and central scrub habitats are proposed to be retained to avoid negative impacts to this connectivity and to maintain the majority of habitats suitable for nesting and resting fauna.

Additionally, the Site contains a selection of ponds in variable sizes and depths, which were recorded to support freshwater invertebrates, fish, amphibians, and waterfowl. In the context of the wider landscape, the Site experiences relatively low level of disturbance, as cattle cannot graze on the Site in its current condition, and the sand quarrying activity is very limited at present. The Site represents a relatively unique assemblage of habitats in the wider landscape, and likely supports higher biodiversity when compared to same. Three non-native invasive species were also recorded at the Site, namely Japanese Knotweed, Butterfly Bush and Sycamore. Mitigation measures for addressing the potential spread of invasive species have been provided.

Bird activity was high with species ranging from passerine birds to waterfowl. The scrub and treelines being retained will serve to avoid long-term negative impacts on the majority of bird species recorded at the Site, however ground-nesting species were also recorded, as well as waterfowl nesting within the margins of the central pond proposed for infilling. As such, vegetation clearance and infilling of the central pond will be carried out outside of the nesting

season to avoid negative impacts on breeding birds. However, loss of the central pond will have a negative long-term impact on waterfowl species breeding at the Site.

Both adults and tadpoles of the Common Frog were recorded at the Site. It is proposed to retain some of the suitable frog breeding habitats at the Site, reducing the impact on local frog populations from the Proposed Development. Additionally, the NPWS will be consulted prior to commencing works to determine the best approach in mitigating any negative impacts on breeding frogs at the Site.

Evidence of mammal activity was recorded at the Site, including scat, dens and commuting trails through the grasslands and into the scrub and boundary habitats. The scat was mostly identified as Fox; however, a single possible badger latrine was also recorded. A Pine Marten was observed commuting via the hedgerows lining the access road. A set of mitigation measures have been recommended for the Construction and Operational Phases to avoid and mitigate any impacts to mammals utilising the Site.

No dedicated bat surveys were undertaken at the Site however the habitats present at the Site are considered to provide suitable foraging habitat for bat species, however no suitable roosting features were recorded. The ponds and grasslands support a variety of insects which are likely to attract bats from the surrounding landscapes to forage at the Site. The Proposed Development will not see an increase in the ambient lighting conditions at the Site, and the infilling activity is expected to introduce only low levels of noise disturbance. Therefore, the Proposed Development is not likely to cause light or noise related impacts on bats. The loss of diversity in foraging habitats is likely to have a slight negative impact on foraging bat activity at the Site.

The Site is hydrologically linked to two European sites, namely the River Boyne and River Blackwater SAC [002299] and River Boyne and River Blackwater SPA [004232] via a small stream that flows adjacent to the eastern boundary of the Site. This stream eventually joins the River Blackwater downstream. However, the Proposed Development is not expected to result in negative impacts on any designated sites, as the distances between the designated sites and the Proposed Development are sufficient to exclude the potential for impacts via land, air or hydrological pathways arising from the infill works and operation of HGVs and heavy plant on the Site of the Proposed Development.

The habitats covered by the infilling activity are considered to be relatively unique and undisturbed within the wider agricultural landscape. Provided all mitigation measures detailed in the Biodiversity Chapter are implemented in full and remain effective throughout the lifetime of the Development, the only remaining impacts relate to loss of habitats.

4.3 Land and Soil

An assessment of the potential impact on the existing land, soils and geological environment was carried out by Enviroguide Consulting for the Proposed Development Site.

The assessment was carried out taking cognisance of appropriate national guidelines and standards for Environmental Impact Assessment using data collected from a detailed desk study, site walkover surveys, and review of all relevant drawings and documents pertaining to the Proposed Development. The results of the assessment provided information on the baseline conditions at the Proposed Development Site. A detailed assessment of the potential

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impacts was undertaken, and appropriate avoidance and mitigation measures were identified to reduce any identified potential impact associated with the Proposed Development.

The Proposed Development comprises the importation of material to in-fill and re-contour the Site. The Applicant proposes, subject to the grant of permission, to import clean soil and sub-soil from greenfield development Sites to restore 3.689Ha of the total Site.

The Proposed Development will comprise the importation of a maximum of approximately 85,640.342m³ (128,460.5 tonnes) of greenfield soil and subsoil. Importation of material to in-fill and re-contour the Site will be undertaken over a period of approximately 5 years, subject to the availability of appropriate soil.

Once the backfilling works are complete, the re-profiling of the surface will be carried out to allow for the planting of native grassland and supervised by a qualified landscape architect to ensure that the filling is carried out in a manner that will derive maximum benefit from this.

There are no significant construction works proposed at the Site with limited excavation and regrading of soil required. The Site office and welfare facilities, and the weighbridge and wheel washing facilities will be prefabricated and delivered to Site.

The Proposed Development will be subject to a Waste Facility Permit (WFP) from Kildare County Council (KCC). The operator will comply with the environmental control and mitigation requirements as per the conditions of the WFP.

An Environmental Management System (EMS) will be developed for the Proposed Development and control and mitigation requirements will be strictly implemented for the duration of the Operational Phase to mitigate any potential impact on the receiving land, soils and geology.

Quality control procedures will be in place to check and verify all materials imported for restoration at Site are acceptable. The importation of greenfield or equivalent as per EPA guidelines (EPA, 2020) soil and stone will be subject to control procedures which shall include testing for contaminants, invasive species and other anthropogenic inclusions.

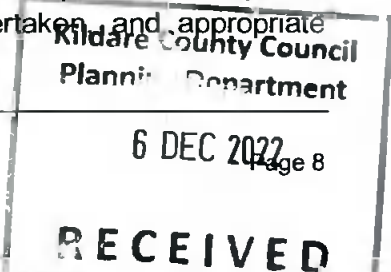
There will be no significant adverse residual impacts on, or associated with the land, soils and geology associated with the Proposed Development.

The proposed Site restoration will have an overall, positive, long-term impact on land, soils and geology resulting in an improved land use quality at the Site.

4.4 Hydrology and Hydrogeology

An assessment of the potential impact on the existing hydrological (surface water) and hydrogeological (groundwater) environment was carried out by Enviroguide Consulting for the Proposed Development Site.

The assessment was carried out taking cognisance of appropriate national guidelines and standards for Environmental Impact Assessment using data collected from a detailed desk study, site walkover surveys, groundwater and surface water monitoring and sampling including laboratory analysis of groundwater and surface water samples and review of all relevant drawings and documents pertaining to the Proposed Development. The results of the assessment provided information on the baseline conditions at the Proposed Development Site. A detailed assessment of the potential impacts was undertaken, and appropriate



avoidance and mitigation measures were identified to reduce any identified potential impact associated with the Proposed Development.

The Proposed Development comprises the importation of material to in-fill and re-contour the Site. The Applicant proposes, subject to the grant of permission, to import clean soil and sub-soil from greenfield development Sites to restore 3.689Ha of the total Site.

The Proposed Development will comprise the importation of a maximum of approximately 85,640.342m³ (128,460.5 tonnes) of greenfield soil and subsoil. Importation of material to in-fill and re-contour the Site will be undertaken over a period of approximately 5 years, subject to the availability of appropriate soil.

Once the backfilling works are complete, the re-profiling of the surface will be carried out to allow for the planting of native grassland and supervised by a qualified landscape architect to ensure that the filling is carried out in a manner that will derive maximum benefit from this.

There are no significant construction works proposed at the Site with limited excavation and regrading of soil required. The Site office and welfare facilities, and the weighbridge and wheel washing facilities will be prefabricated and delivered to Site.

The Proposed Development will be subject to a Waste Facility Permit (WFP) from Kildare County Council (KCC). The operator will comply with the environmental control and mitigation requirements as per the conditions of the WFP.

The management and storage of greenfield soil and stone imported to the Site will be carried out in accordance with the pollution prevention controls/ mitigation measures in the Environmental Management System (EMS) that will be developed for the Operational Phase of the Proposed Development.

Imported soils will be sealed to prevent run-off of rainwater /or the generation of dust.

Discharges to the Thomastown Stream will not be permitted. A 10-meter buffer and silt fence will be maintained along the eastern boundaries of the Site where no soil importation shall take place to protect surface waters and to ensure that there are no offsite nuisances created by the Site.

An earth bund and silt fence will be constructed around the perimeter of the infill area. The earth bund and silt fencing will act as temporary sediment control devices to protect receiving watercourses from sediment and potential surface water run-off from the Site. The fencing will be inspected twice daily based on Site and weather conditions for any signs of contamination or excessive silt deposits and records of these checks will be maintained.

The infilling of the existing open waterbodies onsite will be undertaken with cognisance to Construction Industry Research and Information Association (CIRIA), 2006. 'Control of Water Pollution from Linear Construction Projects: Technical guidance' (CIRIA C649) and 'Control of water pollution from construction sites. Guidance for consultants and contractors (C532)'.

There will be no significant adverse residual impacts on the receiving hydrological and hydrogeological environment associated with the Proposed Development.

The proposed Site restoration will have an overall 'positive', 'slight', and 'permanent' impact on the vulnerability of the underlying groundwater environment.

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There will be no impact to the existing WFD Status of water bodies associated with the Proposed Development including the Thomastown Stream, the Blackwater (Longwood) River, the River Boyne and the Trim GWB as a result of the Proposed Development taking account of design avoidance and mitigation measures where required.

4.5 Air Quality and Climate

This chapter examines the potential for the Proposed Development to impact upon air quality and climate within the vicinity of the proposed site. This chapter also describes and assesses the impact of the Proposed Development on local climate and on global climate in a wider context.

There are a number of potential sources of dust generation associated with the operations of the Proposed Development at Thomastown, Johnstownbridge, Co. Kildare. The primary sources of dust identified include stockpiling, handling, and placement of materials, and traffic movements on internal and external haul routes.

Dust emissions associated with vehicular movements are largely due to the resuspension of particulate materials that are present on road surfaces. The movement of vehicles within the facility and to and from the facility to the external road network has potential to cause dust due to deposition from the vehicles themselves if appropriate mitigation measures are not considered. The potential for dust generation depends on site activity, particle size, the moisture content of materials, and weather conditions. During periods of prolonged dry weather, the transfer of soil and subsoil material has the potential to increase dust concentrations in air quality. Where rainfall has or is occurring, dust emissions can be dramatically reduced.

Data collected from Met Eireann has shown that the most frequent wind direction prevails from the west-southwest. The corresponding most frequent wind speed is 7 and 10 knots which is considered a 'Gentle Breeze' on the Beaufort scale. In the event of dry weather, any wind speeds above 1-3 knots are likely to cause fugitive dust.

Sensitive receptors in the vicinity of the development are described as one off rural housing and farm buildings of low density. Dust deposition is most likely to occur within 100m of the site. For the purpose of this study, all sensitive receptors within a 400m radius were identified. Sensitive receptors likely to be impacted by prevailing wind conditions would need to be positioned to the northeast and east of the site; there are no receptors positioned to the northeast of the site. All receptors are positioned more than 100m away from the Proposed Development which suggests that potential fugitive dust will have adequate time to deposit on the preceding landscape before reaching the sensitive receptors. Furthermore, the trees and hedgerows which are currently present on the site boundary will further act as a natural buffer for dust deposition for all sensitive receptors. It can therefore be concluded that dust emissions associated with the Proposed Development will not have a significant impact on the local sensitive receptors.

Combustion emissions from onsite machinery and traffic derived pollutants of CO₂ and N₂O will be emitted during facility operations. However, as concluded in Chapter 12, Section 12.1 *Traffic*, the development will not result in any significant change to current traffic movements. Therefore, no significant increases in associated greenhouse gas emissions are expected and

it is concluded that macro and micro-climatic impacts as a result of the Proposed Development are negligible.

4.6 Noise and Vibration

This assessment will examine the likely impacts of sound pressure levels generated by the Proposed Development located in the townland of Thomastown, Co. Kildare. Noise calculations will be used to predict and assess the likely impact of facility operations on noise sensitive receptors. The likely noise and vibration impacts associated with the Proposed Development have been evaluated, and changes that are likely to impact the surrounding environs have been considered.

The primary noise impacts associated with this Proposed Development is noise due to:

- Truck movements through the site and tipping of inert materials
- Additional plant and equipment within the facility

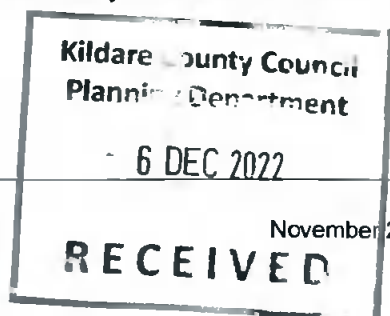
Table 4-1 shows the recommended noise limits for the Waste Facility Permit application relating to this Proposed Development.

Table 4-1: Recommended Noise Limit Criteria (Source: EPA NG4)

Scenario	Daytime Noise Criterion, dB L _A r,T (07:00 to 19:00hrs)	Evening Noise Criterion, dB L _A r,T (19:00 to 23:00hrs)	Night-time Noise Criterion, dB L _A eq,T (23:00 to 07:00hrs)
Quiet Area	Noise from the permitted site to be at least 10dB below the average daytime background noise level measured during the baseline noise survey.	Noise from the permitted site to be at least 10dB below the average evening background noise level measured during the baseline noise survey.	Noise from the permitted site to be at least 10dB below the average night-time background noise level measured during the baseline noise survey.
Areas of Low Background Noise	45dB	40dB	35dB
All other Areas	55dB	50dB	45dB
Proposed Noise Limits for the Proposed Development	55dB	50dB	45dB

Nine Noise Sensitive Locations (NSL) were identified within 250m of the Proposed Development. Noise prediction calculations have been completed for noise from the use of onsite plant up to 500m from the source using the inverse square law. According to the inverse square law, for each doubling of distance from a point source, the sound pressure level decreases by approximately 6 dB.

The adopted criteria will not be exceeded by any construction equipment, nor will it be exceeded by the machinery associated with the proposed activities at the nearest sensitive receptors.



Due to the nature of the proposed operations, there is no continuous noise source associated with the importation of soils to the site. The occasional trucks intermittently entering and leaving the site and the tipping of soils and subsoils will result in intermittent noise being generated at the Proposed Development. The levels of noise generated as a result of these activities will not be continuous.

No traffic routes are predicted to experience increases of more than 25% in total traffic flows during the operational phase and therefore no detailed assessment is required as per the Design Manual for Roads and Bridges (DMRB) Guidelines.

4.7 Landscape and Visual

The purpose of the landscape assessment is to evaluate the existing landscape character of the site and surroundings, to assess the landscape and visual impact of the Proposed Development and to identify landscape designations and planning policies that may concern the subject site and its environs.

This chapter has related the Landscape Impact Assessment (LIA) and the Visual Impact Assessment (VIA) in respect of an application by PJ Doran for the importation of material to in-fill and re-contour the site at Thomastown, Johnstown Bridge, Co. Kildare.

The Proposed Development is situated in the townland of Thomastown, Co. Kildare. Kildare, in the Irish midlands. The Proposed Development has a total area of 7.243 ha (17.898 acres) and lies at or slightly below the level of the public road. Johnstown Bridge village is located ca. 1.5km to the east of the site and the village of Kilshanroe is 1.80 km to the south-west. The setting is predominantly rural with surrounding land uses of agriculture, forestry and a number of one-off residential dwellings and one-off commercial type facilities. The entrance to the Proposed Development is located along an L5014, just off the R 402. The site is located approximately 2.5km from junction 9 on the M4 motorway. The site is mostly composed of spontaneous herbaceous vegetation and artificial lakes and ponds, of a more seasonal character.

The Proposed Development is located in the area classified as *North-Western Lowlands* which was designated as *Class 1 – Low Sensitivity*. The *North-Western Lowlands* were classified as being of 'High' compatibility with Forestry, Housing, Urbanisation, Infrastructure, Extraction and Energy and of being 'Most' compatible with Agriculture.

There are no designated scenic routes or protected views located within the vicinity of the site or within the wider vicinity of Thomastown. There are no protected structures within the site boundary.

The Proposed Development comprises the importation of material to in-fill and re-contour a site which was previously quarried. The Applicant proposes, subject to the grant of permission, to import clean greenfield soil, subsoil and stone to remediate approximately 3.689ha of the total site. The surface layer will comprise of 300mm of topsoil which will be graded to an even surface finish. It is proposed to even out the levels of the site in order to allow for the safety of grazing animals. Once the importation is complete the Applicant will seed the land in line with Teagasc guidelines and return it to agricultural use. The focus of filling proposed is concentrated in the central and eastern areas of the site.

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The site of the Proposed Development was considered to have a *Medium Landscape Value*, a *Medium Landscape Susceptibility*, a *Medium-Low Landscape Sensitivity* and that the Proposed Development changes to landscape characteristics are *Medium to High*. In terms of the LIA the Proposed Development will result in the loss of approximately 3.7 ha of habitat assessed as local importance (higher value) as per the NRA (2009b) scheme. Once the importation is complete the Applicant will seed the land and return it to agricultural use. The soil and subsoils will be mixed, to minimise compaction and improve drainage. Considering the percentage of habitat loss but taking into account that the changes are concentrated in specific areas of the site, the returning of the land to agriculture use, and that all existing hedgerows on the peripheral limits of the site are maintained, the Proposed Development will have a moderate and negative landscape impact in the short to medium term. However, after the in-fill and re-contour is completed, the Proposed Development will change to have a neutral impact in the long term.

In what refers to the VIA, 8 viewpoints were assessed, chosen by sensitivity of the view's, through site visits and Viewsheds analysis. All viewpoints were considered to have a neutral long-term visual impact.

In the context of landscape and visual impact and given the agricultural nature of the location of the Proposed Development and its surrounding environment, no cumulative effects are anticipated from the introduction of the Proposed Development.

4.8 Archaeology and Cultural Heritage

An assessment of the baseline Archaeological, Architectural and Cultural Heritage conditions of the surrounding environment for the Proposed Development was completed in order to determine any significant impacts that may arise as a result of the development and highlight any potential effects this may have on these resources.

The assessment involved a desktop study which considered all available archaeological, architectural, historical and cartographic sources. This information was used in order to assess any potential impact on the receiving environment and to identify measures to ensure the conservation of any monuments or features.

There are no records of any recorded monuments within the Site boundary of the Proposed Development. There are 18 no. recorded Monuments and Places within the 2km of the study area. These comprise of 1 Ring-ditch (KD003-035----), 2 Ringfort – Unclassified (KD003-036----) (KD003-037----), 1 Field System (KD003-038----), 1 Ringfort – rath (KD003-018----), 2 Enclosure (KD003-041----) (KD004-036----), 4 Barrow – unclassified (KD003-043----) (KD003-040----) (KD003-039----) (KD003-042----), 1 Fulacht fia (KD003-031----), 1 Ritual site – holy well (KD004-007----), 1 Burial (KD004-042----), 1 Cross (KD004-001----), 1 Armorial plaque (KD004-002----), 1 Architectural fragment (KD004-003----), and 1 Moated site (KD003-025----). A search in the topographical files in the National Museum of Ireland produced no results for the development lands and surrounding areas. The closest recorded topographical files to the Proposed Development is a Pot-Sherd (:36); Saddle Quern, Two Frags. (:37); Saddle Quern (:38) - Name: 1968:36-8 which is 3.62km southeast of the site. The Proposed Development does not lie within the vicinity of any areas classified as Architectural Conservation Areas (ACA) under the Kildare County Development Plan 2017-2023. There are 19 no. buildings of architectural significance located within 2km of the Proposed Development

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Site, the nearest of which is 1.4km east of the site (Water pump, registration number 11801010).

The Construction Phase associated with the project will comprise enabling works including limited excavation and regrading of soil for the construction of the impermeable inspection and quarantine area, installation of the Site office and welfare facilities (portacabins), the weighbridge, and the wheel wash. In the event that any archaeological remains are discovered during the Proposed Development, all works will cease and an expert archaeologist will be brought to Site and all future works will be carried out under the supervision of the archaeologist. However, as the closest RMP site is located 0.6km from the Site, it is predicted that the Construction Phase of the Proposed Development will not cause any significant impact on the Archaeology and Cultural Heritage of the area.

The Operational Phase of the Proposed Development will consist of the importation of soil and subsoil from greenfield development sites. No objects or sites of archaeological or cultural importance were identified during the desktop study and as such there is likely to be no significant effects on the archaeological, architectural or cultural heritage of the area through the operations of the Proposed Development.

There will be no effects on the archaeological, architectural or cultural heritage of the area through development activities that may occur during the Operational Phase.

4.9 Material Assets: Traffic

An assessment of traffic generation of the Proposed Development was carried out by Transport Insights for the site at Johnstownbridge, Co. Kildare.

The existing conditions on the surrounding road network were informed by a 24-hour classified automatic traffic count survey of the L5014, to the immediate east of the existing site access. The survey was undertaken on Tuesday 17 May 2022. The survey results were then used to establish a baseline from which to predict traffic growth on the local road network.

The Proposed Development site is located to the north of L5014, ca. 2.2 kilometres to the west of Johnstown Bridge, Co. Kildare. The R402 is located approximately 600 metres to the east of the subject site and M4 junction 9 is located ca. 3.2 kilometres to the northeast. The area surrounding the site is a primarily agricultural in nature, with low density residential development also present. The Site is accessed via an existing established agricultural access from L5014 to the south of the subject site and leads to an existing access road which connects L5014 to the subject lands.

The setting is predominantly rural with surrounding land uses of agriculture and a number of one-off residential dwellings. The site is bounded by a commercial business. There is a commercial business (Max Pallets) to the west of the site and this has access on the R5014, located 75m to the northwest of the cul-de-sac junction.

Works required to enable site operations are minimal. This includes the transportation of a prefabricated building to site which will form the site office and welfare facilities and the construction of a weighbridge and 4 no. car parking spaces. Given the short temporary nature of the construction phases, the characteristics of the local road network, the impact of the estimated construction traffic is expected to be minimal.

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During the Operational Phase, 2 no. staff are expected to be present on site. The proposed operating hours are 08:00 – 18:00 Monday – Friday, 08:00 – 14:00 on Saturdays. The Proposed Development will not be operational on Sundays or Bank Holidays.

The Operational Phase of the Proposed Development includes the importation of material to in-fill and re-contour the site. The Proposed Development will result in an increase of 6.95% increase in AADT in 2023 and 6.3% increase in 2028. As per TII's Traffic and Transport Assessment Guidelines (May 2014) where *"traffic to and from the development exceeds 10% of the traffic flow on the adjoining road"*, more detailed analysis of a Proposed Development's traffic impacts may be required. The Proposed Development will result in an increase on the L5014, significantly below the 10% threshold.

The transport assessment undertaken for this EIAR demonstrates that there will be no detrimental impacts on the public road network in the vicinity of the site due to the proposed development and is therefore in accordance with the proper planning and sustainable development of the area. There will be no residual impacts.

4.10 Material Assets: Utilities and Waste

This chapter of the EIAR provides an assessment of the potential impacts of the Proposed Development on 'Materials Assets' or the physical resources in the environment, including built services and infrastructure comprising electricity, gas supply, information and communications technology (ICT), surface water/stormwater drainage, water supply, the foul water network and waste management infrastructure.

Only limited Construction works are proposed as part of the current planning application. Additionally, there is no connection to the local electricity supply proposed for the current planning application. Power for all site activities will be provided by a diesel generator, hence there will be no impacts on the local electricity supply as a result of the Operational Phase of the Proposed Development. The project does not rely on gas supply for processing activities onsite and connection to the national gas network is not available in the area, hence the impacts on the local gas supply as a result of the Operational Phase of the Proposed Development will be neutral and negligible in the long term.

There is no requirement for connection to Information and Communications Technology (ICT) by the Proposed Development, hence the impacts on ICT as a result of the Operational Phase of the Proposed Development will be neutral and negligible in the long term.

A closed loop wheel wash and temporary welfare facilities will be prefabricated offsite and will be delivered to the site of the Proposed Development prior to the commencement of site activities. Additionally, prior to the acceptance of any material on-site, existing on-site drainage channels will be piped and filled with appropriate material to facilitate efficient drainage. There will be no storage or handling of deleterious materials such as lubricants, oils etc on site. Spill kits will be provided on-site to deal with any potential spills or leaks that may occur during the delivery of the prefabricated wheel wash and welfare facilities. If the accidental release of deleterious material including fuels from plant/equipment or vehicles on-site (through the failure of secondary containment or a materials handling accident) were to occur over open ground then these materials could infiltrate through the soil contaminating the underlying groundwater and potentially the Thomastown Stream, located along the northeastern boundary of the site. Once infilling activities have ceased the land will be restored and planted

with native grassland. As the surface cover will be changed from glaciofluvial limestone sands and gravels at ground surface to a lower permeability soil, there may be the potential to reduce infiltration to soil and increase surface runoff. The soil will be infilled in a manner to ensure that there will be adequate drainage through soils and in accordance with relevant EPA restoration guidelines and there will be no increased flood risk. Overall, it is considered that the likely impacts of the Operational Phase of the Proposed Development on hydrology and surface water drainage will be neutral and imperceptible in the long term based.

There is only a limited Construction Phase proposed as part of the current planning application and there is no requirement for connection to foul water by the Proposed Development, hence there will be no impacts on the local foul water network as a result of the Construction Phase of the Proposed Development.

A temporary welfare unit will be in place for the infilling phase, which will be self-contained and emptied by vacuum tanker as required. Hence the likely impacts of the Proposed Development on foul water infrastructure are neutral and imperceptible in the short term. Once the infilling activities are complete the site will be returned to agriculture and will not be connected to a municipal foul water system as part of the Proposed Development, therefore there will be no impact on the local municipal foul water system during the Operational Phase of the Proposed Development.

Bottled water will be provided for drinking water. There will be no impact on the local mains water supply during the Operational Phase of the Proposed Development.

A small quantity (<1 tonnes per annum) of non-hazardous canteen waste will be generated by the site operations, which will be stored in wheelie bins on site and collected by an appropriately authorised waste collector and will be sent for recycling, recovery, or disposal to a suitably licensed or permitted waste facility. Wastes generated on site (excluding topsoil) will be collected by an appropriately authorised waste collector and will be sent for recycling, recovery, or disposal to a suitably licensed or permitted waste facility. As the quantity of waste that will be generated will be very small in scale, it is not considered that there will be any impact on waste management in the area. Waste could potentially result from non-routine events, including emergency repairs and accidental fuel spills. In the case of accidental fuel spills or other non-routine events, materials would be stored in a sealed container and collected by a licensed contractor and will be sent for recycling, recovery, or disposal to a suitably licensed or permitted waste facility. Hence there will be a positive impact on waste management as a result of the Proposed Development.

Once planning is obtained, it is intended to apply to Kildare County Council for a Waste Facility Permit for the importation of soil and stones for the infill and re-contouring of the site. Materials will be accepted in accordance with the conditions of the WFP. A register of all incoming material for the infilling activities will be maintained at all times. However, if contaminated soil and stones were to be brought to site through the failure of Waste Acceptance Procedures which will be implemented as a requirement of the Waste Facility Permit, and in the absence of mitigation, it is considered that this could result in a 'negative', 'moderate to significant' and 'medium term' impact on waste management at the site, depending on the nature of the contamination.

If the Proposed Development is not advanced, the Site would remain as a spent quarry with associated spoil heaps, standing water, and unmanaged piles of mixed wastes. If no waste management is undertaken at the site of the Proposed Development, the surrounding environment would be increasingly affected. If no waste management is undertaken at the site of the Proposed Development, the surrounding environment would be increasingly affected. Over time, the area would be recolonised by plants, including the invasive Japanese Knotweed. Without proper site management, this will lead to larger scale problem in the future, requiring increased volumes of mixed waste streams and soil contaminated with invasive species to be treated at an appropriate waste facility.

4.11 Risk Management

Risk is one of the most important elements to be considered as part of a development. It is critical that any project is screened against potential risks which it might encounter and/or impose on the nearby environment during its construction and operational phase. An assessment of the vulnerability of the Site of the Proposed Development to risks of major accidents and/or disasters was completed.

The assessment reviewed:

- The vulnerability of the project to major accidents or disasters.
- The potential for the project to cause risks to human health, cultural heritage and the environment, as a result of that identified vulnerability.

A methodology was used including the following phases:

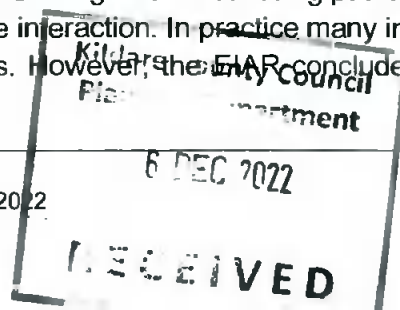
- Phase 1 – assessing the hazards
- Phase 2 – screening the hazards
- Phase 3 – mitigating the hazards and evaluating the residual hazards

The risk assessment conducted for the Proposed Development concludes that the vulnerability of the Proposed Development to major accidents and/or disasters is not considered significant; and the potential for the project to cause risks to human health, cultural heritage, and the environment, is not considered significant.

4.12 Interactions

Interrelationships between various environmental aspects must be considered when assessing the impact of the Proposed Development, as well as individual significant impacts. The significant impacts of the Proposed Development and the proposed mitigation measures have been detailed in the relevant chapters of this report. However, as with all developments that poses potential environmental impacts, there also exists potential for interactions/interrelationships between the impacts of different environmental aspects. The results may exacerbate or ameliorate the magnitude of impacts. This chapter of the EIAR addresses the interactions between the various environmental factors of the Proposed Development.

When considering interactions, the assessor has been vigilant in assessing pathways – direct and indirect – that can magnify effects through the interaction. In practice many impacts have slight or subtle interactions with other disciplines. However, the EIAR concludes that most



inter-relationships are neutral in impact when the mitigation measures proposed are incorporated into the operation of the Proposed Development in line with the Waste Facility Permit for the site.

4.13 Mitigation and Monitoring Measures

This EIAR has assessed the impacts and effects likely to occur as a result of the Proposed Development on the various aspects of the receiving environment.

The Proposed Development will be operated in a manner that will ensure that the potential impacts on the receiving environment are avoided where possible. In cases where impacts or potential impacts have been identified, mitigation measures have been proposed to reduce the significance of specific impacts. These mitigation recommendations are contained within each chapter exploring specific environmental aspects.

The mitigation and monitoring chapter of the EIAR collates and summarises the mitigation commitments made in Chapter 4 to Chapter 12.



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Enviroguide
CONSULTING

Volume 2

Environmental Impact Assessment Report

FOR

PROPOSED INFILL DEVELOPMENT

AT

KILLMURRY, JOHNSTOWNBRIDGE, CO. KILDARE

November 2022

ON BEHALF OF

PJ Doran



Prepared by
Enviroguide Consulting
Dublin
3D Core C, Block 71, The Plaza,
Park West, Dublin 12

Kerry
19 Henry Bstreet
Kenmare, Co. Kerry

Wexford
M10, Wexford Enterprise
Centre, Strandfield Business
Park, Rosslare Road, Wexford

www.enviroguide.ie
info@enviroguide.ie
+353 1 565 4730



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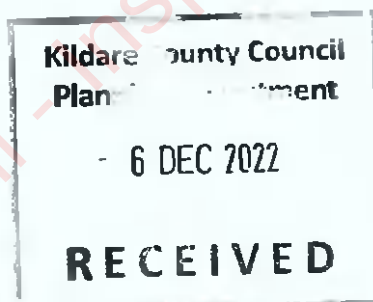
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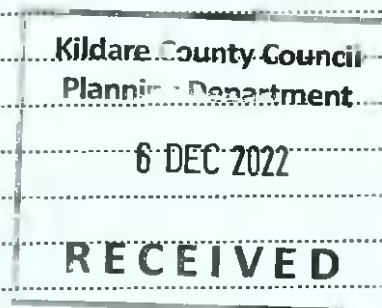


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Appendix A Drawings

Appendix B Groundwater and surface water analytical results

Appendix C Traffic Survey Data



1 INTRODUCTION AND METHODOLOGY

1.1 Introduction

This Environmental Impact Assessment Report (EIAR) has been commissioned by PJ Doran, the Applicant, in respect of an application for the importation of material to in-fill and re-contour the site at Killmurry, Johnstownbridge, Co. Kildare. This EIAR has been compiled in accordance with all current legislation and best practice guidance. This Chapter describes the methodology by which the Environmental Impact Assessment (EIA) was carried out and the EIAR was completed. The methodology used is broadly consistent across all Chapters in order to ensure the EIAR is clear and easy to navigate.

1.1.1 Quality Assurance and Competence

Synergy Environmental Ltd., T/A Enviroguide Consulting, is a wholly Irish Owned multi-disciplinary consultancy specialising in the areas of the Environment, Waste Management and Planning. All of our consultants carry scientific or engineering qualifications and have a wealth of experience working within the Environmental Consultancy sectors, having undergone extensive training and continued professional development.

Enviroguide Consulting as a company remains fully briefed in European and Irish environmental policy and legislation. Professional memberships include the Institute of Geologists of Ireland (IGI), Chartered Institution of Wastes Management (CIWM), the Irish Environmental Law Association and Chartered Institute of Ecology and Environmental Management (CIEEM).

This Chapter was prepared by Louise Hewitt, Environmental Consultants, Enviroguide Consulting. Louise has a Master of Science (Hons) in Environmental Resource Management from University College Dublin and a Bachelor of Science (Hons) in Biology from Maynooth University. Louise has worked as an Environmental Consultant with Enviroguide since 2021 and has experience preparing Environmental Impact Assessment (EIA) Screening Reports, Introduction, Population and Human Health and Archaeology and Cultural Heritage Chapters of EIARs.

1.1.2 Description of the Proposed Development

The Proposed Development (as detailed in Chapter 2) comprises of:

- The importation of soil and subsoil from greenfield development sites. The Applicant proposes, subject to the grant of permission to import clean greenfield soil and stone to remediate approximately 3.79 ha of the total site.

1.2 Definition of EIA and EIAR

EIA is a systematic examination of the potential impacts of a proposed development on the environment. In assessing the environmental impacts this EIAR will evaluate the existing situation and assess any potential impacts of the Proposed Development. Where potential impacts are identified, mitigation measures to address these potential impacts are proposed. In addition, the in-combination effects of any other known plans or projects will be identified and assessed.

Under Schedule 5 of the Planning and Development Regulations 2001, as amended (the Planning Regulations), an EIAR (formerly an EIS) is required to accompany certain planning applications for specified projects as part of the EIA process.

The EIAR describes the outcomes of the iterative EIA process which was progressed in parallel with the project design process. In doing so, it forms the first part of the EIA process that will be completed by Kildare County Council, as the competent authority, which in turn will be required to examine, analyse, and evaluate the direct and indirect effects of the development on the various factors listed in Directive 2011/92/EU, as amended by 2014/52/EU (the EIA Directive).

"The EIAR should be prepared at a stage in the design process where changes can still be made to avoid adverse effects. This often results in the modification of the project to avoid or reduce effects through redesign" (EPA, 2022)

Where significant and likely environmental effects are identified that are unacceptable, the EIA process aims to quantify and minimise the effects of the impact that the specified development has on the environment through appropriate mitigation measures and where necessary, subsequent monitoring.

This process is illustrated in Figure 1-1.



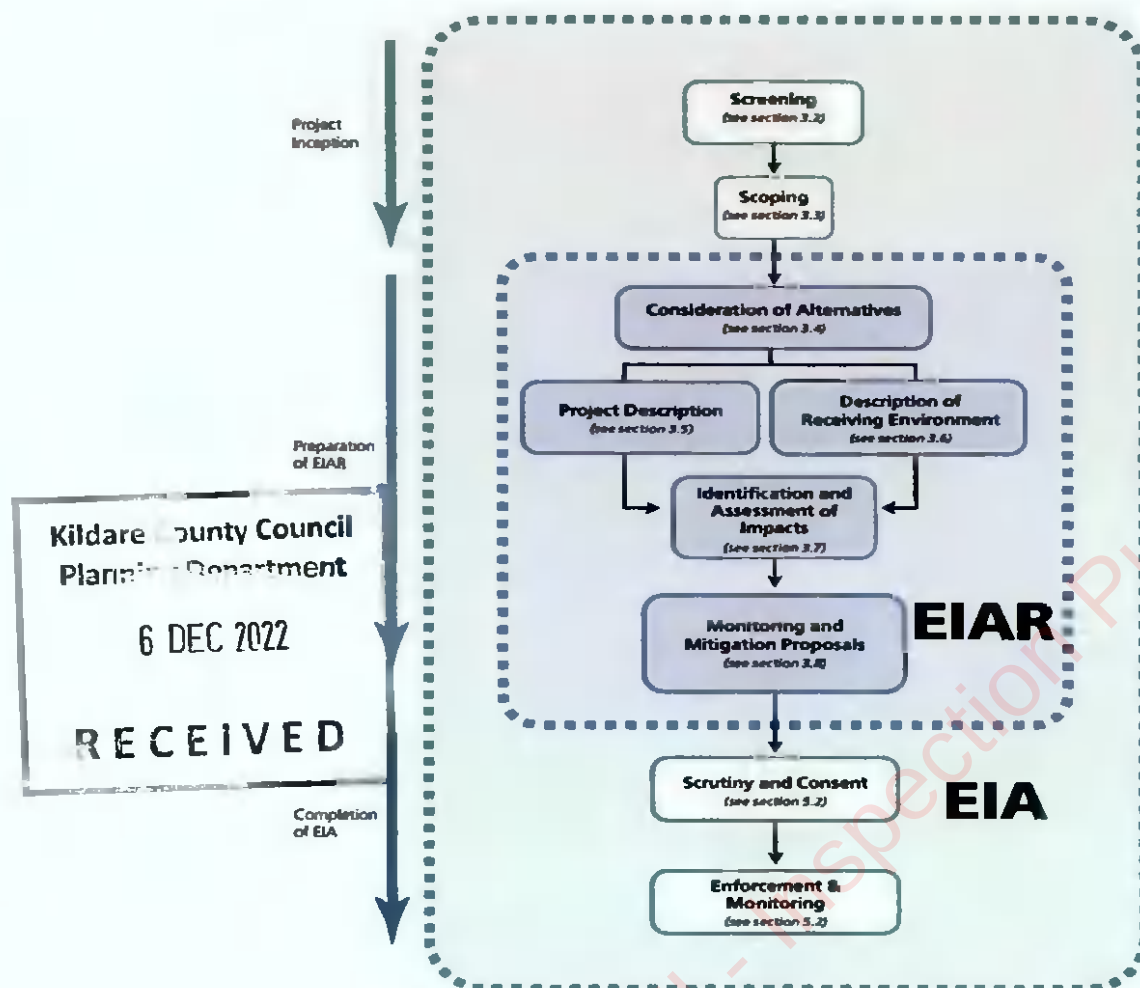


Figure 1-1 EIA Process

The purpose of the EIAR is to provide the Planning Authority with information on the likely and significant effects on the environment by the Proposed Development. This EIAR was prepared in parallel with the project design process and reflects the potential cumulative impact of other developments.

1.3 EIA Legislation

The EIA Directive requires EIA to be carried out for certain projects as listed in Annex I of the Directive. The EIA Directive is transposed into Irish law through the Planning and Development Act 2000 (as amended) (the **Planning Act**) and the Planning Regulations.

1.4 EIA Guidelines

This EIAR has been prepared in accordance with all relevant guidance. The documents listed below are common to all Chapters. Additional specific guidelines will be referred to in each specific Chapter.

- Guidelines on the Information to be contained in Environmental Impact Statements (EPA 2002);

- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA 2003);
- Draft Advice Notes for Preparing Environmental Impact Statements (EPA draft September 2015a);
- Draft Revised Guidelines on the Information to be Contained in Environmental Impact Statements (EPA draft September 2015b);
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA May 2022);
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR) (EPA May 2022);
- Environmental Assessments of Plans, Programmes and Projects – Rulings of the Court of Justice of the European Union (European Union 2017);
- Environmental Impact Assessment of Projects – Guidance on Scoping (Directive 2011/92/EU as amended by 2014/52/EU) (European Union 2017);
- Guidance of Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Union 2013);
- Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report (European Union 2017);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Environment, Community and Local Government 2013);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Government of Ireland 2018);
- Key Issues Consultation Paper on the Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems; (Department of Housing, Planning, Community and Local Government 2017);
- Circular PL 05/2018 -Transposition into Planning Law of Directive 2014/52/EU amending Directive 2011/92/EU on the effects of certain public and private projects on the environment (the EIA Directive) And Revised Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government 2018);
- Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (European Communities 1999);
- Implementation of Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (European Communities 2003); and

Effects of certain
plans and programmes on the environment
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- Environmental Impact Assessment Screening; Office of the Public Practice Note (PN02) (June 2021)

The EIA Directive defines EIA as a process. Article 1(2)(g) states that EIA means:

"(i) the preparation of an environmental impact assessment report by the developer, as referred to in Article 5(1) and (2);

(ii) the carrying out of consultations as referred to in Article 6 and, where relevant, Article 7;

(iii) the examination by the competent authority of the information presented in the environmental impact assessment report and any supplementary information provided, where necessary, by the developer in accordance with Article 5(3), and any relevant information received through the consultations under Articles 6 and 7;

(iv) the reasoned conclusion by the competent authority on the significant effects of the project on the environment, taking into account the results of the examination referred to in point;

(iii) and, where appropriate, its own supplementary examination; and

(v) the integration of the competent authority's reasoned conclusion into any of the decisions referred to in Article 8a".

The EIA Directive requires the EIAR to identify, describe and assess, in an appropriate manner and in light of each individual case, the direct, indirect and cumulative significant effects of the Proposed Development on factors of the environment including:

- a) Population and human health
- b) Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC (respectively, the Habitats Directive and the Birds Directive)
- c) Land, soil, water, air, and climate
- d) Material assets, cultural heritage, and the landscape
- e) The interaction between the factors referred to in points (a) to (d)

1.5 Screening for EIA

'Screening' is the term used to describe the process for determining whether a proposed development requires an EIA by reference to mandatory legislative threshold requirements or in the case of sub threshold development, by reference to the type and scale of the proposed development and the significance or the environmental sensitivity of the receiving baseline environment.

Annex 1 of the EIA Directive requires as mandatory an EIA for all development projects listed therein.

Schedule 5, Part 1, of the Planning Regulations transposes Annex 1 of the EIA Directive directly into Irish planning legislation. An EIAR is required to accompany a planning application for development of a class set out in Schedule 5, Part 1 of the Planning Regulations which exceeds a limit, quantity or threshold set for that class of development.

Schedule 5, Part 2 of the Planning Regulations defines projects that are assessed on the basis of set mandatory thresholds for each of the project classes including:

"Schedule 5, Part 2 - Infrastructure projects

11(b) Installations for the disposal of waste with an annual intake greater than 25,000 tonnes not included in Part 1 of this Schedule.

The lifespan of the Proposed Development will be 5 years with a total infill volume of 128,461 tonnes (Fill area 1: 103,456 tonnes, Fill area 2: 25,005 tonnes). This equates to approximately 25,700 tonnes annually. The Proposed Development requires a mandatory EIA due to the intake being more than the threshold of 25,000 tonnes.

1.6 Scope of the EIAR

'Scoping' is a process of deciding what information should be contained in an EIAR and what methods should be used to gather and assess that information. It is defined in EC Guidance on EIA Scoping 2001¹ as:

'Determining the content and extent of the matters which should be covered in the environmental information to be submitted in the EIAR'

The content of this EIAR was informed by a scoping process carried out by the applicant, design team and EIAR consultants to identify the core issues likely to be most important during the EIA process.

The EIAR prepared for the Proposed Development has endeavoured to be as thorough as possible and therefore all of the issues listed in Schedule 6, Sections 1 and 2 of the Planning Regulations have been addressed in the EIAR.

The scope of this EIAR has had regard to the documents listed in Section 1.4, together with:

- The requirements of Part X of the Planning Act and also Part 10 of the Planning Regulations;
- The requirements of the Kildare County Development Plan 2017-2023;
- Relevant Regional and National Planning Policy Documents;

¹ Guidance on EIA Scoping European Commission June 2001

- The receiving environment and any vulnerable or sensitive local features and current uses;
- Previous relevant planning history and applications that have been submitted on the subject and adjoining lands;
- The likely and significant impacts of the Proposed Development on the environment; and
- Available mitigation measures for reducing or eliminating any potentially significant undesirable impacts.

In addition, the individual Chapters of this EIAR should be referred to for further information on the documents consulted by each individual consultant.

1.7 Purpose and Objectives of the EIAR

The purpose of this EIAR is to assist in the EIA process, by identifying likely significant environmental impacts resulting from the Proposed Development, to describe the means and extent by which they can be reduced or mitigated, to interpret and communicate information about the likely impacts and to provide an input into the decision making and planning process.

The fundamental principles to be followed when preparing an EIAR are:

- Anticipating, avoiding, and reducing significant effects;
- Assessing and pursuing preventative action;
- Maintaining objectivity;
- Ensuring clarity and quality;
- Providing relevant information to decision makers; and
- Facilitating public and stakeholder consultation.

EIA is an iterative process. The EIAR captures this assessment process and describes its outcomes. The EIAR documents the consideration of environmental effects and provides transparent, objective, and replicable documentary evidence of the EIA evaluation and decision-making processes.

The EIAR provides information on any identified effects arising as a consequence of the Proposed Development and which:

- Are environmentally based;
- Are likely to occur; and
- Have significant and adverse effects on the environment.

It also documents how the design of the Proposed Development incorporates measures for the purposes of impact avoidance, reduction, or amelioration; as well as to explain how significant adverse effects will be avoided.

The key objective of this EIAR is to inform the Planning Authority on the acceptability of the Proposed Development, in carrying out an EIA, in order to reach a decision in the full knowledge of the Proposed Development's likely significant impacts on the environment, if any.

1.8 Format and Structure of this EIAR

The formation of an EIAR necessitates the co-ordination and collation of associated, yet diverse specialised areas of assessment. The EIA approach involves the examination of each environmental factor, describing the existing baseline environment, the Proposed Development, its likely impacts and direct and indirect significant effects pertaining to that environmental factor and mitigation measures, where appropriate.

The topics examined in this EIAR are categorised under the environmental factors prescribed under the EIA Directive:

- Population and Human Health
- Biodiversity
- Land & Soils
- Water
- Air
- Climate
- Material Assets
- Cultural Heritage
- Landscape

The expected effects deriving from the vulnerability of the Proposed Development to risks of major accidents and/or disasters must also be examined.

The structure of the EIAR is set out in Table 1-1.

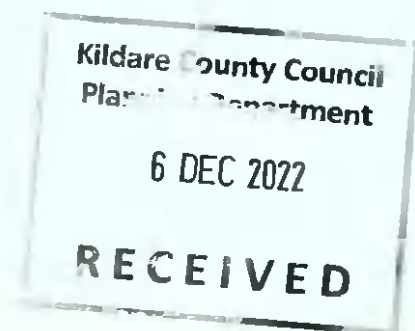


Table 1-1 Structure of the EIAR

Chapter	Title	Content
1	Introduction and Methodology	Chapter 1 sets out the purpose, methodology and scope of the document.
2	Description of the Proposed Development & Assessment of Alternatives	As required under Article 5(1)(a) of the EIA Directive 2014/52/EU (subsequently referred to as the Directive), Chapter 2 provides a description of the Site, design and scale of Proposed Development, and as required under Article 5(d), an evaluation of the reasonable alternative design approaches.
3	Planning and Development Context	Chapter 3 sets the National, Regional, and Local policy framework for the Proposed Development.
4	Population and Human Health	Chapter 4 covers the requirement for assessment on potentially significant effects to population and human health as required under Article 3(1)(a) of the Directive.
5	Biodiversity	Chapter 5 covers the requirement of Article 3(1)(b) of the Directive to assess potentially significant effects on biodiversity (which previously referred only to 'fauna and flora'), having particular attention to species and habitats protected under the Habitats Directive and the Birds Directive.
6	Land and Soils	Chapter 6 covers the requirement under Article 3(1)(c) of the Directive on Land and Soil to assess the type of soil and geology in the area of the Proposed Development and identifies any potentially significant effects.
7	Hydrology	Chapter 7 covers the requirement under Article 3(1)(c) of the Directive to assess potentially significant effects to water quality arising from the Proposed Development. This Chapter will assess any potential effects from pollution and discharges to surface water.
8	Air Quality and Climate	Chapter 8 covers the requirement under Article 3(1)(c) of the Directive on Air and Climate to assess potentially significant effects to air quality in the surrounding environment.
9	Noise and Vibration	Chapter 9 covers the requirement to assess potentially significant effects from airborne noise and vibration as required under Article 3(1)(a) of the Directive on Human Health.
10	Landscape and Visual Amenity	Chapter 10 covers the requirement under Article 3(1)(d) of the Directive to assess potentially significant effects on the landscape. This Chapter will assess any potential visual impacts to landscape caused by the Proposed Development.
11	Archaeology and Cultural Heritage	Chapter 11 covers the requirement under Article 3(1)(d) of the Directive to assess potentially significant effects on cultural heritage.
12	Material Assets, Traffic, Utilities and Waste Management	Chapter 12 covers the requirement under Article 3(1)(d) of the Directive to assess potentially significant effects on material assets. This Chapter will identify impacts to existing utilities and

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Chapter	Title	Content
		infrastructure from the development of the Proposed Development. Article 5(1), Annex IV, point 1(d) of the Directive requires estimates of quantities and types of waste produced during construction and operation phase. Chapter 12 will also present an assessment of how resources and waste will be managed for the Proposed Development.
13	Risk Management	Chapter 13 covers the requirement under Article 3(2) of the Directive to include the expected effects deriving from the vulnerability of the Proposed Development to risks of major accidents and/or disasters.
14	Interactions	As required under Article 3(1)(e) of the Directive, Chapter 14 provides an assessment of the interaction between all of the environmental aspects referred to in this EIAR.
15	Mitigation and Monitoring	Chapter 15 describes mitigation and monitoring as required under Article 5(1) of the Directive in order to avoid, prevent, reduce, or if possible, offset any identified significant adverse effects on the environment and, where appropriate, describes any proposed monitoring arrangements.

1.9 Methodology Used to Produce this EIAR

The methodology employed to produce this EIAR is detailed in Table 1-2. The objective is to evaluate each environmental topic, both individually and collectively, in a systematic and objective manner.

The methodology will outline the methods used to describe the baseline environmental conditions as well as predict the likely impacts on the environment of the Proposed Development. The data and survey requirements for each Chapter will vary depending on the environmental topic and will be chosen by the particular specialist based on relevant legislation, best practice guidance, policy requirements, and professional judgement. Similarly, the study area is also defined for each environmental topic based on professional judgement and experience.

All environmental topics require desktop reviews of all relevant data at a minimum. These desktop studies are then supplemented by field studies and consultations with relevant stakeholders, for example interested parties, statutory bodies, and local authorities, as required for each environmental topic.

An outline of the methodology employed consistently in each Chapter of the EIAR to examine each environmental topic is provided in Table 1-2:



Table 1-2 Methodology Employed to Produce each EIAR Chapter

Introduction	Provides an overview of the specialist area and specifies the specialist who prepared the assessment.
Study Methodology	This subsection outlines the method by which the relevant impact assessment has been conducted within that Chapter.
The Existing Receiving Environment (Baseline Situation)	This section will describe and assess the receiving environment, the context, character, significance, and sensitivity of the baseline receiving environment into which the Proposed Development will fit. This analysis also takes account of any other proposed developments that are likely to proceed in the immediate surroundings.
Characteristics of the Proposed Development	Consideration of the 'Characteristics of the Proposed Development' allows for a projection of the 'level of impact' on any particular aspect of the environment that could arise. For each Chapter those characteristics of the Proposed Development which are relevant to the area of study are described; for example, the Chapter on landscape and visual impact addresses issues such as height, design and impact on the surrounding landscape.
Potential Impact of the Proposed Development	This section provides a description of the specific, direct and indirect, effects that the Proposed Development may have. This analysis is provided with reference to both the Existing Receiving Environment and Characteristics of the Proposed Development sections, while also referring to the: (i) magnitude and intensity, (ii) integrity, (iii) duration and (iv) probability of impacts. The assessment addresses whether the impacts are direct, indirect, secondary or cumulative in nature. It also looks at the timescale of such impacts e.g. are they short, medium, long-term, and are they of a temporary, permanent, continuous or intermittent nature, and are they positive or negative impacts. The impact interactions are also addressed.
Do Nothing Impact	In order to provide a qualitative and equitable assessment of the Proposed Development, this section considers the Proposed Development in the context of the likely impacts upon the receiving environment should the Proposed Development not take place.
Avoidance, Remedial and Mitigation Measures	This section of each Chapter describes the mitigation measures which are required. The requirement to describe mitigation measures is laid out in the EIA Directive, as implemented by the Planning Act and the Planning Regulations. Avoidance, remedial and mitigation measures describe any corrective or mitigative measures that are either practicable or reasonable, having regard to the potential impacts of the Proposed Development. This includes avoidance, reduction and remedy measures as set out in Section 4.7 of the Development Management Guidelines 2007, to reduce or eliminate any significant adverse impacts identified.
Residual Impacts of the Proposed Development	This section allows for a qualitative description of the resultant specific direct, indirect, secondary, cumulative, short, medium and long-term, temporary, permanent, continuous, or intermittent, positive and negative effects as well as impact interactions which the Proposed Development may have, assuming all mitigation measures are fully and successfully applied.
Monitoring	This involves a description of monitoring in a post-development phase, if required. This section addresses the effects that require monitoring, along with the methods and the agencies that are responsible for such monitoring.

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Reinstatement	While not applicable to every aspect of the environment considered within the EIAR, certain measures may need to be proposed to ensure that in the event of the proposal being discontinued, there will be minimal impact to the environment.
Interactions	This section provides a description of impact interactions together with potential indirect, secondary and cumulative impacts.
Difficulties Encountered in Compiling Information	The EIA Directive requires that the EIAR includes 'details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information, and the main uncertainties involved' (EIA Directive, Annex IV, Part 6). Each Chapter that contains an environmental baseline and assessment contains a section outlining any difficulties encountered in compiling that Chapter.

1.10 EIAR Project Team

Table 1-3 EIAR Project Team

Chapter	Consultant Name and address	Specialist Area
1.0 Introduction and Methodology including Non-Technical Summary	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Louise Hewitt	Multidisciplinary Environmental Consultants
2.0 Project Description and Alternatives Examined	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Nikita Coulter	Multidisciplinary Environmental Consultants
3.0 Planning & Policy Context	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Maireed Foran	Multidisciplinary Environmental Consultants
4.0 Population and Human Health	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Louise Hewitt	Multidisciplinary Environmental Consultants
5.0 Biodiversity	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Dr. Sanni Hintikka	Multidisciplinary Environmental Consultants
6.0 Land and Soils	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Gareth Carroll	Multidisciplinary Environmental Consultants
7.0 Hydrology & Water	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Gareth Carroll	Multidisciplinary Environmental Consultants

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Chapter	Consultant Name and address	Specialist Area
8.0 Air Quality & Climate	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Laura Griffin	Multidisciplinary Environmental Consultants
9.0 Noise and Vibration	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Laura Griffin	Multidisciplinary Environmental Consultants
10.0 Landscape & Visual Amenity	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Nuno Costa	Multidisciplinary Environmental Consultants
11.0 Archaeology, Architectural, and Cultural Heritage	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Louise Hewitt and Laura Griffin	Multidisciplinary Environmental Consultants
12.0 Material Assets: Traffic, Waste, and Utilities	Transport Insights Suite 30, 21 Baggot Street Lower, Dublin 2, D02 X658 Sean Byron and Eoin Munn Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Nikita Coulter	Traffic Planning Consultancy Multidisciplinary Environmental Consultants
13.0 Risk Management	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Nikita Coulter	Multidisciplinary Environmental Consultants
14.0 Interactions	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Arthur Greene	Multidisciplinary Environmental Consultants
15.0 Mitigation and Monitoring Measures	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Arthur Greene	Multidisciplinary Environmental Consultants

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1.11 Non-Technical Summary

A Non-Technical Summary of the EIAR has also been prepared. The EIA Directive states that one of the objectives of the EIA process is to ensure that the public are fully aware of the environmental implications of any decisions. EPA Guidelines note that the non-technical summary of the EIAR should facilitate the dissemination of the information contained in the EIAR and that the core objective is to ensure that the public is made as fully aware as possible of the likely environmental impacts of projects prior to a decision being made by An Bord

Pleanála. A Non-Technical Summary of the EIAR has therefore been prepared which summarises the key environmental impacts and is provided as a separately bound document.

1.12 Links between EIAR and Appropriate Assessment

A Screening Report for Appropriate Assessment (AA) has been carried out for the Proposed Development to determine if there is a risk of effects to any Natura 2000 site. As the AA screening screened out potential impacts on any Natura 2000 sites, a full Natura Impact Statement (NIS) was not required.

While AA is required by the proposer of any plan or project likely to have an adverse effect on a Natura 2000 site, EIA is required for projects listed in Annex I of the EIA Directive. The requirement for EIA relative to projects listed in Annex II of the EIA Directive is determined on a case by case. While these two different types of assessment are independent and are required by separate legislation, namely the Birds and Habitat Directives (i.e. AA) and the EIA Directive (i.e. EIAR) there is a degree of overlap, particularly in the Biodiversity Chapter of the EIAR.

1.13 Availability of EIAR Documents.

A copy of this EIAR document and Non-Technical Summary is available for purchase at the offices of Kildare County Council at a fee not exceeding the reasonable cost of reproducing the document.

1.14 Statement of Difficulties Encountered

No exceptional difficulties were experienced in compiling the necessary information for the Proposed Development. Where any specific difficulties were encountered these are outlined in the relevant Chapter of the EIAR.

1.15 Quotations

The application is also accompanied by a Non-Technical Summary of the EIAR, which is laid out in a similar, but condensed format to the main EIAR. The structure, presentation, and the Non-Technical Summary of the EIAR, as well as the arrangements for public access, all facilitate the dissemination of the information contained in the EIAR. The core objective is to ensure that the public and local community are aware of the likely environmental impacts of the Proposed Development prior to the granting of consent.

However, it is important to acknowledge that the EIAR by its nature contains statements about the Proposed Development, some of which are positive and some less than positive. Selective quotation or quotations out of context can give a very misleading impression of the findings of the study. Therefore, the study team urge that quotations should, where reasonably possible, be taken from the conclusions of specialists' sections or from the Non-Technical Summary and not selectively.



2 PROJECT DESCRIPTION & DESCRIPTION OF ALTERNATIVES

2.1 Introduction and Terms of Reference

This Chapter provides a detailed description of the Proposed Development together with details of the existing environment. In accordance with Article 5(1)(a) of the EIA Directive, the description of the project should comprise:

'...information on the site, design, size and other relevant features of the project'.

A description of the Proposed Development and its surroundings is provided in this Chapter, together with the proposed design parameters. This description sets the basis against which the specialist assessments presented in this EIAR have been undertaken.

The EIAR must contain information in relation to the environmental impact of both the Proposed Development and all other "reasonable" alternatives studied. An indication of the main reasons for the option chosen must be given, taking into account the effects of the Proposed Development on the environment.

This Chapter was prepared by Enviroguide Senior Environmental Consultant Nikita Coulter. Nikita Coulter has a B.Sc. in Zoology (Hons) from University College Dublin, an M.Sc in Biodiversity and Conservation and a Postgraduate Diploma in Environmental Engineering from Trinity College Dublin, and a NEBOSH accredited International Diploma in Environmental Risk Management. Nikita has 8 years professional experience as an Environmental Compliance Specialist.

2.2 Site Location and Description

The Proposed Development is situated in the Townland of Thomastown in the Barony of Carbury, in the Electoral Division of Cadamstown, Co. Kildare

The Proposed Development will be accessed via the existing entrance point from the L1522.

Johnstown Bridge village is located ca. 1.7km to the east of the site and the village of Kilshanroe is 1.9 km to the south-west. The setting is predominantly rural with surrounding land uses of agriculture, forestry and a number of one-off residential dwellings and one-off commercial type facilities. The site is located approximately 2.5km from junction 9 on the M4 motorway.

The Proposed Development has a total area, including the access road, of 7.243 hectares (ha) (17.898 acres).

2.3 Site History / Background

The landholding is in a rural location and is owned by the Applicant. In the early 2000's the lands in the eastern and central regions of the site were quarried. Once quarrying activities ceased a pond developed in the centre of the site and vegetation began recolonising the site. In its present state, the land is undeveloped and is of marginal agricultural use in that the site

is too soft during winter months to support grazing animals. In addition to the pond in the centre of the site, standing pools of water are found at the northern and southern edges of the site.

2.3.1 Site Planning History

Planning Application Reference - 06/2199

Change of use of a sand & gravel pit to agricultural lands with a total site area of 7.65ha.

Decision: Refused Permission - 09 November 2007

2.4 Project Overview

The Proposed Development comprises the importation of material to in-fill and re-contour a site which was previously quarried. The Applicant proposes, subject to the grant of permission, to import clean greenfield soil, subsoil and stone to remediate approximately 3.689ha of the total site. The 3.689ha is divided into two distinct areas – Area 1 is 2.718ha and Area 2 is 0.971ha. A fill plan has been drawn up for the importation of 68,970m³ of soil to fill Area 1, and 16,670m³ to fill Area 2, equating to a total of 85,640m³ (ca. 128,460 tonnes) of soil and subsoil. A volume to weight conversion factor of 1.50 is taken from the Waste Management (Landfill Levy) Regulations, 2008, SI 199 of 2008. The surface layer will comprise of 300mm of topsoil which will be graded to an even surface finish. It is proposed even out the levels of the site in order to allow for the safety of grazing animals. Once the importation is complete the Applicant will seed the land in line with Teagasc guidelines and return it to agricultural use. The proposed new levels and fill plan are detailed in Drawings P-01 to P-07 prepared by Enviroguide Consulting, 2022 (refer to Appendix A).

Once planning permission is obtained, it is intended to apply to Kildare County Council for a Waste Facility Permit. Material will be accepted in accordance with the conditions of the permit. As part of the Environmental Management Plan a register of incoming materials for the site will be maintained at all times. The only List of Waste (LoW) code accepted on site will be 17 05 04 - *Soil and Stones other than those mentioned in 17 05 03*.

It is proposed to accept material onto the site from 08.00 until 18.00 Monday to Friday and 08.00 to 14.00 on Saturday. It is not proposed to operate on Sundays or Bank Holidays.

Temporary welfare facilities will be located in the northeast of the site as per Figure 2-2, Site Layout Plan and harvested rainwater will be used in the wheel wash or for dust suppression.

Soil will be imported using Heavy Goods Vehicles from contractors authorised to transport waste, coming from a known source which has previously been inspected. In the interest of maintaining quality of incoming material the number of contractors delivering material to the site will be limited to a single contractor. Prior to deposition the consignment note for each load will be inspected by the site supervisor to ensure that the material is acceptable, and each load will be evaluated in accordance with the site's waste acceptance procedure.

The site has the potential to import inert soil and stones for land improvement for agriculture uses and will also improve drainage. As the site elevations decrease from across the site, with the most acute declines located to the north, it is proposed to raise the northern, central and southern sections of the site to come in line with the boundary elevations, refer to *Environmental Management Plan*.

P-04 and P-05 for elevations. The proposed plant will consist of a tracked bulldozer for placing the soil and compressing it to a compaction level that will permit good drainage. An excavator may be brought on to site from time to time to construct internal haul roads.

Thus, the focus of the proposed filling is concentrated in the central and eastern areas of the site. Cut and fill cross sections for the Proposed Development are attached (refer to drawings included as Appendix A). Details of existing ground level, proposed change in elevation and final fill level are detailed in Drawings P-01 to P-07. It is proposed to carry this work out over a 5-year period, subject to the availability of appropriate soil, to allow the soil to settle naturally with minimal compaction. The soil and subsoils will be mixed, to minimise compaction and improve drainage.

Filling operations will be confined to a selected area of the site at any one time with each area being restored in a timely manner from commencement of the next phase. The proposed new levels and fill plan are detailed in Drawings P-01 to P-07 prepared by Enviroguide Consulting, 2022 (refer to Appendix A).

A 10-meter buffer and silt fence will be maintained along the eastern boundaries of the site where no soil importation will take place to protect surface waters thus ensuring that there are no offsite nuisances created by the site activity.

The re-profiling of the surface will be carried out to allow for the planting of native grassland as recommended by Teagasc. The re-profiling works will be supervised by a qualified landscape architect to ensure that the filling is carried out in a manner that will derive maximum benefit from this.



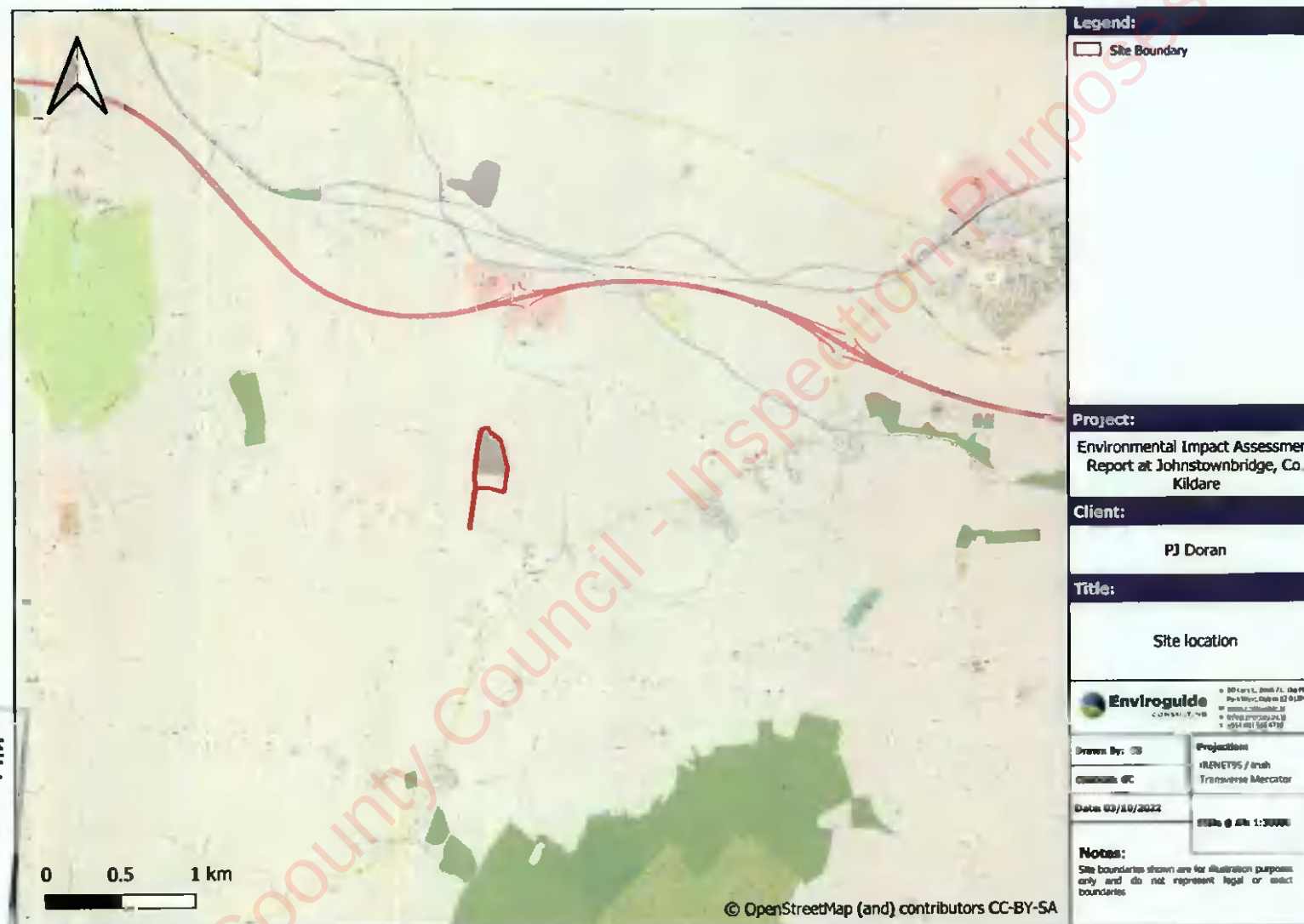


Figure 2-1: Location of the Proposed Development



ENVIROGUIDE
info@enviroguide.ie
PHONE:
+353 (0) 8866730
WWW:
www.enviroguide.ie

Johnstown Bridge
DRAWING TITLE:
Proposed Site Layout
DEPARTMENT: Engineering
DRAWING STATUS: Planning

CLIENT:
PJ Doran
LOCATION:
Johnstown Bridge,
Clonsilla, Co. Kildare

DRAWN BY: CHS/CHS
SP: CHS
DRAWING NO.: 0036
D: 07
SCALE: 1:1000
DATE: 07/2/2022
A1

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Figure 2-2: Proposed Site Layout Plan

2.5 Statutory Planning Context

The site of the Proposed Development is subject to National, Regional and Local level planning policy. The following outlines the key planning policy documents of relevance to the Proposed Development.

2.5.1 National

- The National Development Plan 2021-2030
- The National Planning Framework: Project Ireland 2040
- EU Waste Framework Directive and European Community (Waste Directive) Regulations 2011
- Climate Action Plan 2019
- A Waste Action Plan for a Circular Economy – Ireland's National Waste Policy 2020-2025
- Construction & Demolition Waste Soil and Stone Recovery / Disposal Capacity Report

2.5.2 Regional

- Eastern & Midland Regional Assembly. Regional Spatial & Economic Strategy 2019-2031

2.5.3 Local

- Kildare County Development Plan 2017-2023 and Draft Kildare County Development Plan 2023-2029

Chapter 3, Planning and Policy Context, of this EIAR addresses in detail the policies and objectives contained in the aforementioned plans/policies that are relevant to the Proposed Development.

2.6 Description of Alternatives

2.6.1 Introduction

Consideration of reasonable alternatives is an important aspect of the EIA process and is necessary to evaluate the likely environmental consequences of a range of development strategies for the site of the Proposed Development within the constraints imposed by environmental and planning conditions. This section provides a description of the reasonable alternatives that have been considered.

Article 5 of the EIA Directive requires that that the EIAR contain:

"A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the Proposed Development and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects."

This section of the EIAR provides an explanation of the reasonable alternatives examined throughout the design and consultation process. This serves to indicate the main reasons for choosing the Proposed Development, taking into account and providing a comparison of the environmental effects. The alternatives may be described at four levels:

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- Alternative locations
- Alternative designs
- Alternative layouts
- Alternative processes

Pursuant to Section 3.4.1 of the Environmental Protection Agency (EPA) *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2022), the consideration of alternatives also needs to be cognisant of the fact that *"in some instances some of the alternatives described below will not be applicable - e.g. there may be no relevant 'alternative location... but there may be alternative design options.'*

In accordance with EPA Guidelines (EPA, 2022), different types of alternatives may be considered at several key phases during the process. As environmental issues emerge during the preparation of the EIAR, alternative designs may need to be considered early on in the process or alternative mitigation options may need to be considered towards the end of the process.

The EPA Guidelines (EPA, 2022) states:

"The objective is for the developer to present a representative range of the practicable alternatives considered. The alternatives should be described with 'an indication of the main reasons for selecting the chosen option'. It is generally sufficient to provide a broad description of each main alternative and the key issues associated with each, showing how environmental considerations were taken into account in deciding on the selected option. A detailed assessment (or 'mini-EIA') of each alternative is not required."

Thus, the consideration and presentation of the reasonable alternatives studied by the project design team is an important requirement of the EIA process.

2.6.2 Alternative Locations

The Proposed Development is for the remediation of land that is currently of little or no economic or agricultural value. As the land is within the ownership of the Applicant and irrespective of any potential future use it requires remediation.

Having regard to the above, and in accordance with Section 3.4.1 of the EPA Guidelines (2022), it was not considered necessary to consider alternative sites for the Proposed Development.

2.6.3 Alternative Uses

As previously stated, the location of the Proposed Development lies within lands that are prone to unsafe and unusable ground conditions during the winter months. In their current state these lands have little or no value for agriculture, development or biodiversity. They are currently accumulating standing water, waste and invasive plant species. When remediation is complete the land will be returned to agricultural use for the grazing of animals. This approach is considered the most favourable environmental and visual option.

2.6.4 Alternative Design & Layouts

The development proposals for the Site were considered in the context of remediation of the site to ensure that it is suitable for agriculture.

2.6.5 Alternative Process

This is not considered relevant to this EIAR having regard to the nature of the Proposed Development, land remediation.

2.7 The Existence of the Project

The project will commence once appropriate consents have been obtained from both the Planning and Waste competent authorities with the projected remediation of the site being completed within 5 years from the commencement of site operations.

The Proposed Development is a development consisting of land remediation for the purpose of rendering the site suitable for agriculture.

The primary direct significant environmental effects will arise during the infilling of the site. Once graded and re-seeded the Proposed Development will impact positively on the environment by being returned to agricultural land use.

The primary likely significant environmental impacts of the Proposed Development are fully addressed in the relevant specialist Chapters of this EIAR. These impacts relate to Population & Human Health, Land & Soil, Landscape & Visual, Noise and Air Quality & Climate associated with the traffic generated.

The Proposed Development also has the potential for cumulative, secondary and indirect impacts (i.e., traffic) and can be difficult to quantify due to complex inter-relationships.

However, all interactions and cumulative impacts are unlikely to be significant, have been addressed in Chapter 14 (Interactions) and the cumulative impacts are fully addressed in the relevant specialist Chapters of this EIAR.



3 PLANNING AND POLICY

This Chapter of the EIAR gives an overview of the relevant legislation that supports the Proposed Development at a local, regional and national level and sets out the strategic and statutory context governing the planning and development of the Proposed Development and was prepared by Mairéad Foran. Mairéad Foran has a B.A. (Moderatorship) in Environmental Sciences from Trinity College Dublin, and an Advanced Diploma in Planning and Environmental Law from King's Inns College, Dublin. Mairéad has 4 years professional experience as an Environmental Consultant and has experience working on a large number of EIARs and EIA Screening Reports for projects of a similar scale to that of the Proposed Development.

The Proposed Development comprises the importation of material to in-fill and re-contour the site. The total site area is 7.243ha. It comprises of the importation of soil and subsoil from clean greenfield development sites. The Applicant proposes, subject to the grant of permission, to import clean greenfield soil and stone to remediate approximately 3.689ha of the total site. Fill area 1 has an area of 2.718ha. Fill Area 2 has an area of 0.971ha.

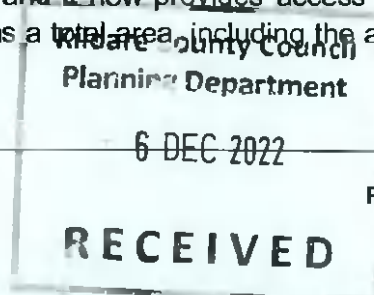
A fill plan has been drawn up for the importation of 68,970m³ of soil to fill Area 1, and 16,670m³ to fill Area 2, equating to a total of 85,640m³ (ca. 128,460.5 tonnes) of soil and subsoil. A volume to weight conversion factor of 1.50 is taken from the Waste Management (Landfill Levy) Regulations, 2008, SI 199 of 2008. The surface layer will comprise of 300mm of topsoil which will be graded to an even surface finish.

It is proposed even out the levels of the site in order to allow for the safety of grazing animals. Once the importation is complete the Applicant will seed the land in line with Teagasc guidelines and return it to agricultural use. The Operational Phase will see the Site being used as agricultural pastureland.

Once planning permission is obtained, it is intended to apply to Kildare County Council for a Waste Facility Permit. Material will be accepted in accordance with the conditions of the permit. As part of the Environmental Management Plan a register of incoming materials for the site will be maintained at all times. The only List of Waste (LoW) code accepted on site will be 17 05 04 - *Soil and Stones other than those mentioned in 17 05 03*.

The following sections describe how the Proposed Development complies with the stated and statutory requirements of Kildare County Council (KCC) with respect to planning and sustainable development. The relevant local planning policy with which the Proposed Development complies primarily comprises the Kildare County Development Plan 2017-2023 and the Draft Kildare County Development Plan 2023 – 2029.

The Proposed Development is located 1.7km west from Johnstownbridge. Johnstownbridge is situated in the northwest of the county 40km from Naas, close to the boundary with County Meath and just south of the M4 Dublin to Sligo Motorway. Johnstownbridge acts as a local service centre for its inhabitants and the surrounding rural area. The entrance to the Site is located along an un-named local road off the R402. The site entrance was originally a local road until it was blocked off by Kildare County Council and it now provides access to the owner's house and farm. The Proposed Development has a total area, including the access road, of 7.243ha.



Johnstownbridge is classified as a "Village" according to the Settlement Hierarchy Map for the Kildare County Development Plan 2017-2023. In the Draft County Development Plan 2023-2029, it is identified as a "Self-Sustaining Growth Town" in the Settlement Hierarchy Map. The Proposed Development Site lies beyond any zoned land in the Johnstownbridge zoned land map.

The Proposed Development is located 1.2km west from the zoned land within this Development Plan. However, it still complies with the Village Plan Principles as set out within the existing Development Plan such as:

(iv) Protect and enhance the physical and natural environment in terms of its recreational and ecological potential.

In addition, the Proposed Development will be in accordance with Objective EM1 "Facilitate the expansion of existing local services and businesses where appropriate and to facilitate the development of further local employment opportunities in accordance with the proper planning", as outlined in the existing Employment Development Objectives in the existing Development Plan. In addition, the Proposed Development is keeping in principle with Village Plans and Rural Settlement Policy VRS 5:

Develop lands in both the villages and settlements sequentially and generally in accordance with the following:

- Development will be encouraged from the centre outwards with undeveloped lands closest to the village centre being given first priority; and*
- The development of 'infill' sites and lands with opportunities for brownfield/ regeneration will be encouraged.*

The Proposed Development is consistent with the European policy on waste (Waste Framework Directive) and national policy (the Regional Waste Management Plan for the area) as it will provide for the sustainable use of inert soil and stone material for infilling activity.

3.1 National and Regional Planning Policy Context

3.1.1 National Planning Context

3.1.1.1 National Framework Plan

The *Project Ireland 2040: National Planning Framework* (NPF), published on 16th February 2018, replaces the previous National Spatial Strategy. It is the Government's high-level strategic plan for shaping the future growth of the country to the year 2040. It will guide public and private investment and create and promote opportunities for people, and to protect and enhance the environment. The companion to this document is the National Development Plan (NDP), a ten-year strategy for public capital investment of almost €116 Billion.

The NPF outlines key future planning and development place making policies for the Eastern and Midland Regions and outlines the National Strategic Outcomes and Priorities of the National Development Plan. These include the following:

- Compact Growth;
- Enhanced Regional Accessibility;
- Strengthened Rural Economies and Communities;
- High-Quality International Connectivity;
- Sustainable Mobility;
- A Strong Economy, supported by Enterprise, Innovation and Skills;
- Enhanced Amenities and Heritage;
- Transition to a Low Carbon and Climate Resilient Society;
- Sustainable Management of Water, Waste, and other Environmental Resources;
and
- Access to Quality Childcare, Education and Health Services.

The Proposed Development will assist in meeting and achieving these shared set of goals, as set out in the Plan. A Strategic Outcome of particular note in the context of the Proposed Development includes:

- **National Strategic Outcome 9**

Sustainable Management of Water, Waste, and other Environmental Resources:

Ireland has abundant natural and environmental resources such as our water sources that are critical to our environmental and economic wellbeing into the future. Conserving and enhancing the quality of these resources will also become more important in a crowded and competitive world as well as our capacity to create beneficial uses from products previously considered as waste, creating circular economic benefits.

Waste planning in Ireland is primarily informed by national waste management policies and regional waste management plans. Planning for waste treatment requirements to 2040 will require *"Adequate capacity and systems to manage waste, including municipal and construction and demolition waste in an environmentally safe and sustainable manner and remediation of waste sites to mitigate appropriately the risk to environmental and human health."*

In addressing the environmental challenges, and in support of environmental policy at European and national level, the Strategy promotes the aim of Resource Efficiency and Transition to a Low Carbon Economy by:

- Sustainable Land Management and Resource Efficiency - Adopting the principles of the circular economy to enable more sustainable planning and land use management of our natural resources and assets;
- Low Carbon Economy - Our need to accelerate action on climate change;
- Renewable Energy - Our transition to a low carbon energy future; and
- Managing Waste - Adequate capacity and systems to manage waste in an environmentally safe and sustainable manner.

It is predicted that a population increase of around one million people, alongside economic growth to 2040, will increase pressure on waste management capacity. The NPF supports circular economy principles that minimise waste going to landfill and instead focuses on

maximising waste as a resource. This means that prevention, preparation for reuse, recycling and recovery are prioritised over the disposal of waste. The Proposed Development Site is undeveloped and is considered of marginal agricultural use. It will involve the importation of soil and stone waste to in-fill and re-contour the site. Therefore, supporting the circular economy through maximising waste as a resource, ensuring it is re-used to improve the site for agriculture purposes, and improve drainage. The Proposed Development also supports National Policy Objective 53: *"Support the circular and bio economy including in particular through greater efficiency in land management, greater use of renewable resources and by reducing the rate of land use change from urban sprawl and new development."* The NFP states that *"circular economy approach is also applicable to land use management"*. In the same context as the support for *"the reuse of brownfield land over greenfield for new housing"*, it is considered that the Proposed Development is another such example of the circular economy.

The Proposed Development is in line with National Policy Objective 56:

National Policy Objective 56 – *"Sustainably manage waste generation, invest in different types of waste treatment and support circular economy principles, prioritising prevention, reuse, recycling and recovery, to support a healthy environment, economy and society."*

It also supports National Policy Objective 23 and National Policy Objective 24.

National Policy Objective 23 - *"Facilitate the development of the rural economy through supporting a sustainable and economically efficient agricultural and food sector, together with forestry, fishing and aquaculture, energy and extractive industries, the bio-economy and diversification into alternative on-farm and off-farm activities, while at the same time noting the importance of maintaining and protecting the natural landscape and built heritage which are vital to rural tourism."*

National Policy Objective 24 – *"The Department of Rural and Community Development, the Department of Agriculture, Food and the Marine, and other relevant Departments and Agencies will continue to invest in rural Ireland, including through the Rural Regeneration and Development Fund, and will work together to establish a mechanism to co-ordinate structures for funding rural development to align with other national strategies."*

The Proposed Development will assist with the Plan Objectives through both the Construction and Operational Phase activities and is in line with the vision of future proposals within this sector.

3.1.1.2 National Development Plan 2021-2030

The National Development Plan is considered the companion document to the National Planning Framework. Their joint publication as Project Ireland 2040 aims to align our investment strategy with our strategic planning documents with a goal to create a unified and coherent plan for the country, therefore ensuring our investment strategy supports spatial planning behind a shared set of strategic objectives for rural, regional and urban development. In terms of waste management and achieving the National Strategic Outcome (NSO) 9 *Sustainable Management of Water, Waste, and other Environmental Resources*, it states:

"Investment in waste management infrastructure is critical to our environmental and economic well-being for a growing population and to achieving circular economy and climate objectives. Capacity will continue to be built in waste facilities, including anaerobic digestion, hazardous waste treatment, plastics processing, recycling, waste to energy, and landfill and landfill remediation, to meet future waste objectives. The infrastructure to deliver waste management policy has been, to date, largely delivered through private investment with some public sector investment. Significant infrastructure capacity development will be required to separate and process various waste streams at municipal and national levels to achieve new EU legally-binding targets and the additional investment may include a potential role for public investment."

This highlights the role "private investments" have contributed to waste management and recycling, such as that of the Proposed Development.

3.1.2 Environmental Policy

3.1.2.1 EU Waste Framework Directive and European Community (Waste Directive) Regulations 2011

The Waste Framework Directive 2008/98/EC (as amended by Waste Framework Directive 2018/851/EU) was enacted on the 12th December 2010 and introduced new provisions in order to boost waste prevention and recycling as part of the waste hierarchy and clarifies key concepts namely, the definitions of waste, recovery and disposal and establishes a legal framework for the treatment of waste both in Europe and Nationally. The Waste Framework Directive (WFD) made it mandatory for member states to implement a five-step waste hierarchy instead of the outdated six steps and obliges Member States to move towards self-sufficiency. This Directive was transposed into Irish Law by the European Communities (Waste Directive) Regulations 2011, S.I. No. 126 of 2011-2020. The WFD encourages the prevention of waste through recovery, re-use and recycling as outlined in Article 10 and Article 11 of the Directive.

Recycling is defined in the Waste Framework Directive as any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

The Directive also provides a definition on the term recovery in the context of waste:

"...recovery" means any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy."

Section 21(A) of the Waste Management Act has been amended by the European Communities (Waste Directive) Regulations 2011 which updates the waste hierarchy which is represented in Figure 2-1. In order of priority and as shown in Figure 3-1, waste must be reduced, prepared for re-use, recycled/composted, recovered (including energy recovery) or disposed/used for landfill.



Figure 3-1: Waste Hierarchy

Annex II of the Directive further sets out a list of recovery operations numbered R1 to R13. The Proposed Development is considered to fall under the category of R5 primarily and also R10.

This Proposed Development is in line with the new waste hierarchy as it is promoting the recycling and reuse of greenfield soil and subsoil waste, resulting in benefit to agriculture or ecological improvement. It is also diverting materials from disposal to landfill.

3.1.2.2 Climate Action Plan 2021

The Climate Action Plan 2021 sets out a course of actions over the coming years to address the impacts on Ireland's environment, society, economic and natural resources. The Plan outlines the current state of play across key sectors including electricity, transport, built environment, industry and agriculture and charts a course towards ambitious decarbonisation targets.

A detailed sectoral roadmap has been set out, which is designed to deliver a cumulative 51% reduction in greenhouse gas (GHG) emissions, over the period 2021 to 2030.

Sectoral goals and policy roadmaps, vital to the progress and success of achieving cumulative reduction in emissions, over the period 2021 to 2030, include objectives in a range of sectors including Electricity, Buildings, Transport, Agriculture, Enterprise and Services, and Waste and Circular Economy. The Proposed Development will assist in the below objectives for Waste and Circular Economy, as set out in the Action Plan.

Waste and the Circular Economy

- Develop coherent reduction strategies for plastics, food waste, and resource use; and
- Increase the level and the quality of recycling, with less contamination and greater replacement of virgin materials by recycling.

Agriculture

- Deliver expansion of soil management to ensure that carbon abatement from land-use is delivered over the period 2021 to 2030 and in the years beyond.

3.1.2.3 A Waste Action Plan for a Circular Economy – Ireland's National Waste Policy 2020-2025

This document was published by the Department of Environment in 2021 and sets out the National Policy on waste management. The previous national waste policy 'A Resource Opportunity - Waste Management in Ireland' expired in mid-2020. The new plan identifies opportunities for the application of circular economy principles across a range of areas such as food, or end-of-waste and by-products, where improvements in the regulatory regime can divert material from waste to beneficial reuse. The Plan is an action focused plan and is a roadmap for Ireland to embrace the opportunities in becoming a circular economy in the decade ahead, and it is a founding document in achieving the objectives as set out in the EU's new Circular Economy Action Plan (published March 2020) There are three main guiding principles outlined in this Waste Action Plan which are as follows:

- Shift the focus away from waste disposal and treatment to ensure that materials and products remain in productive use for longer thereby preventing waste and supporting reuse through a policy framework that discourages the wasting of resources and rewards circularity;
- Make producers who manufacture and sell disposable goods for profit environmentally accountable for the products they place on the market; and
- Ensure that measures support sustainable economic models (for example by supporting the use of recycled over virgin materials).

The policy document sets out a series of measures to achieve optimum results in the transition to a circular economy. The document states that *"despite the proximity principle which suggests that waste should generally be disposed of as near to its place of origin as possible, we do not have the power to direct waste to particular facilities or even to keep it in Ireland for treatment. Ireland is reliant on exports of municipal, C&D, packaging and other wastes in order to manage the waste we produce – estimated at 9.5 million tonnes in 2020. This leaves the State potentially exposed if there are external shocks to the export market beyond our control. It also means that we are exporting materials, energy and jobs that could be harnessed here."*

The Proposed Development will assist in providing a resource for the importation and deposition of inert subsoil and topsoil for land profiling and re-contouring purposes, therefore helping to further aid the legal obligations associated with the waste hierarchy.

3.1.2.4 Construction & Demolition Waste Soil and Stone Recovery / Disposal Capacity Update Report 2020

The Regional Waste Management Planning Offices (RWMPOs), on behalf of the Eastern – Midlands, Connacht-Ulster and Southern Waste Management Planning Regions, published the *Construction & Demolition Waste Soil and Stone Recovery / Disposal Capacity Report* in order to quantify and analyse national capacity within the market for the management of soil and stone waste arisings based on 2018 data. This report updates the Soil and Stone Recovery / Disposal Capacity report published in 2016. The report delivers a 10-year forecasting exercise predicting the volumes of soil and stone, concrete, and other CDW

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generation. With respect to soil and stone arisings, the report examines the national recovery and disposal outlets i.e. soil recovery facilities, inert landfills and non-hazardous landfills. This allows for the estimation of currently available and future capacity to meet market demand.

The report highlights the increased rates of construction and development experienced in the Country during 2012 to 2018. Soil and stone are considered the largest fraction of CDW waste accounting for approximately 77% of the total quantity. The report collates collated national data on facilities for each of the three Waste Management Regions. This includes Facilities operating under waste licence, Facilities operating under waste facility permit and Facilities operating under certificates of registration. In the Eastern Midlands Region (EMR), the report findings include "106 authorised facilities in the Region for soil and stone acceptance". According to the report, in the EMR:

"The capacity for uncontaminated soil comprises of 2.4m tonnes annual licenced capacity and 1.52m tonnes lifetime capacity provided by permitted and registered sites. This capacity is concentrated in the Greater Dublin Area. This is not surprising as it is the centre of construction activity in the Region and nationally. In other local authorities in the region, capacity supply is lower and needs monitoring. Co-ordination between local authorities on the supply of facilities locally and regionally would be beneficial."

The Proposed Development will benefit the Eastern Midlands Region in terms of soil intake capacity and will provide a valuable licensed facility for the intake of greenfield soil and subsoil wastes, aligning to circular economy principles.

3.2 Regional and Local Planning Context

3.2.1 Regional Waste Management Plan Eastern Midlands Region (2015-2021)

Regional Planning Guidelines (RPGs) were first adopted in March 2004 as a key implementation mechanism of the Government's overall framework for achieving more balanced regional development and more strategic physical and spatial planning. The RPG were developed directly from the Governments 2002 National Spatial Strategy (NSS). The principal function for RPGs is to link national strategic spatial planning policies to the planning process at City and County Council level by co-ordinating the Development Plans through the Regional Planning Guidelines.

Furthermore, the element of transport planning of Kildare's County Council's Development Plan must be consistent with the transport strategy of the National Transport Authority and it must be consistent with the Regional Planning Guidelines for the Greater Dublin Area. Finally, Kildare County Council's Development Plan must have regard to the Development Plans of adjoining authorities. The local authorities adjoining County Kildare are Carlow, Laois, Meath, Offaly, Dublin and Wicklow.

The Proposed Development sits within the Eastern-Midlands Waste Management Region. The Eastern-Midlands Region Waste Management Plan 2015-2021 (DCC 2015), compiled by Dublin City Council on behalf of all local authorities in the Eastern and Midlands Region, commits to a large and varied number of waste management policies, targets and objectives for the region to achieve waste management in a sustainable and viable manner.

The plan contains several general policies and objectives aimed at generally improving waste management in the region. These include:

- Policy A.1 which calls for the region to *'Take measures to ensure the best overall outcome by applying the waste hierarchy to the management of waste streams'* (DCC 2015, p.212).
- Policy A.3 which sets out the need to *'Contribute to the improvement of management performance across all waste streams through the implementation of policy actions and monitor progress towards national targets'* (DCC 2015, p.213).
- Strategic Objective A states that *'The region will implement EU and national waste and related environmental policy, legislation, guidance and codes of practice to improve management of material resources and wastes'* (DCC 2015, p.212).
- Strategic Objective G states that the region is to *'Apply the relevant environmental and planning legislation to waste activities in order to protect the environment, in particular European sites, and human health against adverse impacts of waste generated'* (DCC 2015, p.225).

The Proposed Development will result in the operation of a permitted facility for greenfield soil and subsoil wastes and is in line with the waste management policies, targets and objectives as set out in the Regional Waste Management Plan Eastern Midlands Region (2015-2021) Plan.

3.2.2 Kildare County Development Plan 2017-2023 and Draft Kildare County Development Plan 2023-2029

The Kildare County Council Development Plan is the statutory planning policy document for the County and sets out the policies and objectives for the proper planning and sustainable development of the County from 2017 to 2023. On 11th January 2021, Kildare County Council gave notice of its intention to review the existing Kildare County Development Plan 2017-2023 and to prepare a new County Development Plan for the period 2023-2029. The review will take up to two years and will conclude with the adoption of the Kildare County Development Plan 2023-2029 in 2023. This Draft Development Plan has been reviewed and taken into account in the context of this Chapter.

As demonstrated below the Proposed Development directly supports these policies and will help to achieve the objectives outlined in the Development Plan as follows:

CS 14: *Promote and enhance biodiversity throughout the county.*

ECD 12: *Facilitate the development of agriculture, bloodstock, horticultural and rural related enterprises in the county.*

EO 2: *Work with Irish Water, to support the provision of water, wastewater treatment and waste management facilities to accommodate the future economic growth of the county and to seek to reserve capacity in water services infrastructure for employment generating uses. An additional benefit of this proposed development is that it will provide a much needed outlet for clean greenfield soil during the remediation process.*

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RE 5: Support and facilitate sustainable agriculture, horticulture, forestry, renewable energy and other rural enterprises at suitable locations in the county.

RE 6: Support the restoration, preservation and enhancement of ecosystems dependent on agriculture and forestry.

AG 4: Support agricultural activities which encourage bio-diversity as identified in the County Biodiversity Plan (adopted November 2008) and the National Biodiversity Plan (2010).

The Proposed Development, by improving the site for agricultural use is consistent with all the above policies and objectives. This is further underpinned by the proximity of the facility to a network of road infrastructure and by virtue of the project resulting in a small increase in local employment.

3.2.3 The EIA Directive

The EIA Directive (85/337/EEC) is in force since 1985 and applies to a wide range of defined public and private projects. The EIA Directive was amended in 1997, 2003, 2009, 2011 and 2014 by Directives 97/11/EC; 2003/35/EC, 2009/31/EC, 2011/92/EU and 2014/52/EU. The EIA Directive requires environmental impact assessments to be carried out for certain projects as listed in Annex I of the Directive. The EIA Directive, and amendments, are transposed into Irish law through the Planning and Development Acts 1996 to 2019 in particular S.I. No. 296 of 2018.

Schedule 5, Part 1, of the Planning Regulations transposes Annex 1 of the EIA Directive directly into Irish planning legislation. An EIAR is required to accompany a planning application for development of a class set out in Schedule 5, Part 1 of the Planning Regulations which exceeds a limit, quantity or threshold set for that class of development.

Schedule 5, Part 2 of the Planning Regulations defines projects that are assessed on the basis of set mandatory thresholds for each of the project classes including:

"Schedule 5, Part 2 - Infrastructure projects

11(b) Installations for the disposal of waste with an annual intake greater than 25,000 tonnes not included in Part 1 of this Schedule.

Draft "Guidelines on the Information to be contained in Environmental Impact Assessment Reports" published by the Environmental Protection Agency (EPA) in August 2017 detail the key changes made by the amended 2014 EIA Directive. In August 2018, the Department of Housing, Planning and Local Government published a document entitled 'Guidelines for Planning Authorities and An Bord Pleanála' on carrying out Environmental Impact Assessment." This document has been consulted in the preparation of this EIAR.

In May 2022, the EPA published the Final "Guidelines on the information to be contained in Environmental Impact Assessment Reports". The Guidelines have been updated following the introduction of transposing legislation and are now formally adopted. The preparation of these updated Guidelines has involved extensive consultation. Participants in this consultation included government departments, national agencies, regional and local government, independent statutory bodies, non-governmental organisations, members of the public, developers and bodies representing various professional, industrial and sectoral groups. The

Guidelines emphasise the importance of the methods used in the preparation of an EIAR to ensure that the information presented is adequate and relevant. This document has been used in the preparation of this EIAR.

The Revised EIA Directive defines EIA as a process. Article 1(2) (g) states that EIA means:

"(i) the preparation of an environmental impact assessment report by the developer, as referred to in Article 5(1) and (2);

(ii) the carrying out of consultations as referred to in Article 6 and, where relevant, Article 7;

(iii) the examination by the competent authority of the information presented in the environmental impact assessment report and any supplementary information provided, where necessary, by the developer in accordance with Article 5(3), and any relevant information received through the consultations under Articles 6 and 7;

(iv) the reasoned conclusion by the competent authority on the significant effects of the project on the environment, taking into account the results of the examination referred to in point

(iii) and, where appropriate, its own supplementary examination; and

(v) the integration of the competent authority's reasoned conclusion into any of the decisions referred to in Article 8a".

The Revised EIA Directive requires the EIA to identify, describe and assess, in an appropriate manner and in light of each individual case, the direct and indirect significant effects of the Proposed Development on factors of the environment including:

- (a) Population and Human Health;
- (b) Biodiversity, with particular attention to species and habitats protected under the Habitats and Birds Directives;
- (c) Land, Soil, Water, Air and Climate;
- (d) Material Assets, Cultural Heritage and the Landscape; and
- (e) The Interaction between the factors referred to in points (a) to (d).

The requirements of the Revised EIA Directive in relation to each Chapter are addressed in the EIAR as follows:

- Chapter 2: Description of Development
- Chapter 3: Planning and Policy Context
- Chapter 4: Population and Human Health
- Chapter 5: Biodiversity;
- Chapter 6: Land and Soils;
- Chapter 7: Hydrology;
- Chapter 8: Air Quality and Climate;
- Chapter 9: Noise and Vibration;
- Chapter 10: Landscape and Visual Amenity;
- Chapter 11: Archaeology and Cultural Heritage;
- Chapter 12: Material Assets including Traffic;



- Chapter 13: Risk Management;
- Chapter 14: Interactions;
- Chapter 15: Mitigation and Monitoring Measures.



4 POPULATION AND HUMAN HEALTH

4.1 Introduction

This Chapter of the EIAR provides a description and assessment of the likely impact of the Proposed Development at Johnstown Bridge on Population and Human Health. This Chapter of the EIAR considers the potential effects of the Proposed Development on human beings living, working, and visiting the vicinity of the Site of the Proposed Development. This Chapter details the potential direct and indirect effects of the Proposed Development on population and human health.

Human beings are one of the most significant elements of the environment to be considered therefore any potential impact on the status of humans by a development proposal must be comprehensively addressed. One of the principal concerns in any proposed development is that the local population experiences no reduction in the quality of life as a result of the development on either a permanent or temporary basis. This Chapter also examines the socio-economic impacts of the Proposed Development focusing in particular on pertinent issues such as residential amenity, economic activity, tourism and population levels.

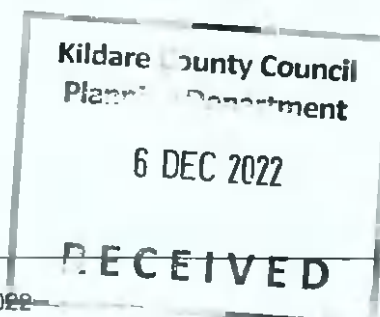
The section on human beings is broad ranging and covers the existence, wellbeing, and activities of people through the format of considering people as 'groups' or 'populations'. The assessment of impacts on human beings involves the identification of relevant key populations that may be affected by the proposal and quantifiable documentary research.

Key populations have been identified as persons residing and engaging in activities in close proximity to the application site, persons with a stake in the general economy of the local and regional area, and persons enjoying the recreational and cultural amenities of the area.

Health, as defined by the World Health Organization (WHO), is "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity". The Healthy Ireland Framework 2013-2025 defines health as *'everyone achieving his or her potential to enjoy complete physical, mental and social wellbeing. Healthy people contribute to the health and quality of the society in which they live, work and play'*. This Framework also states that health is much more than an absence of disease or disability, and that individual health, and the health of a country, affects the quality of everyone's lived experience.

4.1.1 Quality Assurance and Competence

This Chapter was prepared by Louise Hewitt, Environmental Consultants, Enviroguide Consulting. Louise has a Master of Science (Hons) in Environmental Resource Management from University College Dublin and a Bachelor of Science (Hons) in Biology from Maynooth University. Louise has worked as an Environmental Consultant with Enviroguide Consulting since 2021 and has experience preparing Environmental Impact Assessment (EIA) Screening Reports, Introduction, Population and Human Health and Archaeology and Cultural Heritage Chapters of EIARs.



4.2 Study Methodology

A desk-based study was undertaken in September 2022 to assess information regarding population, age structure, economic activity, employment and unemployment within the vicinity of the Proposed Development site.

The 2022 Census of Ireland was held on Sunday the 3rd of April 2022. The preliminary results were released on the 23rd of June 2022 however the main results will be published over several months starting in April 2023. The preliminary 2022 census results have been reviewed however it has been concluded that they do not contain the required region-specific information for the purpose of this assessment of the demographic profile. As such, the more robust and complete 2016 census results have been used in this assessment (Accessed September 2022). The remaining information analysed as part of the desktop study was accessed in September 2022.

The scope of the evaluation is based on a review of data available from the Central Statistics Office (CSO), legislation, guidance documents, EIARs, and on a consideration of the likelihood for significant impacts arising, having regard to the receiving environment and the nature and extent of the Proposed Development. The aim of the study was to assess the positive and negative impacts of the Proposed Development on the socio-economic environment.

The impact of the Proposed Development on the local population is assessed in this EIAR in relation to:

- Population
- Socio Economic impacts
- Tourism and Amenity
- Air quality
- Water
- Noise
- Traffic



4.2.1 Study Area

The Proposed Development is located within the Cadarnstown Electoral Division (ED) which is in the Clane Local Electoral Area (LEA). The Proposed Development is located approximately 2km west of the village of Johnstown Bridge. The nearest town for which population and demographic census data is available is Enfield which is located approximately 3.5km northeast of the Proposed Development. For the purpose of this Chapter, Enfield has been chosen to assess the population and demographic analysis.

4.2.2 Information Sources

The principle sources of information are as follows:

- Census and employment information published by the Central Statistics Office (CSO), Available at <https://data.cso.ie/#>
- Kildare County Development Plan 2017-2023
- Draft Kildare County Development Plan 2023-2029
- Fáilte Ireland published data
- Geological Survey Ireland and

- Ordnance Survey Ireland (OSI) mapping and aerial photography.

The European Commission (EC) has published the "Guidance on The Preparation Of The Environmental Impact Assessment Report" (EC, 2017). This document defines human health as "a very broad factor that would be highly Project dependent. The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air".

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying the quality of effects. See Table 4-1.

Table 4-1 Definition of Quality of Effects

Quality	Definition
Positive Effects	A change which improves the quality of the environment
Neutral Effects	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error
Negative/adverse Effects	A change which reduces the quality of the environment

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying the significance of impacts. See Table 4-2.

Table 4-2 Definition of Significance of Effects

Significance of Effects	Definition
Imperceptible	An effect capable of measurement but without significant consequences.
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effects	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying duration and frequency of effects. See Table 4-3.

Table 4-3 Definition of Duration of Effects

Quality	Definition
Momentary Effects	Effects lasting from seconds to minutes
Brief Effects	Effects lasting less than a day
Temporary Effects	Effects lasting less than a year
Short-term Effects	Effects lasting one to seven years.
Medium-term Effects	Effects lasting seven to fifteen years.
Long-term Effects	Effects lasting fifteen to sixty years
Permanent Effects	Effects lasting over sixty years
Reversible Effects	Effects that can be undone, for example through remediation or restoration

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying the extent and context of effects. See Table 4-4.

Table 4-4: Definition of the Extent and Context of Effects

Quality	Definition
Extent	Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying the probability of effects. See Table 4-5.



Table 4-5: Definition of the Probability of Effects

Quality	Definition
Likely Effects	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.

4.3 The Existing and Receiving Environment (Baseline Situation)

The Proposed Development is situated in Thomastown, Johnstown Bridge, Co. Kildare. The entrance to the Proposed Development is located along an un-named local road just off the R402. Johnstown Bridge village is located approximately 1.7km to the east of the site and the village of Kilshanroe is 1.9 km to the south-west. The setting is predominantly rural with surrounding land uses of agriculture, forestry and a number of one-off residential dwellings and one-off commercial type facilities. The site is located approximately 2.5km from junction 9 on the M4 motorway.

Kildare is situated in the Irish midlands and is located in the province of Leinster. County Kildare is 67.6 km in length and 41.9 km in width, with a total of 169,550 hectares. It is bordered by Counties Carlow, Laois, Meath, Offaly, Dublin and Wicklow. As an inland County, Kildare is generally flat. Its highest points are the foothills of the Wicklow Mountains, the hills north of Kildare town and those to the west at Kilcock.

County Kildare adjoins Dublin to the northeast and this geographical proximity and the strong functional relationship between the two counties results in Kildare being a vital component of the Greater Dublin Area. County Kildare is serviced by a number of major road and rail lines which pass through the County. These include the N4(M4) (from Dublin to Sligo travels along the north of the county by-passing the towns of Leixlip, Maynooth and Kilcock), the M7 (from Dublin to Limerick runs through the County and by-passes the towns of Naas, Newbridge, Kildare and Monasterevin) and the M9 (commences at Kilcullen and ends at Waterford). These roadways connect the Greater Dublin Area with the rest of the country.





Figure 4-1: Site Location





Figure 4-2: Site Layout

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4.3.1 Population and Demographic Analysis

In terms of the County, Region and the State, population structure and change is more strongly influenced by migration and emigration rates than by birth and death rates. The mid to late 1980s in Ireland was a period of heavy population outflow, mainly due to the poor economic and employment situation in the Country at that time. The most recent population estimates published by the Central Statistics Office (CSO) and the Northern Ireland Statistics and Research Agency (NISRA) indicate that despite continuing high levels of emigration, population numbers are still increasing in both Ireland and Northern Ireland.

The most recent population estimates (June 2022) published by the CSO indicate that the combination of a net inward migration and high birth rates have resulted in the population of Ireland exceeding 5 million for the first time since 1851. Population projections for Ireland up to 2046 anticipate a population of approximately five million under the most conservative scenario and over 6.7 million under the most extreme scenario. Population projections for Northern Ireland up to 2034 anticipate a population of approximately two million.

The Greater Dublin Area (GDA), which includes County Kildare, showed a significant population growth of 40.8% between 2016 and 2022. According to Census 2022, the total population of Kildare is 246,977 which represents an 11% increase from the value of 222,504 in 2016 (Table 4-6).

Table 4-6: Population Change in Greater Dublin Area, 2016 to 2022 Census (Source: CSO)

County	Population 2016 Census Data	Preliminary 2022 Census Data	Change in Number of Persons	Percentage change in Population
Dublin	1,347,359	1,450,701	103,342	7.7
Kildare	222,504	246,977	24,473	11.0
Meath	195,044	220,296	25,252	12.9
Wicklow	142,425	155,485	13,060	9.2
Total	1,907,332	2,073,459	166,127	40.8

The Kildare County Development Plan 2017-2023 and Regional Spatial Economic Strategy (RSES) 2019-2031 (Eastern and Midland Regional Assembly (EMRA)) details Transitional Regional and County Population Projections to 2031 for the Mid-East counties which includes county Kildare. The population projection for county Kildare in 2026 is 249,000 at the lowest estimate and 245,000 on the highest estimate. The population projection for 2031 is 259,000 on the lowest estimate and 266,500 on the highest estimate.

Table 4-7: Population Projections for County Kildare (Source: RSES 2019-2031, EMRA)

Region and County	2016	2026 low – 2026 high	2031 low – 2031 high
Kildare	222,500	249,000-245,000	259,000-266,500

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4.3.2 Population and Age

As previously stated, at the time of writing this Chapter the 2022 census results do not contain specific information relating to age groups for towns therefore the 2016 results have been used in this assessment.

The CSO data for 2016 recorded 683 persons in living in Johnstown Bridge, the closest village to the Site of the Proposed Development. The nearest town to the Proposed Development for which detailed population data is available in Enfield, Co. Meath which is located approximately 4km from the Site. Although this town is in the neighbouring County Meath, Enfield is a more appropriate town for assessment when compared with the nearest town in Kildare, Edenderry, which is approximately 12km away from the Site.

The 2016 Census reported 3,239 persons living in Enfield, Co. Meath and 222,504 persons in living in Co. Kildare.

Table 4-8 shows the breakdown of the population of Enfield based on their age range group during the 2016 Census against the Kildare County and State averages. This table is further broken down into percentages of the population within these age ranges.

Table 4-8 Town, County and National Population Categorisation by Age

Age Group	Enfield		Kildare		Ireland	
	No. of People	% of People	No. of People	% of People	No. of People	% of People
Persons aged 0-4 years	404	12.5	17,314	7.8	331,515	7
Persons aged 5-24 years	965	29.8	64,203	28.9	1,251,489	26.3
Persons aged 25-34 years	486	15.0	29,276	13.2	659,410	13.8
Persons aged 35-44 years	739	22.8	38,115	17.1	746,881	15.7
Persons aged 45-54 years	340	10.5	30,151	13.6	626,045	13.1
Persons aged 55-64 years	174	5.4	21,431	9.6	508,958	10.7
Persons aged 65-74 years	91	2.8	14,202	6.4	373,508	7.8
Persons aged 75 years and over	40	1.2	7,812	3.5	264,059	5.5
Total	3,239		222,504		4,761,865	

As evident from Table 4-8, Enfield has a high young population. The largest portion of the population ranges between 5 to 24 years in the town of Enfield (29.8% in total), higher than the State average of 26.3%. In total, 4% of the population in Enfield are over 65 years. This is

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significantly lower than the percentage population of Kildare County (9.9%) and the State average (13.3%).

Children ranging from 0-4 years in the town of Enfield comprise 12.5%, significantly higher than the State average of 7%. People ranging from the ages 25 to 44 years comprise 37.8% of the population of Enfield, compared to 30.3% of the population of Kildare and 29.5% of the State. People ranging from the ages 55 to 64 years of age make up 5.4% of the population of Enfield, compared to 9.6% of the population of Kildare and 10.7% of the State.

This age profile statistics show that Enfield has a higher younger population than the State average and a lower aging population than the State average.

4.3.3 Household Statistics

An assessment of the type of accommodation in the county compared to the state was carried out. Most dwellings in Co. Kildare are either detached or semi-detached houses, with 57,528 of the 73,596 households in the county falling into these two categories, according to CSO data in 2016. The average number of persons per household in Co. Kildare is 3.0, slightly higher than the State average of 2.7.

Table 4-9 Private households by person by household in 2016 (Source: CSO)

Type of accommodation	Co. Kildare		State	
	Households	Persons	Households	Persons
Detached house	29,802	95,087	715,133	2,095,999
Semi-detached house	27,726	86,248	471,948	1,358,418
Terraced house	8,135	22,036	284,569	730,771
Flat or apartment in purpose-built block	6,232	13,526	172,096	364,243
Flat or apartment in a converted house or commercial building	742	1,388	28,783	50,769
Bed-sit	46	79	3,266	50,769
Caravan, mobile home or other temporary structure	248	569	4,624	10,272
Not stated	665	1,990	21,870	61,677
All households	73,596	220,923	1,702,289	4,722,829

4.3.4 Economic Activity & Employment

The labour force is defined by number of people above the legal working age that are available to work. The labour force participation rate is the number of people who are employed and unemployed but looking for a job, divided by the total working-age population.

In 2016, there were 2,304,037 persons in the labour force in Ireland. Table 4-3 shows the numbers of people and the percentage of the total population aged 15+ who were in the labour force during the 2016 Census. This figure is further broken down into the percentages that

were at work or unemployed. It also shows the percentage of the total population aged 15+ who were not in the labour force, i.e., those who were students, retired, unable to work or performing home duties.

*Table 4-10 Principal Economic Status by Town, County and State, Aged 15 Years and Over
(Source: CSO Census 2016)*

Status	Enfield		County		State	
Numbers and % of population aged 15+ who are in the labour force	No. of People	% of People	No. of People	% of People	No. of People	% of People
Employer or own account worker	156	7.3	13,364	7.9	313,404	8.3
Employee	1248	58.1	82,402	48.8	1,688,549	45.0
Unemployed looking for first regular job	18	0.8	1,395	0.8	31,434	0.8
Unemployed having lost or given up previous job	145	6.7	10,902	6.5	265,962	7.1
Assisting relative	4	0.2	181	0.1	4,688	0.1
Total number of people in the labour force	1,571	73.1	108,244	64.1	2,304,037	61.4
Numbers and % of the population aged 15+ who are not in the labour force	No. of People	% of People	No. of People	% of People	No. of People	% of People
Student or pupil	184	8.6	20,559	12.2	427,128	11.4
Looking after home/family	205	9.5	14,478	8.6	305,556	8.1
Retired	134	6.2	18,890	11.2	545,407	14.5
Unable to work due to permanent sickness or disability	52	2.4	6,255	3.7	158,348	4.2
Other economic status	3	0.1	518	0.3	14,837	0.4
Total number of people not in the workforce	578	26.9	60,700	35.9	1,451,276	38.6
All persons aged 15 years and over	2,149		168,944		3,755,313	

When assessing the percentage of people in the labour force, it is noted that 73.1% of the population in Enfield are in the labour force. This reflects the high number of people of a working profile living within the area. There is a significantly higher percentage of people than the overall state average of 61.4%.

Table 4-11 shows the broad range of industries that people in Enfield, County Kildare and the State are employed in according to the 2016 Census figures.

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Table 4-11 Population Aged 15+ in the Labour Force by Broad Industrial Group (Source CSO 2016)

Broad Industrial Group of Employment	Enfield	Kildare	State
Total in labour force	1,571	108,244	2,304,037
Wholesale and retail trade; repair of motor vehicles and motorcycles	213	15,037	266,673
Unemployed, having lost or given up previous job	145	10,902	265,962
Manufacturing	135	9,784	201,315
Accommodation and food service activities	135	9,586	116,918
Human health and social work activities	115	9,586	223,725
Education	114	8,822	176,855
Construction	108	5,838	101,849
Public administration and defence; compulsory social security	89	6,144	105,929
Financial and insurance activities	82	4,796	90,878
Professional, scientific and technical activities	73	5,230	113,522
Transportation and storage	72	4,159	81,124
Industry not stated	69	5,560	159,989
Information and communication	62	4,113	90,070
Administrative and support service activities	50	3,511	71,076
Other service activities	29	1,950	42,489
Arts, entertainment and recreation	23	1,627	34,165
Unemployed looking for first regular job	18	1,395	31,434
Agriculture, forestry and fishing	12	3,190	89,116
Electricity, gas, steam and air conditioning supply	11	593	12,919
Water supply; sewerage, waste management and remediation activities	6	578	10,259
Activities of households as employers producing activities of households for own use	4	158	2,803
Mining and quarrying	3	355	5,055
Real estate activities	3	461	9,044
Activities of extraterritorial organisations and bodies	0	19	868

Table 4-11 shows that 18 people based in Enfield Town and 1,395 people in County Kildare are looking for their first job. In addition to this Table 4-3 shows that 145 people based in Enfield and 10,902 people based in County Kildare are unemployed having lost or given up their previous job.

The closest social welfare office to the Proposed Development which has figures available for the number of people on the Live Register / unemployed is the Edenderry Intreo Centre. The Edenderry office covers the areas of Edenderry, Johnstownbridge, Kinnegad (part of), Clonard, Enfield, Carbury, Daingan, Rhode, Clonbullogue, Broadford, Clogherinkoe, Castlejordan, Mount Lucas, Cadamstown and Carrick. The monthly unemployment release contains a series of monthly unemployment rates and volumes. These are based primarily on the Labour Force Survey and are compiled in accordance with agreed international practice. These statistics are the definitive measure of monthly unemployment. The Live Register is used to provide a monthly series of the numbers of people (with some exceptions) registering for Jobseekers Benefit or Jobseekers Allowance or for various other statutory entitlements at local offices of the Department of Social Protection. Table 4-12 details the most recent information available from the CSO from March 2022 to September 2022 on the number of persons on the Live Register.

Table 4-12: Number of people on the live register

Month	March 2022	April 2022	May 2022	June 2022	July 2022	August 2022	September 2022
Number of Persons on Live Register, Bishop Square	838	873	819	837	899	897	765

The most recent publication of monthly unemployment statistics was issued by the CSO in October 2022 for reference month September 2022. The most recent information available records 897 people on the Live Register in the areas covered by the Edenderry Intreo Office.

4.3.5 Travel & Commuting

The times commuters in Enfield leave the house are detailed in Table 4-13. This table shows 25.9% of commuters leave the house between 08:31 and 09:00. 21.5% of people leave the house before 07:00 and 27.3% leave the house between 07:01 and 08:00.

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Table 4-13 Time Leaving the House, Enfield (Source CSO Census 2016)

	All persons	Percentage	Children at school aged between 5 and 12 years	Students at school or college aged between 13 and 18 years	Students at school or college aged 19 years and over	Population aged 15 years and over at work
Before 06:30	243	10.7	0	0	1	242
06:30 - 07:00	245	10.8	1	6	6	232
07:01 - 07:30	278	12.3	12	43	15	208
07:31 - 08:00	340	15.0	18	116	12	194
08:01 - 08:30	261	11.5	55	44	8	154
08:31 - 09:00	588	25.9	458	20	11	99
09:01 - 09:30	70	3.1	14	1	4	51
After 09:30	179	7.9	3	1	4	171
Not stated	63	2.8	21	2	2	38
Excludes those who work mainly at or from home						

Table 4-14 shows that the majority of people (29.9%) have a commute of less than quarter of an hour. 20.3% of people travel between 15 minutes and 30 minutes. 16.2% of people travel between 30 minutes and 45 minutes with 28.7% of people travelling for longer than 45 minutes.

Table 4-14 Duration of Commute (Source: CSO Census, 2016)

Duration of Commuting Time	Total Number of People	Percentage of People	No. of Children aged between 5 and 12 years	No. of Students aged between 13 and 18 years	No. of Students aged 19 years and over	No. of People aged 15 years and over at work
< ¼ hour	678	29.9%	462	36	4	176
¼ hour - < ½ hour	460	20.3%	75	127	13	245
½ hour - < ¾ hour	368	16.2%	16	47	8	297
¾ hour - < 1 hour	297	13.1%	1	8	9	279
1 hour - < 1½ hours	272	12.0%	1	4	13	254
1½ hours and over	82	3.6%	0	3	12	67
Not stated	110	4.9%	27	4	4	71

As detailed in Table 4-10, the motor car is the most popular means of transport in Enfield with 42.2% travelling by car as a driver and 10.7% travelling by car as a passenger. A total of 18.7% of people travel by foot and 14.9% of people travel by bus.

Table 4-15 Means of Commute (Source, Census 2016)

	Total Number of People	% of People	No. of Children aged between 5 and 12 years	No. of Students aged between 13 and 18 years	No. of Students aged 19 years and over	No. of People aged 15 years and over at work
On foot	431	18.7	354	6	4	67
Bicycle	33	1.4	22	0	0	11
Bus, minibus or coach	343	14.9	42	148	26	127
Train, DART or LUAS	63	2.7	1	18	11	33
Motorcycle or scooter	5	0.2	0	0	0	5
Motor car: Driver	972	42.2	0	2	15	955
Motor car: Passenger	247	10.7	146	57	5	39
Van	116	5.0	0	0	1	115
Other, incl. lorry	5	0.2	0	0	0	5
Work mainly at or from home	35	1.5	0	0	0	35
Not stated	52	2.3	17	2	1	32
Total	2302	100	582	233	63	1424

4.3.6 Tourism and Amenities

Tourism is a hugely important sector of the Irish economy and it provides a significant number of full-time and seasonal employment. Kildare received 211,000 overseas visitors in 2016, creating a revenue of €115 million. The total number of overseas visitors to Co. Kildare has been steadily increasing over the last number of years with a slight dip in numbers in 2016. Kildare is a key location in Fáilte Ireland's new Ancient East branding umbrella and has the necessary concentration of accommodation and attractions to become a significant tourism destination. The proximity of Kildare to the Dublin area provides further tourism potential for the area.



Table 4-16 Number of overseas visitors from 2012-2016 (Source: Fáilte Ireland)

Area	No. of overseas visitors				
	2012	2013	2014	2015	2016
State	6,286,000	6,686,000	7,105,000	8,036,000	13,982,000
Co. Kildare	139,000	166,000	183,000	214,000	211,000

4.3.7 Landscape and Visual

The Proposed Development is situated in the townland of Thomastown, Co. Kildare. Kildare is situated in the Irish midlands located in the province of Leinster. The Proposed Development has a total area of 7.243 ha (17.898 acres) and lies at or slightly below the level of the public road. Johnstown Bridge village is located approximately 1.5km east of the site and the village of Kilshanroe is 1.80 km to the south-west. The setting is predominantly rural with surrounding land uses of agriculture, forestry and a number of one-off residential dwellings and one-off commercial type facilities.

The entrance to the Proposed Development is located along an un-named local road just off the R402. The site is located approximately 2.5km from junction 9 on the M4 motorway.

There are no designated scenic routes or protected views located within the vicinity of the site or within the wider vicinity of Thomastown.

The Proposed Development is located in a rural setting and is surrounded by hedgerows in almost all of its periphery bar one section of the hedgerow in the south-eastern corner.

4.3.8 Human Health

Health is an essential resource for everyday life, a public good, and an asset for health and human development. A healthy population is a major asset for society and improving the health and wellbeing of the nation is a priority for Government. Healthy Ireland Framework 2013-2025 is a collective response to the risks that threaten Ireland's future health and wellbeing.

Tables 4-17 shows that 89.5% of people of all ages in County Kildare, and 92.4% of people of all ages in Enfield, have self-identified themselves in the 2016 Census as having a health status of 'very good' or 'good'. A total of 1.3% of people of all ages in County Kildare and 0.9% of people of all ages in Enfield have a health status of 'bad' or 'very bad'.



Table 4-17 All Persons (all ages) in Enfield and County Kildare General Health Status and Census Year 2016

General Health Status	No. of People (Enfield)	% of People	No. of People (Kildare)	% of People
General health - Very good	2,188	67.6	140,402	63.1
General health - Good	804	24.8	58,752	26.4
General health - Fair	160	4.9	15,064	6.8
General health - Bad	22	0.7	2,527	1.1
General health - Very Bad	7	0.2	549	0.2
Not stated	58	1.8	5,210	2.3

4.3.9 Social Health

According to the World Health Organisation, poor social and economic circumstances affect health throughout life. *'Good health involves reducing levels of educational failure, reducing insecurity and unemployment, and improving housing standards'.*

Health is influenced, either positively or negatively, by a variety of factors. Some of these factors are genetic or biological and are relatively fixed. *'Social determinants of health'* arise from the social and economic conditions in which people live. They are not so fixed such as type of housing and environments, access to health or education services, incomes generated and the type of work people do, can all influence a person's health, and the lifestyle decisions people make.

A range of factors have been identified as social determinants of health, these generally include the wider socio-economic context, inequality; poverty, social exclusion, socio-economic position, income, public policies, health services, employment, education, housing, transport, the built environment, health behaviours or lifestyles, social and community support networks and stress.

People who are less well off or who belong to socially excluded groups tend to fare badly in relation to these social determinants. Being at work on the other hand provides not only an income, but also access to social networks, a sense of identity and opportunities for development or progression.

Figure 4-3 presents the social determinants of health adapted from Dalghren and Whitehead (1991) and Grant and Barton (2006) as presented in Healthy Ireland, A Framework for Improved Health And Wellbeing 2013 – 2025 (Department of Health. 2013).

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Determinants of Health

(Adapted from Dalghren and Whitehead, 1991 and Grant and Barton, 2006)

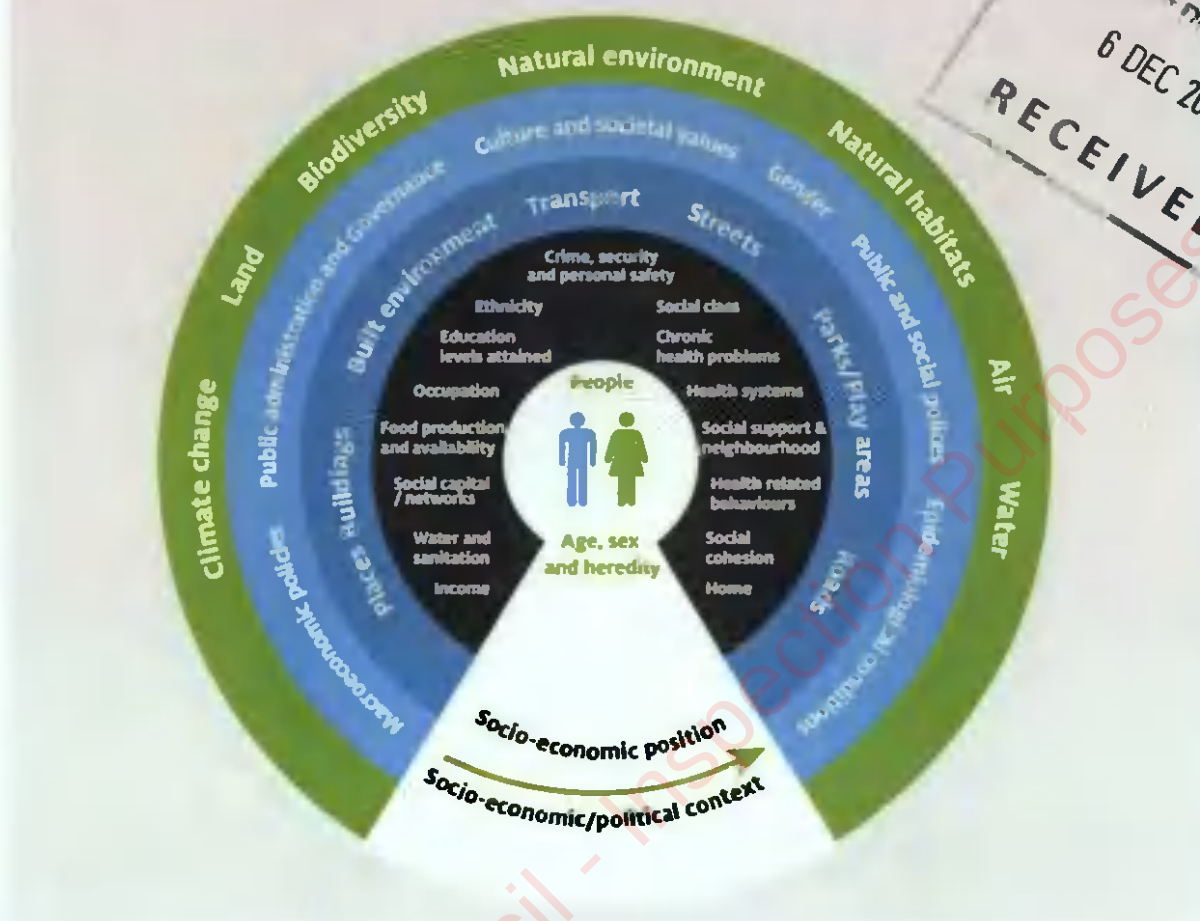


Figure 4-3 Social Determinants of Health (Healthy Ireland, Department of Health 2013
(Adapted from Dalghren and Whitehead, 1991 and Grant and Barton, 2006))

Section 4.3.4 of this Chapter states 73.1% of the population in the Enfield are in the labour force. This reflects the high number of people of a working profile living within the area. The percentage of people at work (Employer or own account worker and Employee) is 65.4% for the Enfield, which is slightly lower than the percentage for the State of 69.7%.

As detailed in Table 4-17, 92.4% of people in Enfield and 89.5% of people in County Kildare have self-identified themselves in the 2016 Census as having a health status of 'very good' or 'good'. The high employment levels, coupled with the self-identification of health status in both Enfield and Kildare, indicating that positive social health conditions exist.

4.4 Characteristics of the Proposed Development

The Proposed Development comprises the importation of material to in-fill and re-contour a site which was previously quarried. The Applicant proposes, subject to the grant of permission, to import clean greenfield soil, subsoil and stone to remediate approximately 3.689ha of the total site. The 3.689ha is divided into two distinct areas – Area 1 is 2.718ha and Area 2 is 0.971ha. A fill plan has been drawn up for the importation of 68,970m³ of soil to fill Area 1, and

16,670m³ to fill Area 2, equating to a total of 85,640m³ (ca. 128,460 tonnes) of soil and subsoil. A volume to weight conversion factor of 1.50 is taken from the Waste Management (Landfill Levy) Regulations, 2008, SI 199 of 2008. The surface layer will comprise of 300mm of topsoil which will be graded to an even surface finish. It is proposed even out the levels of the site in order to allow for the safety of grazing animals. Once the importation is complete the Applicant will seed the land in line with Teagasc guidelines and return it to agricultural use. The proposed new levels and fill plan are detailed in Drawings P-01 to P-07 prepared by Enviroguide Consulting, 2022 (refer to Appendix A).

Once planning permission is obtained, it is intended to apply to Kildare County Council for a Waste Facility Permit. Material will be accepted in accordance with the conditions of the permit. As part of the Environmental Management Plan a register of incoming materials for the site will be maintained at all times. The only List of Waste (LoW) code accepted on site will be 17 05 04 - Soil and Stones other than those mentioned in 17 05 03.

It is proposed to accept material onto the site from 08.00 until 18.00 Monday to Friday and 08.00 to 14.00 on Saturday. It is not proposed to operate on Sundays or Bank Holidays.

Temporary welfare facilities will be located in the northeast of the site as per Figure 2-2, Site Layout Plan and harvested rainwater will be used in the wheel wash or for dust suppression.

Soil will be imported using Heavy Goods Vehicles from contractors authorised to transport waste, coming from a known source which has previously been inspected. In the interest of maintaining quality of incoming material the number of contractors delivering material to the site will be limited to a single contractor. Prior to deposition the consignment note for each load will be inspected by the site supervisor to ensure that the material is acceptable, and each load will be evaluated in accordance with the site's waste acceptance procedure.

The site has the potential to import inert soil and stones for land improvement for agriculture uses and will also improve drainage. As the site elevations decrease from across the site, with the most acute declines located to the north, it is proposed to raise the northern, central and southern sections of the site to come in line with the boundary elevations, refer to Drawings P-04 and P-05 for elevations. The proposed plant will consist of a tracked bulldozer for placing the soil and compressing it to a level that will permit good drainage. An excavator may be brought on to site from time to time to construct internal haul roads.

Thus, the focus of the proposed filling is concentrated in the central and eastern areas of the site. Cut and fill cross sections for the Proposed Development are attached as part of this planning application (refer to drawings included as Appendix A). Details of existing ground level, proposed change in elevation and final fill level are detailed in Drawings P-01 to P-07. It is proposed to carry this work out over a 5-year period, subject to the availability of appropriate soil, to allow the soil to settle naturally with minimal compaction. The soil and subsoils will be mixed, to minimise compaction and improve drainage.

Filling operations will be confined to a selected area of the site at any one time with each area being restored in a timely manner from commencement of the next phase.



A 10-meter buffer and silt fence will be maintained along the eastern boundaries of the site where no soil importation will take place to protect surface waters and to ensure that there are no offsite nuisances created by the site.

The re-profiling of the surface will be carried out to allow for the planting of native grassland as recommended by Teagasc. The re-profiling works will be supervised by a qualified landscape architect to ensure that the filling is carried out in a manner that will derive maximum benefit from this.

4.5 Potential Impact of the Proposed Development

The Proposed Development will be for the importation of material to in-fill and re-contour the site in an environmentally sound manner, in order that the site can be rendered suitable for agriculture, thus resulting in a positive effect on the health of the community.

The Proposed Development has the potential to provide employment opportunities and health improvements. Employment and income are among the most significant determinants of long-term health, influencing a range of factors including the quality of housing, education, diet, lifestyle, coping skills, access to services and social networks.

4.5.1 Construction Phase

This section assesses the impact of the Proposed Development on the human environment during the construction phase. The Construction Phase will consist of limited excavation and regrading of soil for the construction of the impermeable inspection and quarantine area, installation of the Site office and welfare facilities (portacabins), the weighbridge, and the wheel wash.

4.5.1.1 Human Health

The Proposed Development has the potential to provide health improvements due to the creation of additional employment. Employment and income are among the most significant determinants of long-term social health. This will be a positive impact due to the creation of direct and indirect employment during the construction phase. It is anticipated that a total of 2 personnel will be employed directly during the Proposed Development which will have a slight, positive, short-term impact on population and human health.

It is expected that all workers employed as part of the Proposed Development will comply with the relevant HSE guidelines and any Government protocols that will be in place at that point in time in relation to Covid-19. If all Covid-19 safety protocols and hygiene measures are adhered to it is considered that the Proposed Development poses no additional Covid-19 risk.

An extensive Japanese Knotweed (JK) stand was recorded within the southern area of the Site, with an additional small stand just south of the access road inside the main Site area, and another outside of the Site boundary at the access gate from the main road. The JK found within the Site boundaries will be removed by a specialist JK consultant prior to commencing any infilling activities at the Site. Additionally, a JK Management Plan will be submitted to KCC for approval prior to the removal. As such there will be no significant impact on human health a result of invasive species.

4.5.2 Operational Phase

4.5.2.1 Human Health

All workers employed during the operational phase of the Proposed Development will comply with the relevant HSE guidelines and any Government protocols that will be in place at that point in time in relation to Covid-19. If all Covid-19 safety protocols and hygiene measures are adhered to it is considered that the Proposed Development poses no additional Covid-19 risk.

The Proposed Development has the potential to provide health improvements due to the creation of additional employment. Employment and income are among the most significant determinants of long-term health. It is anticipated that a total of 2 personnel will be employed directly during the Proposed Development which will have an imperceptible, positive, short-term impact on population and human health.

Radon is a radioactive gas that causes lung cancer. It is formed in the ground by the radioactive decay of uranium which is present in all rocks and soils. Chapter 6 Land and Soil of this EIAR has identified the Site as being located within a High Radon Area. When outdoors, radon becomes quickly diluted to harmless levels however if radon enters an enclosed, indoor space the levels can quickly accumulate to harmful levels. A site office and welfare facilities are proposed in the northwest portion of the site. As employees will spend the majority of the day working in mobile plant on the site where infill activities will be carried out, radon gas will have an imperceptible, neutral short-term effect for the duration of the Operational Phase. It is recommended that radon testing be carried out in the indoor welfare facilities. A radon detector should be installed for a period of 3 months after which time the detector should be sent to one of the testing services recommended by the EPA. The acceptable level, or Reference Level, for workplaces in Ireland is 300 becquerels per cubic metre (Bq/m³). If radon results are below 300 Bq/m³ no further action is required unless major refurbishment work is carried out.

4.5.2.2 Socio Economic

The Proposed Development will require transport of soil and subsoil from greenfield development sites to the facility. The Proposed Development will create 2 no. jobs in the area and will also create additional indirect employment for example drivers delivering soil to the Site. The Proposed Development will have an imperceptible, short-term, positive effect in terms of additional direct and indirect employment and on the local socio-economic environment.

4.5.2.3 Air Quality

The greatest potential effect on air quality, and subsequent effect on human health, during the Operational Phase of the Proposed Development is from dust generation associated with the infill of the site. Movement of vehicles to and from the site will potentially generate exhaust fumes and consequently potential emissions of volatile organic compounds, nitrogen oxides, sulphur oxides, and PM10 (dust). Fine particles associated with these sources are recognised as a potential significant cause of pollution and can be damaging to the health of the surrounding population.

According to the Health Service Executive (HSE), the health effects associated with the main pollutants of concern are:

- Nitrogen Dioxide, Sulphur Dioxide, Ozone - Irritate the airways of the lungs, increasing the symptoms of those suffering from lung diseases.
- Particles (PM10, PM2.5) - Can be carried deep into the lungs where they can cause inflammation and a worsening of heart and lung diseases.
- Carbon Monoxide - Prevents the uptake of oxygen by the blood and poses a greater risk to those suffering from heart disease.

Sensitive receptors (SRs) in the vicinity of the Proposed Development have been identified as one-off rural housing and farm buildings of low density. Chapter 8 of this EIAR has assessed 9 no. sensitive receptors for potential dust impacts and concluded that based on the prevailing wind conditions and the natural buffers that exist between the site the dust emissions associated with the Proposed Development will not have a significant impact on the local sensitive receptors. Therefore, there will be no significant impact on the human health of the surrounding population.

The Proposed Development has the potential to impact air quality in the form of traffic related emissions. IAQM guidance sets out criteria, detailed in Section 8.5.1.2 of this EIAR, which determines whether a project is required to carry out an air quality assessment. As per Chapter 8 and 12.1 of this EIAR, the Proposed Development does not exceed these criteria. It is therefore considered unlikely for significant air quality impacts to occur as a result of increased traffic flow and as such there will be no significant impact on human health. Air quality is likely to have an imperceptible, short term negative impact on human health.

4.5.2.4 Noise and Vibration

Noise exposure can cause a variety of human health effects including annoyance, sleep disturbance, raised stress levels, work impacts for commercial receptors or individuals who work from home.

Potential effects associated with Operational Phase noise will be operational traffic and mobile on-site plant. A total of 9 no. Noise Sensitive Locations (NSLs) have been identified within a 250m buffer of the Proposed Developments. Chapter 9 has concluded that *"No traffic routes are predicted to experience increases of more than 25% in total traffic flows during the Operational Phase and therefore no detailed assessment is required as per the DMRB Guidelines. Refer to Chapter 12.1 of the EIAR for a detailed traffic assessment report. The impact of noise from operational traffic will be unnoticeable and will not have a negative impact."* In relation to noise emissions associated with on-site plant, *"daytime noise limits for a non-quiet area will not be exceeded at this location as a result of plant machinery"*.

Based on the above conclusions, noise as result of the Proposed Development is likely to cause a slight, short-term negative impact on human health.

4.5.2.5 Landscape and Visual

The Proposed Development will alter the visual appearance of the landscape and visual amenity of the surrounding area which may impact the residential amenity of surrounding properties.

The Proposed Development will have a significant and negative landscape impact in the short to medium term, but that will develop to a neutral impact in the long term, after the on-site fill and re-contour is completed. In terms of visual impact, 8 no. viewpoints were selected and assessed.

assessed in Chapter 10. Due to the agricultural nature of the site of the Proposed Development, the lack of nearby sensitive receptors in the context of landscape and visual, and the proposed design it is considered that the Proposed Development will have a 'neutral' 'long-term' visual impact.

4.5.2.6 Traffic and Transport

A full assessment of traffic and transport effects are presented in Chapter 12.1 of this EIAR carried out by Transport Insights. As detailed in Chapter 12.1 the overall impact of the development in transportation terms will be a small increase in local lorry traffic. However, the existing road links and junctions have adequate capacity to cater for post development traffic flows. The Proposed Development will have no measurable impact on surrounding road network or the operation of the existing access points. As such there will be no significant impact on human health as result of traffic.

4.5.2.7 Tourism and Community Amenities

It is considered that the Proposed Development, due to its scale and nature, does not have the capacity to cause any impact on tourism, either locally or in the wider area.

Therefore, the effects on community and amenities is deemed to be imperceptible, neutral and long-term.

4.5.3 Potential Cumulative Impacts

Cumulative Impacts can be defined as "impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project". Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the accumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

A review of other off-site developments and permitted developments was completed as part of this assessment. The following projects and plans were reviewed and considered for possible cumulative effects with the Proposed Development.

In the context of population and human health and given the Proposed Development and its surrounding environment, no cumulative effects are anticipated from the introduction of the Proposed Development.

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Table 4-18: Cumulative Impacts Table

Planning Ref No.	Applicant Name	Summary of Development
191018	Niall Flanagan	Importation of clean topsoil and subsoil into the subject site of 4.29 hectares at Thomastown, Johnstown Bridge, Co. Kildare, in order that the site can be rendered suitable for agriculture. It is proposed to improve approximately 3.79 ha of the site and it is estimated that this will require approximately 62,457 cubic metres of greenfield, inert soil and stone. The applicant also proposes to install a temporary site office and canteen, wheelwash, portaloo and carry out all ancillary site works. The application relates to an activity requiring a Waste Facility Permit from Kildare County Council. Revised by significant further information consisting of; an Environmental Impact Assessment Report (EIAR) has been submitted. Granted Permission: 02/07/2020
16660 (171192)	Patrick O'Connor	A storey and a half dormer type dwelling, detached domestic garage, "Aquamax" wastewater treatment system and sand polishing filter together with all associated site works Granted Permission: 01/11/2016

4.5.4 "Do Nothing" Impact

A do-nothing scenario would result in the site remaining undeveloped. If the Proposed Development were not to proceed there would be no immediate impact on the existing population, or economic activity for residents living in the area.

If the lands were to remain undeveloped, this would be an under-utilisation of serviceable lands from a sustainable planning and development perspective, particularly considering the location of the lands and the need for facilities for the acceptance of soil and stones.

4.6 Avoidance, Remedial & Mitigation Measures

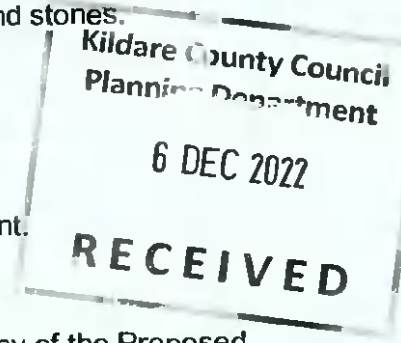
4.6.1 Construction Phase

There is no Construction Phase associated with the Proposed Development.

4.6.2 Operational Phase

It is not considered that mitigation measures are required with regard to any of the Proposed Development's impacts on local population or on the local economy. There is no mitigation recommended in relation to land use or tourism as there will not be a significant adverse impact. The Site of the Proposed Development is located on an existing greenfield site and will be solely used for the acceptance of greenfield soil and stone for remediation of the Site itself.

The area surrounding the site is mainly farmland with sparse one-off housing and one-off commercial type facilities. The operation of the Site is small in nature and does not have the capacity to impact on the wider area. Any impacts on human beings as result of environmental



issues such as dust, noise, traffic and visual impacts are addressed in the following sections of the EIAR and include proposals for mitigation where necessary to ensure that such impacts are eliminated or reduced to acceptable levels.

- Chapter 8 – Air Quality
- Chapter 9 – Noise and Vibration
- Chapter 10 – Landscape
- Chapter 12 – Material Assets & Traffic

Compliance monitoring will be undertaken, as per regulatory conditions and annual environmental reports will be compiled to detail the performance of the site once operational. If the site is granted permission these control measures will be maintained to monitor and reduce any impacts in compliance with the Waste Facility Permit for the facility.

4.6.3 “Worst Case” Scenario

In the worst-case scenario where mitigation measures fail for the Proposed Development, it is considered that localised nuisances such as noise or dust may arise. This is considered highly unlikely and indeterminable.

4.7 Residual Impacts

It is considered that the Proposed Development will have a positive residual effect on population and socioeconomic aspects securing existing and future employment.

4.8 Monitoring

4.8.1 Construction Phase

No Construction works are proposed at the site of the Proposed Development, therefore monitoring measures are not proposed.

4.8.2 Operational Phase

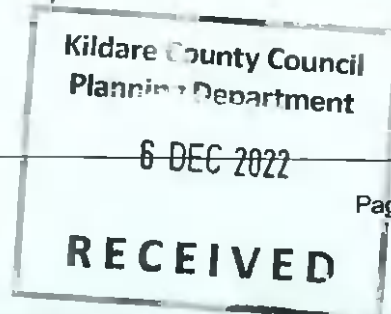
It is recommended that radon testing be carried out in indoor welfare facilities. As per the EPA recommendations;

“If radon levels are above the national workplace Reference Level (300Bq/m³):

- you will need to carry out remediation work to reduce your levels.*
- you will then need to re-test the rooms that were above 300 Bq/m³ to confirm that the radon levels have been reduced to below this level.*
- remediation work and a retest should be carried within 12 months of the original test.*
- rooms that originally tested above 300 Bq/m³ should be retested every 5 years.*

If your radon results are below 300 Bq/m³ no further action is required unless major refurbishment work is carried out to the building. For example:

- fitting new windows*
- building an extension*



- *insulation or any other work that could possibly open up new entry routes for radon or prevent radon escaping from the building"*

No other specific monitoring measures are required in relation to population and settlements, given the lack of direct effects resulting from the Proposed Development. However, where required, monitoring in relation to air emissions, noise and traffic are identified in their respective Chapters in this EIA Report.

The Proposed Development will be subject to a Waste Facility Permit (WFP) from Kildare County Council. The operator will comply with monitoring requirements as per the conditions of the WFP.

4.9 Interactions

As noted above, there are numerous inter-related environmental topics described in detail throughout this EIAR document which are of relevance to human health. No construction phase is proposed for this development. During the operational phase noise, air, traffic and landscape and visual will be the key environmental factors that will have an impact on population and human health.

4.9.1 Noise and Vibrations

During the operational phase, the outward noise impact to the surrounding environment will be limited to any additional traffic on surrounding roads and the operation of on-site machinery. The impact assessment has concluded that additional noise related traffic from the Proposed Development during the operational phase will be unnoticeable and not have a negative impact. Noise monitoring will be carried out to ensure that the facility is operated in accordance with the Waste Facility Permit that will be applied for, for the importation of soils and subsoils and to ensure that offsite noise does not give rise to nuisance to any residents.

4.9.2 Air Quality and Climate

The interaction with air quality during the operational phase has the potential to cause health and dust nuisance issues. The Proposed Development may cause additional dust from operational traffic and infill activities. No significant impacts associated with air quality have been identified. However, mitigation measures will be put in place at the Proposed Development to ensure that the impacts and their effects comply with all ambient air quality legislative limits and therefore the predicted impact is not significant with a neutral effect on human health.

4.9.3 Material Assets: Traffic

There is potential for interaction with Traffic during the operational phase. However, the traffic assessment carried (as detailed in Chapter 12 of this EIAR), concludes that the increase in traffic as a result of the Proposed Development will be insignificant and will not cause any negative impact. There will be no predicted impact on human health.

4.9.4 Landscape and Visual

It is not considered that the Proposed Development by virtue of its visual appearance, will have likely negative effects on the human health of the local population.

4.10 Difficulties Encountered When Compiling

No difficulties were encountered.

4.11 References

Central Statistics Office (CSO)

Environmental Protection Agency (2022) Radon testing, Available at:
<https://www.epa.ie/environment-and-you/radon/radon-testing/>

Fáilte Ireland (2017) Regional Tourism Performance in 2016. Research and Evaluation, Fáilte Ireland.

Fáilte Ireland (2017) Tourism Facts 2016. Research and Evaluation, Fáilte Ireland.

Healthy Ireland Framework 2013-2025

Kildare County Council (2018) Kildare County Development Plan 2017-2023

Kildare County Council (2023) Draft Kildare County Development Plan 2023-2029

National and Regional Employment in the Drinks and Hospitality Sector, Drinks Industry Group of Ireland, August 2017

Ordinance Survey Ireland (OSI)

People, Place and Policy: Growing Tourism to 2025, Department of Transport, Tourism and Sport, March 2015

Regional Planning Guidelines of the Greater Dublin Area 2010-2022

WHO. Ottawa Charter for Health Promotion First International Conference on Health Promotion Ottawa, 21 November 1986 - WHO/HPR/HEP/95.1. 1986.

WHO. Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948. 1946.



5 BIODIVERSITY

5.1 Introduction

This Chapter describes the Biodiversity of the Site of the Proposed Development and surrounding environs, with emphasis on habitats, flora, and fauna, and details the methodology of assessment used in each case. It provides an assessment of the impacts of the Proposed Development on habitats and species, particularly those protected by National and International legislation, or considered to be of Conservation Importance; and proposes measures for the mitigation of these impacts, where appropriate.

The Chapter has been completed having regard to the *Guidelines for Ecological Impact Assessment in the UK and Ireland*, by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018), together with the guidance outlined in the Environmental Protection Agency documents *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (May 2022) and *Advice Notes for Preparing Environmental Impact Statements* (Draft, September 2015). The value of the ecological resources, the habitats, and species present or potentially present, was determined using the ecological evaluation guidance given in the National Roads Authority's (NRA) *Ecological Assessment Guidelines* (NRA, 2009).

5.1.1 Quality Assurance and Competence

All surveying and reporting have been carried out by qualified and experienced ecologists and environmental consultants. Dr Sanni Hintikka, Ecologist with Enviroguide Consulting wrote this Chapter and undertook the desktop research and habitat surveys. Brian McCloskey, Ecologist and Ornithologist with Enviroguide Consulting, undertook the breeding bird surveys.

Dr Sanni Hintikka has a B.Sc. (Hons) in Zoology and a Ph.D. in Marine Ecology from University College Dublin, and a wealth of experience in desktop research, bioinformatics analyses, literature review and reporting, as well as practical field and laboratory experience including freshwater and marine fish surveys and environmental DNA analysis. Sanni has prepared several Stage I and Stage II Appropriate Assessment Reports and authored a number of Ecological Impact Assessments.

Brian McCloskey is a graduate Ecologist and experienced Ornithologist with 11 years of birding experience. Brian holds a degree in Planning and Environmental management from Technological University Dublin. Brian is a longstanding and active member of Bird Watch Ireland and has provided Ornithology survey work for ecological consultancies. e.g., Vantage points surveys of Gulls, Terns, Raptors, Waders and Wildfowl; hinterland surveys of the above as well as riverine species; and breeding waders and country birds. Brian is highly experienced with all survey methodologies and with surveying all species groups of Irish birds and migrants.

5.1.2 Relevant Legislation and Policy

5.1.2.1 National Legislation

Wildlife Act 1976 and amendments

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The Wildlife Act 1976 was enacted to provide protection to birds, animals, and plants in Ireland and to control activities which may have an adverse impact on the conservation of wildlife. With regard to the listed species, it is an offence to disturb, injure or damage their breeding or resting place wherever these occur without an appropriate licence from the National Parks and Wildlife Service (NPWS). This list includes all birds along with their nests and eggs. Intentional destruction of an active nest from the building stage up until the chicks have fledged is an offence. This includes the cutting of hedgerows from the 1st of March to the 31st of August. The act also provides a mechanism to give statutory protection to Natural Heritage Areas (NHAs). The Wildlife Amendment Act 2000 widened the scope of the Act to include most species, including the majority of fish and aquatic invertebrate species which were excluded from the 1976 Act.

The current list of plant species protected by Section 21 of the Wildlife Act, 1976 (and amendments) is set out in the Flora (Protection) Order, 2022 (S.I. No. 235 of 2022). The Flora (Protection) Order affords protection to several species of plant in Ireland, including 89 vascular plants, 40 mosses, 24 liverworts, 2 stoneworts and 1 lichen. This Act makes it illegal for anyone to uproot, cut or damage any of the listed plant species and it also forbids anyone from altering, interfering, or damaging their habitats. This protection is not confined to within designated conservation sites and applies wherever the plants are found.

EC (Birds and Natural Habitats) Regulations 2011

The EU Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive 1992) provides protection to particular species and habitats throughout Europe. The Habitats Directive has been transposed into Irish law through the EC (Birds and Natural Habitats) Regulations 2011.

Annex IV of the EU Habitats Directive provides protection to a number of listed species, wherever they occur. Under Regulation 23 of the Habitats Directive, any person who, in regards to the listed species, "Deliberately captures or kills any specimen of these species in the wild, deliberately disturbs these species particularly during the period of breeding, rearing, hibernation and migration, deliberately takes or destroys eggs from the wild or damages or destroys a breeding site or resting place of such an animal shall be guilty of an offence."

Invasive Species Legislation

Certain plant species and their hybrids are listed as Invasive Alien Plant Species in Part 1 of the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulations 2011* (SI 477 of 2011, as amended). In addition, soils and other material containing such invasive plant material, are classified in Part 3 of the Third Schedule as vector materials and are subject to the same strict legal controls.

Failure to comply with the legal requirements set down in this legislation can result in either civil or criminal prosecution, or both, with very severe penalties accruing. Convicted parties under the Act can be fined up to €500,000.00, jailed for up to 3 years, or both.

Extracts from the relevant sections of the regulations are reproduced below.

"49(2) Save in accordance with a licence granted [by the Department of Arts, Heritage and the Gaeltacht], any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in anyplace [a restricted non-native plant], shall be guilty of an offence.

49(3) ... it shall be a defence to a charge of committing an offence under paragraph (1) or (2) to prove that the accused took all reasonable steps and exercised all due diligence to avoid committing the offence.

50(1) Save in accordance with a licence, a person shall be guilty of an offence if he or she [...] offers or exposes for sale, transportation, distribution, introduction, or release—

(a) an animal or plant listed in Part 1 or Part 2 of the Third Schedule,

(b) anything from which an animal or plant referred to in subparagraph (a) can be reproduced or propagated, or

(c) a vector material listed in the Third Schedule, in any place in the State specified in the third column of the Third Schedule in relation to such an animal, plant or vector material."

5.1.2.2 International Legislation

EU Birds Directive

The Birds Directive constitutes a level of general protection for all wild birds throughout the European Union. Annex I of the Birds Directive includes a total of 194 bird species that are considered rare, vulnerable to habitat changes or in danger of extinction within the European Union. Article 4 establishes that there should be a sustainable management of hunting of listed species, and that any large scale non-selective killing of birds must be outlawed. The Directive requires the designation of Special Protection Areas (SPAs) for: listed and rare species, regularly occurring migratory species and for wetlands which attract large numbers of birds. There are 25 Annex I species that regularly occur in Ireland and a total of 153 Special Protection Areas have been designated.

EU Habitats Directive

The Habitats Directive aims to protect some 220 habitats and approximately 1000 species throughout Europe. The habitats and species are listed in the Directives annexes, where Annex I covers habitats and Annex II, IV and V cover species. There are 59 Annex I habitats in Ireland and 33 Annex IV species which require strict protection wherever they occur. The Directive requires the designation of Special Areas of Conservation for areas of habitat deemed to be of European interest. The SACs together with the SPAs from the Birds Directive form a network of protected sites called Natura 2000. An Appropriate Assessment is required under Article 6 of the Habitats Directive where a project or plan may give rise to significant effects upon a European site. This is addressed further in the AA Screening Report and accompanying this application.

Water Framework Directive



The EU Water Framework Directive (WFD) 2000/60/EC is environmental legislation which aims to protect and improve water quality. It applies to rivers, lakes, groundwater, estuaries, and coastal waters. The Water Framework Directive was agreed by all individual EU member states in 2000, and its first cycle ran from 2009 – 2015. The Directive runs in 6-year cycles, so the second (current) cycle runs from 2016 – 2021. The aim of the WFD is to prevent any deterioration in the existing status of water quality, including the protection of good and high water quality status where it exists. The WFD requires member states to manage their water resources on an integrated basis to achieve at least 'good' ecological status, through River Basin Management Plans (RBMP), by 2027.

Bern and Bonn Convention

The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982) was enacted to conserve all species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) was introduced to give protection to migratory species across borders in Europe.

Ramsar Convention

The Ramsar Convention on Wetlands is an intergovernmental treaty signed in Ramsar, Iran, in 1971. The treaty is a commitment for national action and international cooperation for the conservation of wetlands and their resources. In Ireland there are currently 45 Ramsar sites which cover a total area of 66,994 Ha.

5.1.2.3 Kildare County Council Development Plan

Policies of the Kildare County Council Development Plan 2017-2023 that are of relevance to this Biodiversity Chapter are outlined below:

Policy AG1: Support agricultural development and encourage the continuation of agriculture as a contributory means of maintaining population in the rural area.

Policy AG2: Encourage the development of environmentally sustainable agricultural practices, to ensure that development does not impinge on the visual amenity of the countryside and that watercourses, wildlife habitats and areas of ecological importance are protected from the threat of pollution.

Objective NHO1: Identify and protect, in co-operation with the relevant statutory agencies and other relevant groups, sites of local biodiversity importance (Local Biodiversity Areas), not otherwise protected by legislation.

Objective NHO4: Identify, conserve and provide guidance on development in important local biodiversity sites.

Policy NH5: Prevent development that would adversely affect the integrity of any Natura 2000 site located within and immediately adjacent to the county and promote favourable conservation status of habitats and protected species including those listed under the Birds Directive, the Wildlife Acts and the Habitats Directive.

Policy NH6: Ensure an Appropriate Assessment, in accordance with Article 6(3) and Article 6(4) of the Habitats Directive and with DEHLG guidance (2009), is carried out in respect of any plan or project not directly connected with or necessary to the management of a Natura 2000 site to determine the likelihood of the plan or project having a significant effect on a Natura 2000 site, either individually or in combination with other plans or projects and to ensure that projects which may give rise to significant cumulative, direct, indirect or secondary impacts on Natura 2000 sites will not be permitted (either individually or in combination with other plans or projects) unless for reasons of overriding public interest.

Policy NH11: Ensure that development does not have a significant adverse impact on rare and threatened species, including those protected under the Wildlife Acts 1976 and 2012, the Birds Directive 1979 the Habitats Directive 1992 and the Flora Protection Order species.

Policy NH12: Ensure that, where evidence of species that are protected under the Wildlife Acts 1976-2012, the Birds Directive 1979 and the Habitats Directive 1992 exists, appropriate avoidance and mitigation measures are incorporated into development proposals as part of any ecological impact assessment. In the event of a proposed development impacting on a site known to be a breeding or resting site of species listed in the Habitats Regulations or the Wildlife Acts 1976 -2012 a derogation licence, issued by DAHRRGA, may be required.

Policy NH13: Support measures for the prevention and/or eradication of invasive species within the county.

Policy NH14: Promote best practice with respect to minimising the spread of invasive species in the carrying out of development and to support measures for the prevention and / or eradication of invasive species within the county.

Policy NH15: Require, as part of the planning application process, the eradication/control of invasive introduced species including Japanese Knotweed, when identified on a site or in the vicinity of a site, in accordance with Regulation 49 of the European Communities (Birds and Natural Habitats) Regulations 2011 to 2015.

Policy GI8: Contribute towards the protection of and manage existing networks of woodlands, trees and hedgerows which are of amenity or biodiversity value and/or contribute to landscape character, and to strengthen local networks.

Policy GI12: Restrict the cutting of hedges during the bird-nesting season (1st March until 31st August), except in certain legally defined circumstances, in accordance with the provisions of the Wildlife (Amendment) Act 2000.

5.2 Study Methodology

This section details the steps and methodology employed to undertake an Ecological Impact Assessment of the Proposed Development.

5.2.1 Scope of Assessment

The specific objectives of the study were to:

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- Undertake baseline ecological surveys of the Site of the Proposed Development and evaluate the nature conservation importance of the Site and Zone of Influence of the Proposed Development Site;
- Identify and assess the direct, indirect, and cumulative ecological implications or impacts of the Proposed Development during its lifetime; and
- Where possible, propose mitigation measures to remove or reduce those impacts at the appropriate stage of development.

5.2.1.1 Zone of Influence

The 'zone of influence' (ZOI) for a project is the area over which ecological features may be affected by changes as a result of the Proposed Development and associated activities. This is likely to extend beyond the development site, for example where there are ecological or hydrological links beyond the site boundaries (CIEEM, 2018). The ZOI will vary with different ecological features, depending on their sensitivities to an environmental change. Given the nature and surrounding landscape of the Proposed Development, the ZOI is regarded to be relatively limited and within the redline boundary for most ecological receptors (with the exception of designated sites, e.g., European sites, Ramsar sites, Natural Heritage Areas and proposed Natural Heritage Areas – see below).

To determine the ZOI of the Proposed Development for *designated sites*, reference was made to the OPR Practice Note PN01 - 'Appropriate Assessment Screening for Development Management' (OPR, 2021), a practice note produced by the Office of the Planning Regulator, Dublin. This note was published to provide guidance on screening for appropriate assessment (AA) during the planning process, and although it focuses on the approach a planning authority should take in screening for AA, the methodology is also readily applied in the preparation of Biodiversity Chapters such as this to identify relevant designated sites potentially linked to the Proposed Development.

In addition, the guidance document published by the Department of Housing, Planning and Local Government (then DEHLG) 'Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities' (2009) was considered, which recommends an arbitrary distance of 15km as the precautionary ZOI for a plan or project being assessed for likely significant effects on European Sites, stating however that this should be evaluated on a case-by-case basis.

As such, the 15km ZOI is used in this report as an initial starting point for collating *designated sites* for this Biodiversity Chapter.

The methodology used to identify relevant designated sites comprised the following:

- Use of up-to-date GIS spatial datasets for designated sites and water catchments – downloaded from the NPWS website (www.npws.ie) and the EPA website (www.epa.ie) to identify designated sites which could potentially be affected by the Proposed Development;
- The catchment data were used to establish or discount potential hydrological connectivity between the project boundary and any designated sites.

- All designated sites within the ZOI (within 15km of the Proposed Development Site) were identified and are shown in Figure 5-2.
- The potential for connectivity with designated sites at distances greater than 15km from the Proposed Development was also considered in this initial assessment. In this case, there is no potential connectivity between the Proposed Development Site and designated sites located at a distance greater than 15km based on the Source-Pathway-Receptor model.

Table 5-6 provides details of all relevant designated sites as identified in the preceding steps. The potential for pathways between designated sites and the Proposed Development Site was assessed on a case-by-case basis using the Source-Pathway-Receptor framework as per the OPR Practice Note PN01 (March 2021). Pathways considered included:

- a. Direct pathways (e.g. proximity (i.e. location within the designated site), water bodies, air (for both air emissions and noise impacts).
- b. Indirect pathways (e.g. disruption to migratory paths, 'Sightlines' where noisy or intrusive activities may result in disturbance to shy species).

5.2.2 Desk Study

A desktop study was carried out to collate and review available information, datasets and documentation sources pertaining to the site's natural environment. The desktop study was completed in June 2022 and relied on the following sources:

- Information on species records and distributions, obtained from the National Biodiversity Data Centre (NBDC) at www.maps.biodiversityireland.ie ;
- Information on waterbodies, catchment areas and hydrological connections obtained from the Environmental Protection Agency (EPA) at www.gis.epa.ie ;
- Information on bedrock, groundwater, aquifers and their statuses, obtained from Geological Survey Ireland (GSI) at www.gsi.ie ;
- Information on the network of designated conservation sites, boundaries, qualifying interests and conservation objectives, obtained from the National Parks and Wildlife Service (NPWS) at www.npws.ie ;
- Satellite imagery and mapping obtained from various sources and dates including Google, Digital Globe, Bing and Ordnance Survey Ireland;
- Information on the existence of permitted developments, or developments awaiting decision, in the vicinity of the Proposed Development from Kildare County Council available at: <http://webgeo.kildarecoco.ie/planningenquiry>
- Information on the extent, nature and location of the Proposed Development, provided by the Applicant and/or their design team;
- The current conservation status of birds in Ireland taken from Gilbert et al. (2021).
- The pollinator friendly planting code provided by The All-Ireland Pollinator Plan (2021-2025) available at www.pollinators.ie
- Kildare County Development Plan 2017-2023



5.2.3 Field Surveys

A range of field surveys have been carried out at the Site of the Proposed Development to inform this Biodiversity Chapter. The following sections provide details of the field surveys carried out and a summary of ecological surveys is provided in Table 5-1.

Table 5-1: Summary of ecological surveys carried out at the Site.

Survey	Survey Date(s)	Surveyor
Habitat, Flora and Fauna Surveys	19 th May 2022, 1 st June 2022, 22 nd June 2022	Enviroguide Consulting
Non-volant Mammal Surveys	19 th May 2022	Enviroguide Consulting
Breeding Bird Surveys	19 th May 2022, 1 st June 2022	Enviroguide Consulting

5.2.3.1 Breeding Bird Surveys

Enviroguide Ecologist and Ornithologist Brian McCloskey carried out a breeding bird survey of the Site on two occasions: 19th of May 2022 and 1st of June 2022. The birds were surveyed by walking a number of transects along the boundaries and natural breaks within the Site (e.g., treelines) to cover the entire area of the Site of the Proposed Development. Each transect was divided up into four parts (all a similar distance) and the transect was walked with all species noted at each side of the ecologist. Distance brackets were also used and the majority of species were recorded inside the site boundary and within 50 meters each side of the surveyor on each transect.

5.2.3.2 Habitat and Flora surveys

A habitat survey was undertaken on the 19th of May 2022, with additional survey dates to cover later blooming flora on the 1st and 22nd of June 2022. Habitats were identified and classified according to Fossitt (2000) and Smith et al. (2011). Characteristic and rare/endangered plant species were noted and the Site was assessed for the presence of invasive plant species.

5.2.3.3 Non-volant Mammal Surveys

Mammal surveys of the Site were carried out in conjunction with the habitat and bird surveys. The Site was searched for tracks and signs of non-volant mammals (i.e., mammals which are incapable of flight). Bat surveys were carried out separately as described above. The habitat types recorded throughout the survey area were used to assist in identifying the fauna considered likely to utilise the area. During this survey, the Site was searched for tracks and signs of mammals as per Bang and Dahlstrom (2001).

5.2.3.4 Bats

No dedicated Bat Activity surveys were undertaken during the preparation of this Biodiversity Chapter. The Site and the habitats within were assessed for their potential for providing suitable roosting, commuting and/or foraging habitat for Irish bat species during the site visit on the 19th of May 2022.

5.2.3.5 General fauna surveys

The Site was assessed for the presence of fauna other than mammals and birds in conjunction with the habitat surveys undertaken on the 19th of May 2022, 1st of June 2022 and 22nd of June 2022. The site was searched for signs of aquatic fauna (incl. amphibians, fish and invertebrates), reptiles and rare/endangered invertebrates, and habitats were assessed for their potential suitability for same.

5.2.4 Assessment

The value of the ecological resources – the habitats and species present or potentially present was determined using the ecological evaluation guidance provided in the National Roads Authority's Ecological Assessment Guidelines (NRA, 2009). This evaluation scheme, with values ranging from locally important to internationally important, seeks to provide value ratings for habitats and species present that are considered ecological receptors of impacts that may ensue from a proposal (



Table 5-2). The NRA (2009) defines key ecological receptors as those ecological features which are evaluated as Locally Important (higher value) or higher, that are likely to be impacted significantly by the Proposed Development. Internationally important receptors would include Special Areas of Conservation (SAC) or Special Protected Areas (SPA) while those of national importance would include Natural Heritage Areas (NHA).

This evaluation scheme has been adapted here to assess the value of habitats and fauna within the Site of the Proposed Development. The value of habitats is assessed based on the condition, size, rarity, conservation, and legal status. The value of fauna is assessed on its biodiversity value, legal status, and conservation status. Biodiversity value is based on its national distribution, abundance or rarity, and associated trends.

Using the evaluation criteria as described above, the habitats and species identified as being present or potentially present were assessed. As per the NRA guidelines, impact assessment is only undertaken of Key Ecological Receptors (KERs).



Table 5-2: Description of values for ecological resources based on geographic hierarchy of importance (NRA, 2009b).

Importance	Criteria
International Importance	- 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation. - Proposed Special Protection Area (pSPA). - Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended). - Features essential to maintaining the coherence of the Natura 2000 Network - Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive. - Resident or regularly occurring populations (assessed to be important at the national level) of the following: - o Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or - o Species of animal and plants listed in Annex II and/or IV of the Habitats Directive - Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971). - World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972). - Biosphere Reserve (UNESCO Man & The Biosphere Programme) - Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979). - Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979). - Biogenetic Reserve under the Council of Europe. - European Diploma Site under the Council of Europe. - Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).
National Importance	- Site designated or proposed as a Natural Heritage Area (NHA). - Statutory Nature Reserve. - Refuge for Fauna and Flora protected under the Wildlife Acts. - National Park. - Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park. - Resident or regularly occurring populations (assessed to be important at the national level) of the following: - o Species protected under the Wildlife Acts; and/or - o Species listed on the relevant Red Data list. - o Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive

Importance	Criteria
County Importance	- Area of Special Amenity. - Area subject to a Tree Preservation Order. - Area of High Amenity, or equivalent, designated under the County Development Plan. - Resident or regularly occurring populations (assessed to be important at the County level) of the following: - o Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; - o Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; - o Species protected under the Wildlife Acts; and/or - o Species listed on the relevant Red Data list. - o Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance. - County important populations of species; or viable areas of semi-natural habitats; or natural heritage features identified in the National or Local BAP; if this has been prepared. - Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county. - Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.
Local Importance (higher value)	- Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared; - Resident or regularly occurring populations (assessed to be important at the Local level) of the following: - o Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; - o Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; - o Species protected under the Wildlife Acts; and/or - o Species listed on the relevant Red Data list. - Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality; - Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.
Local Importance (lower value)	- Sites containing small areas of semi-natural habitat that are of some local importance for wildlife; - Sites or features containing non-native species that is of some importance in maintaining habitat links.

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5.2.4.1 Impact Assessment Criteria

Once the value of the identified Key Ecological Receptors (KERs) was determined, the next step was to assess the potential effect of the Proposed Development on these KERs. This was carried out with regard to the criteria outlined in various impact assessment guidelines (NRA, 2009b; CIEEM, 2018) that set down a number of parameters such as quality, magnitude, extent and duration that should be considered when determining which elements of the Proposed Development could constitute impact or sources of impacts. Once impacts are defined, their significance was categorised using EPA Guidelines (EPA, 2022a).

Identification of a risk does not constitute a prediction that it will occur, or that it will create or cause significant impact. However, identification of the risk does mean that there is a possibility of ecological or environmental damage occurring, with the level and significance of the impact depending upon the nature and exposure to the risk and the characteristics of the ecological receptor.

5.2.4.2 Criteria used to define the quality, significance and duration of effects

In line with the EPA Guidelines (EPA, 2022a), the following terms are defined when quantifying the quality of effects. See Table 5-3.

Table 5-3: Definition of Quality of Effects

Quality	Definition
Positive Effects	A change which improves the quality of the environment (for example, by increasing species diversity, or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
Neutral Effects	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error
Negative/adverse Effects	An effect which causes noticeable changes in the character of the environment but without significant consequences. (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).

In line with the EPA Guidelines (EPA, 2022a), the following terms are defined when quantifying the significance of effects. See



Table 5-4.

Table 5-4: Definition of Significance of Effects

Significance of Effects	Definition
Imperceptible	An effect capable of measurement but without significant consequences.
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effects	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics

In line with the EPA Guidelines (EPA, 2022a), the following terms are defined when quantifying duration and frequency of effects. See Table 5-5.

Table 5-5: Definition of Duration of Effects

Quality	Definition
Momentary Effects	Effects lasting from seconds to minutes
Brief Effects	Effects lasting less than a day
Temporary Effects	Effects lasting less than a year
Short-term Effects	Effects lasting one to seven years.
Medium-term Effects	Effects lasting seven to fifteen years.
Long-term Effects	Effects lasting fifteen to sixty years
Permanent Effects	Effects lasting over sixty years
Reversible Effects	Effects that can be undone, for example through remediation or restoration

5.3 The Existing and Receiving Environment (Baseline Situation)

The following sections detail the baseline conditions at the Site of the Proposed Development that relate to ecology. A detailed description of the Proposed Development is provided in Chapter 2 – Description of Development.

5.3.1 Site Overview

The Proposed Development is situated in the Townland of Thomastown in the Barony of Carbury, in the Electoral Division of Cadamstown, Co. Kildare (Figure 5-1). The entrance to the Proposed Development is located along the L1522 off the R402.

Johnstown Bridge village is located ca. 1.7km to the east of the site and the village of Kilshanroe is 1.9 km to the south-west. The setting is predominantly rural with surrounding land uses of agriculture, forestry and a number of one-off residential dwellings and one-off commercial type facilities. The site is located approximately 2.5km from junction 9 on the M4 motorway.

The Proposed Development has a total area, including the access road, of 7.243 hectares (ha) (17.898 acres).

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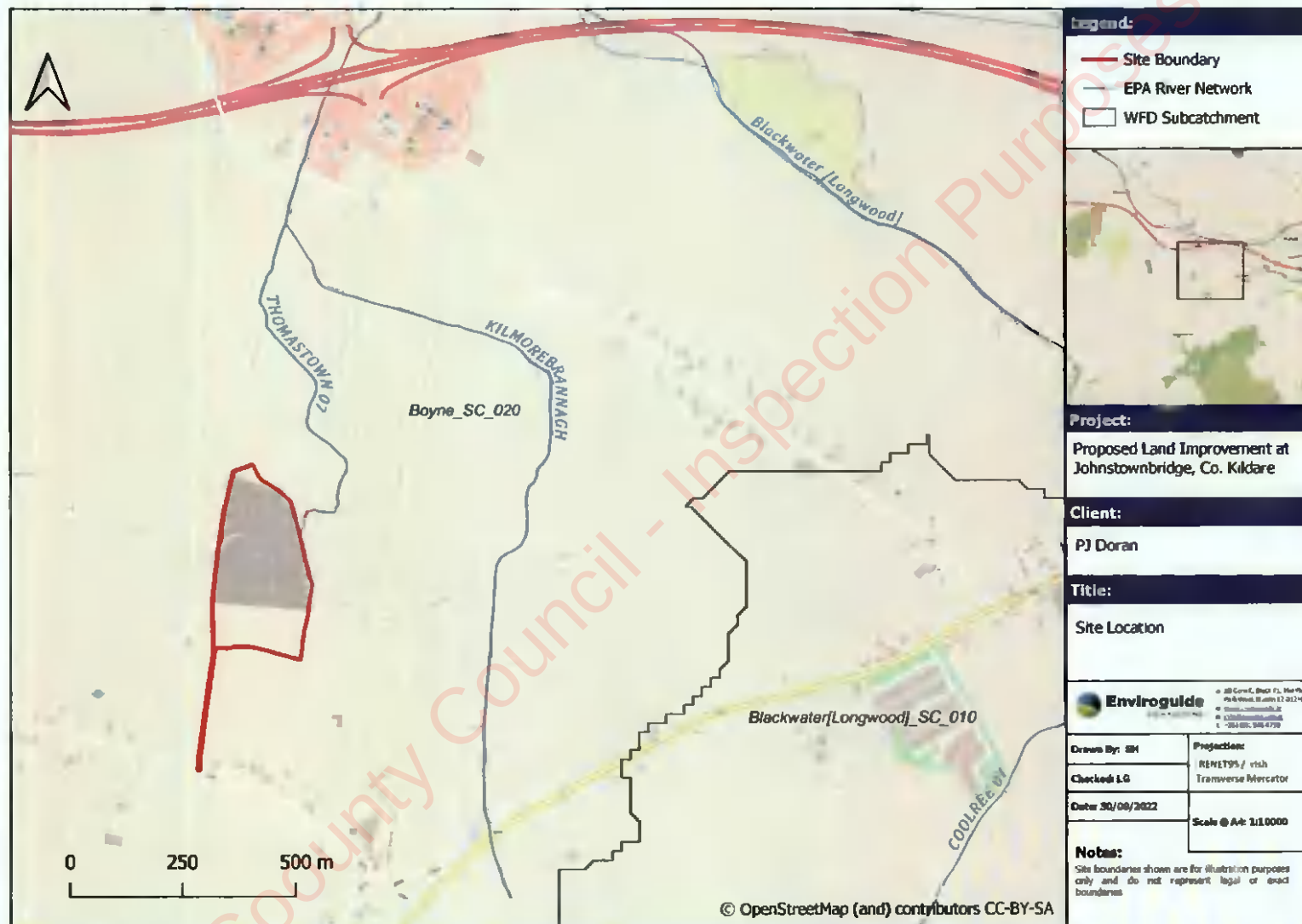


Figure 5-1: Site Location of the Proposed Development.

5.3.2 Hydrology

The site has been mapped by the EPA (EPA, 2022b) to be within the Boyne WFD Catchment (ID: 07), the Boyne Hydrometric Area (HA07), the Boyne_SC_020 Sub-Catchment, (Sub-catchment ID: 07_16) and the Blackwater(Longwood)_030 WFD River Sub Basin (European Code: IE_EA_07B020200).

The closest surface water feature to the Site is recorded on the EPA database (EPA, 2022b) as the Thomastown Stream (River Waterbody Code: IE_EA_07B020200). This stream has been assigned a *Moderate* ecological status based on expert judgement (EPA, 2022b). The Thomastown Stream adjoins the eastern boundary of the Site and flows north for approximately 0.96km before converging with the Kilmorebrannagh Stream (River Waterbody Code: IE_EA_07B020200). The Kilmorebrannagh Stream flows north for approximately 0.59km before converging with the Blackwater (Longwood) River (River Waterbody Code: IE_EA_07B020200). The Blackwater (Longwood) River flows north for approximately 12.16km before discharging to the River Boyne (River Waterbody Code: IE_EA_07B040900).

The Kilshanchoe River (River Waterbody Code: IE_EA_07B020300) is located approximately 1.22km west of the Site at its closest point and flows to the north before converging with the Blackwater (Longwood) River approximately 3.13km northeast of the Site.

For the Blackwater (Longwood) River, a Q-value of 3 was recorded in 2020 from Bridge at Johnstown, while approx. 5.6km downstream at 'Bridge ESE of Longwood' the Q-values in 2020 were recorded as 3-4 (EPA, 2022b). The Blackwater (Longwood) River has been projected to be *At risk* of not achieving its WFD objectives (EPA, 2022b).

The Royal Canal Main Line (Boyne) (EU Code: IE_07_AWB_RCMLE) is located approximately 1.31km north of the Site.

5.3.3 Geology and Hydrogeology

The Site is situated on the Trim (IE_EA_G_002) groundwater body. The WFD status of the Trim GWB is *Good* but is projected to be *At Risk* of not achieving its WFD objectives. The bedrock aquifer in the area is a 'Locally Important Aquifer - Bedrock which is Generally Moderately Productive'. The groundwater rock units underlying the aquifer are classified as Dinantian Upper Impure Limestones. The level of vulnerability to groundwater contamination from human activities varies from *Moderate* across the southern half of the Site, to *High* across the northern half (GSI, 2022). Majority of the Site contains the subsoil type Limestone sands and gravels (Carboniferous) except a narrow strip of *Limestone Till (Carboniferous)* at the southern border of the infill area, and the soil is classed as *Pastures* (EPA, 2022).

5.3.4 Designated Sites

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and wild fauna and flora by the designation of Special Areas of Conservation (SACs) and the Birds Directive (79/409/EEC) seeks to protect birds of special importance by the designation of Special Protection Areas (SPAs). It is the responsibility of each member state to designate SPAs and SACs, both of which will form part of Natura 2000, a network of protected sites throughout the European Community. SACs are selected for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. The annexed habitats and species for which each site is selected

correspond to the qualifying interests of the sites; from these the conservation objectives of the site are derived.

National Heritage Areas (NHAs) are designations under the Wildlife Acts to protect habitats, species, or geology of national importance. The boundaries of many of the NHAs in Ireland overlap with SAC and/or SPA sites. Although many NHA designations are not yet fully in force under this legislation (referred to as 'proposed NHAs' or pNHAs), they are offered protection in the meantime under planning policy which normally requires that planning authorities give recognition to their ecological value.

Table 5-6 presents details of the key ecological features of the designated sites within a 15km radius of the Proposed Development. The result of this preliminary screening concluded that there is a total of five SACs, one SPAs, three NHAs and ten pNHAs located within the ZOI of the Proposed Development Site Figure 5-2. The distances to each site listed are taken from the nearest possible point of the Proposed Development Site boundary to nearest possible point of each Natura 2000 site or pNHA.

Table 5-6: Designated sites within the precautionary Zone of Influence of the Proposed Development (15km)

Site Name & Code	Qualifying Interests (* = priority habitats)	Distance to Site
Special Areas of Conservation		
River Boyne And River Blackwater SAC (002299)	Alkaline fens [7230]; Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>) [91E0]; <i>Lampetra fluviatilis</i> (River Lamprey) [1099]; <i>Salmo salar</i> (Salmon) [1106]; <i>Lutra lutra</i> (Otter) [1355]	7.3 km
The Long Derries, Edenderry SAC (000925)	Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) [6210]	12.1 km
Ballynafagh Lake SAC (001387)	Alkaline fens [7230] <i>Vertigo moulinsiana</i> (Desmoulin's Whorl Snail) [1016]; <i>Euphydryas aurinia</i> (Marsh Fritillary) [1065]	12.2 km
Mount Hevey Bog SAC (002342)	Active raised bogs [7110]; Degraded raised bogs still capable of natural regeneration [7120]; Depressions on peat substrates of the <i>Rhynchosporion</i> [7150]	12.4 km
Ballynafagh Bog SAC (000391)	Active raised bogs [7110]; Degraded raised bogs still capable of natural regeneration [7120]; Depressions on peat substrates of the <i>Rhynchosporion</i> [7150]	12.9 km
Special Protection Areas		
River Boyne and River Blackwater SPA (004232)	<i>Alcedo atthis</i> (Kingfisher) [A229]	7.4 km

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Site Name & Code	Qualifying Interests (* = priority habitats)	Distance to Site
Natural Heritage Areas (NHAs)		
Carbury Bog NHA (001388)	Carbury Bog NHA is situated 4 km north of Carbury, almost entirely within the townlands of Ardkill, Carbury and Knockcor, County Kildare. Carbury Hill, which rises to 142 m, lies directly south of the bog. This site originally consisted of two lobes but much of the large north-west lobe is actively cutover and has been excluded from the site. Although occasional, the scarce bog moss <i>Sphagnum imbricatum</i> is present. The Red Data Book species Round-leaved Wintergreen (<i>Pyrola rotundifolia</i>) has been recorded from the woodland area along the abandoned railway line. Carbury Bog NHA is a site of considerable conservation significance comprising of raised bog, a rare habitat in the E.U. and one that is becoming increasingly scarce and under threat in Ireland. This site supports a good diversity of raised bog microhabitats including some hummock/hollow complexes, scrub and marginal deciduous woodland which add to the diversity and scientific value of the site.	5.5 km
Molerick Bog NHA (001582)	Molerick Bog NHA is situated approximately 4 km south-west of Longwood in the townlands of Molerick, Anneville and Blackshade Co. Meath. The site comprises a raised bog that includes both areas of high bog and cutover bog. The site is bounded by the Dublin-Sligo railway line to the north and local roads to the east. Molerick Bog NHA is a site of conservation significance comprising as it does a raised bog, a rare habitat in the E.U. and one that is becoming increasingly scarce and under threat in Ireland. This site is located in Co. Meath at the eastern extreme of raised bogs in Ireland and is one of only four raised bogs in the county.	9.6 km
Hodgestown Bog NHA (001393)	Hodgestown Bog NHA is located 4 km north-west of Prosperous, mostly in the townlands of Hodgestown, Coolearagh East and Garvoge in Co. Kildare. The site comprises a raised bog that includes both areas of high bog and cutover bog. Much of the site was burnt in the 1970s but a subsequent survey reported that the bog was recovering well with active <i>Sphagnum</i> regeneration. There was a swallow hole in the east of the bog, with an associated soak area where the bog mosses <i>S. palustre</i> and <i>S. recurvum</i> were recorded, but this area has now been cutover. The high bog is surrounded by cutover much of which has been planted with coniferous forestry, especially in the south and east of the site. Hodgestown Bog NHA is a site of considerable conservation significance comprising as it does a raised bog, a rare habitat in the E.U. and one that is becoming increasingly scarce and under threat in Ireland. This site supports a good diversity of raised bog microhabitats, including hummocks.	10.5 km
Proposed Natural Heritage Areas (pNHAs)²		
Royal Canal (002103)	The Royal Canal is a man-made waterway linking the River Liffey at Dublin to the River Shannon near Tarmonbarry. A number of different habitats are found within the canal boundaries - hedgerow, tall herbs, calcareous grassland, reed fringe, open water, scrub and woodland. The rare and legally protected Opposite-leaved Pondweed	1.3 km

² Where available, brief site synopses are provided for pNHA sites. These synopses are available from the NPWS (<https://www.npws.ie/protected-sites/nha>). It is noteworthy that these synopses are based on old survey data and may not accurately reflect the status of the site at the current time.

Site Name & Code	Qualifying Interests (* = priority habitats)	Distance to Site
	<i>Groenlandia densa</i> (Flora Protection Order 1987) is present at one site in Dublin, between Locks 4 and 5. <i>Tolypella intricata</i> (a stonewort listed in the Red Data Book as being vulnerable) is also in the Royal Canal in Dublin, the only site in Ireland where it is now found. The ecological value of the canal lies more in the diversity of species it supports along its linear habitats than in the presence of rare species. It crosses through agricultural land and therefore provides a refuge for species threatened by modern farming methods.	
Ballina Bog (000390)	No site synopsis available.	3.5 km
Ballynabarny Fen (001573)	No site synopsis available.	8.0 km
Rathmoylan Esker (000557)	No site synopsis available.	9.5 km
Grand Canal (002104)	The Grand Canal is a man-made waterway linking the River Liffey at Dublin with the Shannon at Shannon Harbour and the Barrow at Athy. A number of different habitats are found within the canal boundaries - hedgerow, tall herbs, calcareous grassland, reed fringe, open water, scrub and woodland. The rare and legally protected Opposite-leaved Pondweed <i>Groenlandia densa</i> (Flora Protection Order 1987) is present at a number of sites in the eastern section of the Main Line, between Lowtown and Ringsend Basin in Dublin. The ecological value of the canal lies more in the diversity of species it supports along its linear habitats than in the presence of rare species. It crosses through agricultural land and therefore provides a refuge for species threatened by modern farming methods.	10.0 km
Donadea Wood (001391)	No site synopsis available.	10.3 km
The Long Derries, Edenderry (000925)	Refer to qualifying interests of The Long Derries, Edenderry SAC.	12.1 km
Ballynafagh Lake (001387)	Refer to qualifying interests of Ballynafagh Lake SAC.	12.2 km
Mount Hevey Bog (001584)	Refer to qualifying interests of Mount Hevey Bog SAC.	12.4 km
Ballynafagh Bog (000391)	Refer to qualifying interests of Ballynafagh Bog SAC.	12.9 km

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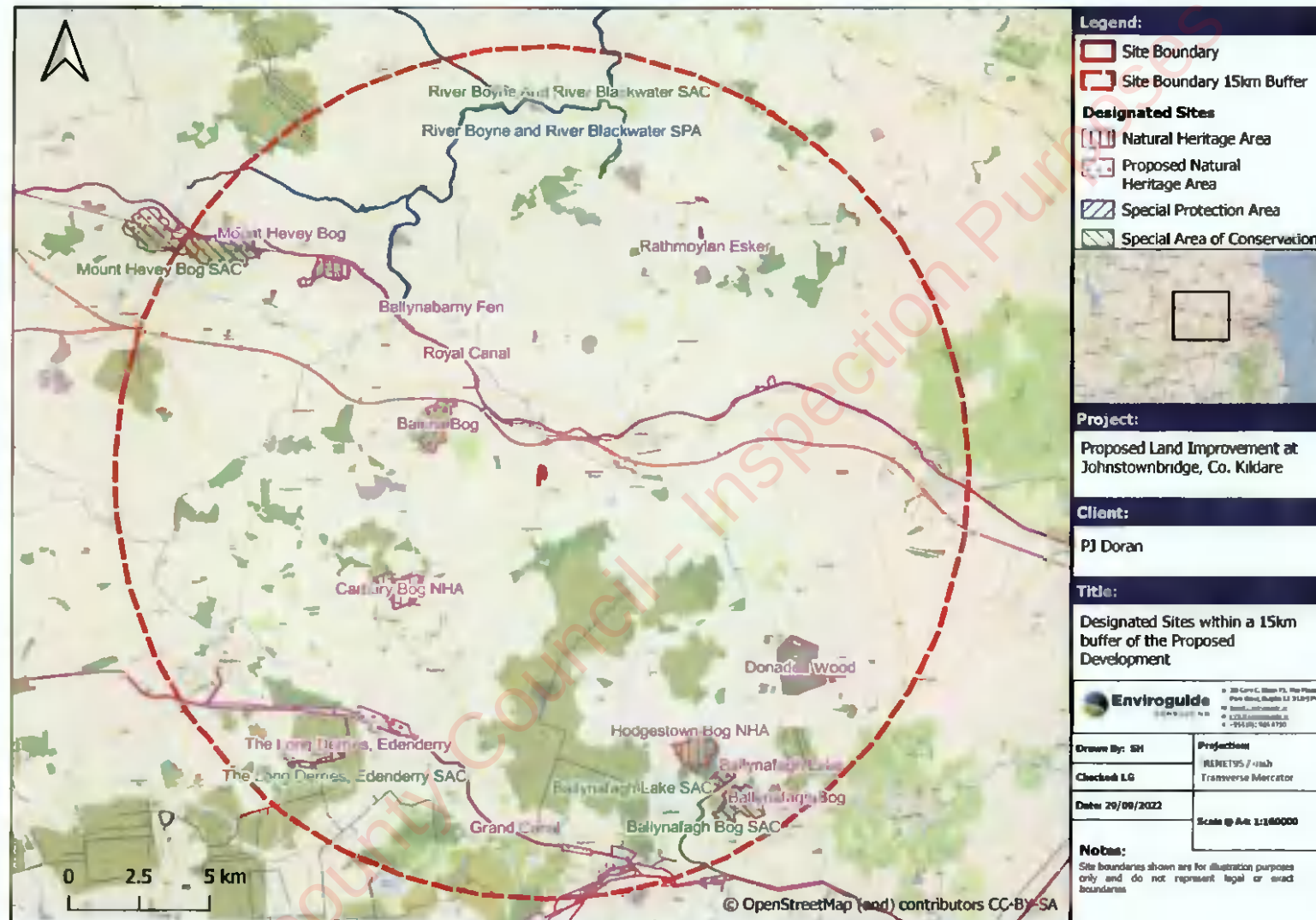


Figure 5-2: Designated sites within 15km of the Site of the Proposed Development

5.3.5 Habitats

The habitats within the Site of the Proposed Development were coded and categorised to level 3 according to Fossitt (2000). The following distinct habitat types were identified:

- WS1 – Scrub
- GS4 - Wet grassland
- ED3/GS4 - Recolonising bare ground/Wet grassland
- WN6 - Wet willow-alder-ash woodland
- GS2 - Dry meadows and grassy verges
- FL8 - Other artificial lakes and ponds
- ED3 - Recolonising bare ground
- ED2 - Spoil and bare ground
- WL1 – Hedgerow
- ED5 – Refuse and other waste

Additionally, two types of surface water features were identified adjacent to the Site, namely

- FW4 – Drainage ditch
- FW2 – Depositing/lowland rivers

A map of the habitats and ecological constraints at the Site is provided in Figure 5-3. The following paragraphs describe the habitats within the Proposed Development Site boundary.



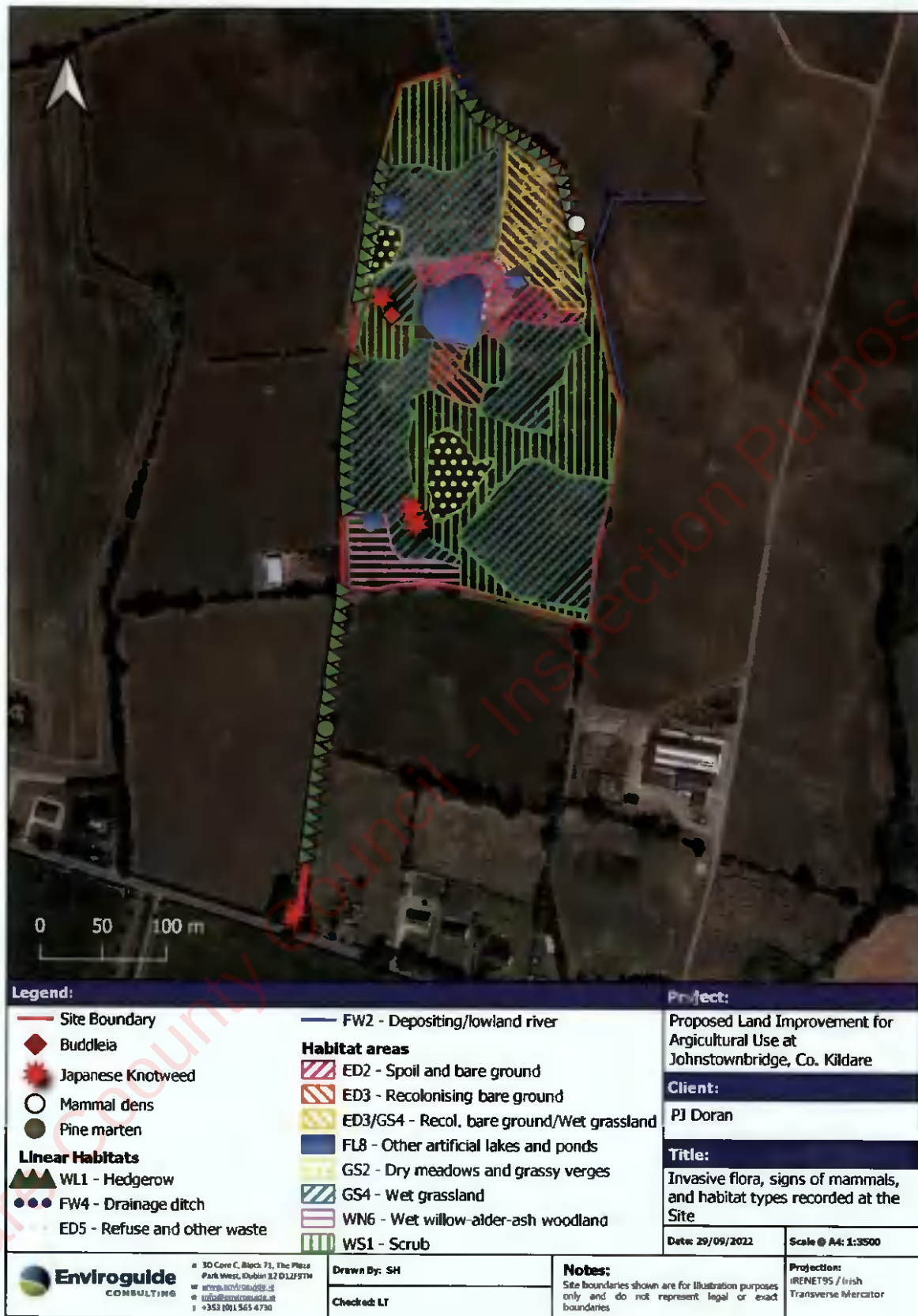


Figure 5-3: Habitats at the Site of the Proposed Development

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5.3.5.1 Scrub (WS1)

The largest continuous area of this habitat occurred just south of a central pond at the Site (Figure 5-4), with narrowing stretches reaching south and east forming part of the boundaries of the Site. This large area of scrub was largely impenetrable at the time of survey. Two areas of less dense scrub were found at the northwest corner of the Site, as well as just south of the access road where it enters the open Site area. Additionally, an earth mound covered in inaccessible scrub is present at the southeast corner of the central pond.



Figure 5-4: Example of inaccessible scrub habitat occurring at the Site.

The scrub habitats supported relatively similar flora across the Site, including Bramble *Rubus fruticosus*, Willow *Salix* sp., Gorse *Ulex europaeus*, Elder *Sambucus nigra*, Hazelnut *Corylus avellana*, Rape *Brassica napus*, Cleavers *Galium* sp., Hawthorn *Crataegus monogyna*, Silverweed *Potentilla anserina*, Dandelion *Taraxacum vulgaria*, Common Vetch *Vicia sativa* ssp. *segetalis*, Cock's Foot grass *Dactylis glomerata*, Ribwort Plantain *Plantago lanceolata*, Willowherb *Epilobium* sp., Rye Grass *Lolium* sp., Horsetail *Equisetum* sp., Honeysuckle *Lonicera periclymenum*, Thistle *Cirsium* sp., Creeping Buttercup *Ranunculus repens*, Meadow Buttercup *Ranunculus acris*, Germander Speedwell *Veronica chamaedrys* and Common Nettle *Urtica dioica*. Additionally, occasional patches of Hard Rush *Juncus inflexus* and Yellow Flag *Iris pseudacorus* were observed at the margins of the scrub habitat.

Several mammal trails were observed leading to/from these habitats.

5.3.5.2 Wet Grassland (GS4), Transitional Recolonising Bare Ground to Wet Grassland (ED3/GS4)

These habitat types occurred across the lower elevation areas of the Site (Figure 5-5), with the exception of the southeast corner where a drier version of this habitat was observed.

The wetter, lower lying areas found across the western half of the Site and between scrub habitats east of the central pond were largely dominated by Water Mint *Mentha aquatica*. The rest of the plant species growing within these wet habitats included Willow *Salix* sp., Dandelion *Taraxacum vulgaria*, Sedges *Carex* sp., Cuckoo Flower *Cardamine pratensis*, Creeping Buttercup *Ranunculus repens*, Horsetail *Equisetum* sp., Hard Rush *Juncus inflexus*, Soft Rush *Juncus effusus*, Cleavers *Galium* sp., Willowherb *Epilobium* sp., Bulrush *Typha latifolia*,

Yellow Flag *Iris pseudacorus*, Lesser Marshwort *Apium inuridatum*, Silverweed *Potentilla anserina*, Hogweed *Heracleum sphondylium* and Black Medick *Medicago lupulina*.



Figure 5-5: Example of Bulrush and Yellow Flag within the Wet Grassland (GS4) habitat found on the Site of the Proposed Development.

The drier, slightly elevated area of wet grassland (Figure 5-6) supported species more commonly found in drier habitats, such as Dock *Rumex* sp., Hard Rush *Juncus inflexus*, Soft Rush *Juncus effusus*, Cock's Foot grass *Dactylis glomerata*, Dandelion *Taraxacum vulgaria*, Common Sorrel *Rumex acetosa*, Cleavers *Galium* sp., Thistle *Cirsium* sp., Germander Speedwell *Veronica chamaedrys*, Common Nettle *Urtica dioica*, Ribwort Plantain *Plantago lanceolata*, Silverweed *Potentilla anserina* and Creeping Cinquefoil *Potentilla reptans*.

Several mammal trails were recorded crossing the drier of the wet grassland habitats, however it is likely that mammals also utilise the wetter areas, but no distinct trails remain due to the waterlogged nature of these habitats.



Figure 5-6: Drier of the Wet Grassland (GS4) habitats found on the Site during habitat surveys on the 19th of May 2022. Photo taken near the southeast corner of the Site, view towards north-northeast.

The northeast corner of the Site contained an area in the process of transitioning from Recolonising Bare Ground to the Wet Grassland habitat type, with plant cover turning developing to form similar habitat as the wetter wet grassland areas. Plant species found

within this transitional habitat included Water Mint *Mentha aquatica*, Willow saplings *Salix* sp., Creeping Cinquefoil *Potentilla reptans*, Ragwort *Senecio jacobaea*, Chamomile *Chamaemelum nobile*, Sedges *Carex* sp., Willowherb *Epilobium* sp., Horsetail *Equisetum* sp. and Cuckoo Flower *Cardamine pratensis*.

5.3.5.3 Wet willow-alder-ash woodland (WN6)

A wet woodland formed by mostly mature Willow *Salix* sp. trees is located at the southwest corner of the main Site area (Figure 5-7). Understory species included Dock *Rumex* sp., Meadow-grass *Poa* sp., Creeping Buttercup *Ranunculus repens*, Water Cress *Nasturtium officinale*, Herb Robert *Geranium robertianum*, Elder *Sambucus nigra*, Hogweed *Heracleum sphondylium*, Willowherb *Epilobium* sp., Speedwell species *Veronica* sp. and Common Nettle *Urtica dioica*. This habitat was bordered at its north edge by a small pond.



Figure 5-7: Wet Willow woodland (WN6) is pictured on the right in this photo image, bordered by a pond containing Horsetails *Equisetum* sp. and large rubble and silt substratum.

5.3.5.4 Dry meadows and Grassy Verges (GS2)

Two areas of dry meadows and grassy verges (GS2) were recorded on the Site, namely at the centre of the large central/southern scrub area, and immediately north of the access road where it enters the main Site area. The central meadow contained Dandelion *Taraxacum vulgare*, *Heracleum sphondylium*, Creeping Cinquefoil *Potentilla reptans*, Ribwort Plantain *Plantago lanceolata*, Thistle *Cirsium* sp., Willowherb *Epilobium* sp., Speedwell *Veronica* sp., and small saplings of Bramble *Rubus fruticosus* and Gorse *Ulex europaeus*.

The grassy verge north of the access road contained Nettle *Urtica dioica*, Creeping Buttercup *Ranunculus repens*, Meadow Buttercup *Ranunculus acris*, Dock *Rumex* sp., Sedges *Carex* sp., Thistle *Cirsium* sp., Cow Parsley *Anthriscus sylvestris*, Coltsfoot *Tussilago farfara* and Wild Strawberry *Fragaria vesca*.

5.3.5.5 Other artificial lakes and ponds (FL8) and waterlogged areas

The Site contained a number of ponds, with varying depths and biodiversity. The central pond was the deepest, with the fringe at the southeast corner largely formed by Horsetail *Equisetum* sp., and Willow *Salix* sp. growing around the pond on all sides Figure 5-8. Other species found

surrounding this pond were Clover *Trifolium sp.*, Ragwort *Senecio sp.*, Coltsfoot *Tussilago farfara*, Cuckoo Flower *Cardamine pratensis*, Buttercup *Ranunculus sp.*, Willowherb *Epilobium sp.* and Ribwort Plantain *Plantago lanceolata*. This pond also contained at least two active waterfowl nests, namely Coot *Fulica atra* and Moorhen *Gallinula chloropus*.

The ponds themselves were observed with a mix of aquatic plants, including Charophyte algae and Water Mint *Meritha aquatica*, and the small circular pond next to the central ponds contained Water-Crowfoot *Ranunculus sp.*



Figure 5-8: The central pond at the Site, with Horsetails *Equisetum sp.* growing in the forefront of the image

Many of the ponds and waterlogged areas were observed with deposits resembling tufa formations, which could indicate these areas are more representative of calcareous springs (FP1) and could support the Annex I priority habitat 'petrifying springs with tufa formation (*Cratoneurion*) (7220)'. However, as these areas have formed as a result of anthropogenic activity (i.e., sand pit quarrying) they are described here as FL8 – Other artificial lakes and ponds.

5.3.5.6 Recolonising bare ground (ED3), Spoil and bare ground (ED2)

An area of Recolonising bare ground was recorded south of the central pond, with Willow saplings *Salix sp.*, some Sedges *Carex sp.*, Coltsfoot *Tussilago farfara* and Dandelion *Taraxacum vulgaria*.

A larger area of Spoil and bare ground bordered the central pond on its north and east side, and a number of smaller spoil heaps not yet recolonised by vegetation were scattered across the Site within the wet grassland habitats. These spoil and bare ground areas contained only few species, including Dandelion *Taraxacum vulgaria* and Coltsfoot *Tussilago farfara*. The largest area contained a spoil heap with Long-headed Poppy *Papaver dubium*.

5.3.5.7 Hedgerow (WL1)

Hedgerow habitats bordered the access roadway on both sides and formed most of the western natural boundary of the main Site area (Figure 5-9). Additionally, approx. 160m of the northeast border was formed by hedgerow habitat.

The hedgerows along the access road were formed mostly by hawthorn, with a dense outside and hollow inside, making an excellent sheltered path for small mammals to use for commuting instead of the road itself. The other hedgerow habitats were more open, consisting of Hawthorn *Crataegus moriogyna*, Bramble *Rubus fruticosus*, Willow *Salix* sp., Gorse *Ulex europaeus*, Elder *Sambucus nigra* and varying degrees of herbaceous understory cover.



Figure 5-9: Example of hedgerow habitat (WL1) found at the Site. This photo is of the northeast boundary hedgerow.

5.3.5.8 Drainage ditches (FW4) and Depositing/Lowland rivers (FW2)

Drainage ditches and small depositing/lowland rivers habitats occur along the eastern and northern boundaries of the Site, adjacent to Site boundary (Figure 5-10). These habitats were not accessible from within the Site due to extensive vegetation and scrub cover along the boundaries. However, the Site areas are estimated to be connected to the east-side stream via drainage through the boundary scrub that is located directly east of the central pond. The drainage ditches lead away from the Site in the direction of the river Blackwater, however they are heavily overgrown with vegetation (incl. Rushes, Horsetails, Willowherbs) and therefore observations of the water surface were largely not possible. In one instance where the water was visible, no flow was observed. These ditches are likely to provide some biodiversity value to locally occurring amphibians and other aquatic fauna adapted to living in eutrophic waters.



Figure 5-10: Examples from the Thomastown Stream, adjacent to the Site on the eastern boundary. Central image shows instance where water surface was visible.

5.3.5.9 Refuse and other waste (ED5)

Several small skip sacks were observed to the east of the central pond, containing rubble and construction wastes (Figure 5-11). Additionally, a pile of old wood chippings occurs next to the smaller central pond.



Figure 5-11. Image showing the skip sacks at the eastern side of the central pond. Pile of wood chippings is visible on the right hand side of the image.

5.3.5.10 Evaluation of Habitats

The habitats found at the Site of the Proposed Development were evaluated as per the assessment method detailed in section 5.2.4. The results of this evaluation for each habitat type occurring at the Site are given in Table 5-7.



Table 5-7: Evaluation of habitats within the Proposed Development Site

Habitat	Evaluation	Rationale	Key Ecological Receptor (KER)
WS1 – Scrub	Local importance (higher value)	Important habitat type for a variety of species of bird, bat and mammal in terms of connectivity, shelter and foraging. Not proposed to be removed, disturbance unlikely due to buffer zones around infill areas.	No
GS4 - Wet grassland	Local importance (higher value)	Important habitat type for a variety of species of bird, bat and mammal in terms of connectivity and foraging. Important habitat type for invertebrates with fully or partially aquatic lifecycles.	Yes
WN6 - Wet willow-alder-ash woodland	Local importance (higher value)	Important habitat type for a variety of species of bird, bat and mammal in terms of connectivity, shelter and foraging. Not proposed to be removed, disturbance unlikely due to buffer zones around infill areas.	No
GS2 - Dry meadows and grassy verges	Local importance (lower value)	Relatively low ecological value in the local/site context, low diversity of flora. Some value as commuting/foraging habitat for mammals.	No
ED3/GS4 - Recolonising bare ground/Wet grassland	Local importance (lower value)	In the process of transitioning to wet grassland, currently relatively low biodiversity value.	No
FL8 - Other artificial lakes and ponds	Local importance (higher value)	Important habitat for a variety of species of waterfowl, small freshwater fish and aquatic invertebrates. Potentially supporting Annex I habitat type 'petrifying springs with tufa formation (Cratoneurion) (7220)'.	Yes
ED3 - Recolonising bare ground	Local importance (lower value)	Highly disturbed habitat with low biodiversity value.	No
ED2 - Spoil and bare ground	Local importance (lower value)	Highly disturbed habitat with low biodiversity value.	No
WL1 – Hedgerow	Local importance (higher value)	Important habitat type for a variety of species of bird, bat and mammal in terms of connectivity, shelter and foraging.	Yes
FW4 – Drainage Ditch FW2 – Depositing / lowland river	Local importance (higher value)	Important connection to the wider landscape and the river Blackwater	Yes
ED5 – Refuse and other waste	Negligible value	No biodiversity value.	No

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5.3.6 Species and species groups

The Site of the Proposed Development is located in the northwest corner of the Ordnance Survey Ireland National N73P 2km grid square. Due to the position of the Site and the general rural landscape of the area, tetrads N73J, N74F and N74K to the west, northwest and north of the N73P tetrad were also included in the desk study to form a custom 4km by 4km tetrad. Species records dated within the last 20 years from the National Biodiversity Data Centre (NBDC) online database for this custom tetrad were studied for the presence of invasive, rare or protected flore and fauna. These records are presented in *Table 5-8*.

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Table 5-8: National Biodiversity Data Centre records of rare, invasive and protected species in tetrads N73P, N73J, N74F and N74K.

Species Group	Name	Date of last record	Database	Legal Status	Cons status	BoCCI status ³
Invasive Flora	Japanese Knotweed <i>Fallopia japonica</i>	06/06/2021	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	High Impact Invasive Species Regulation S.I. 477 (Ireland)	-	-
	Sycamore <i>Acer pseudoplatanus</i>	25/04/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Medium Impact Invasive Species	-	-
Terrestrial Mammals (Native)	Eurasian Badger <i>Meles meles</i>	02/12/2018	Mammals of Ireland 2016-2025	WA	lc	-
	European Otter <i>Lutra lutra</i>	27/03/2015	General Biodiversity Records from Ireland	WA, HD	lc	-
	Pine Marten <i>Martes martes</i>	04/12/2021	Mammals of Ireland 2016-2025	WA, HD	lc	-
	Red Fox <i>Vulpes vulpes</i>	02/12/2018	Mammals of Ireland 2016-2025	-	-	-
	West European Hedgehog <i>Erinaceus europaeus</i>	29/04/2021	Hedgehogs of Ireland	WA	lc	-
Terrestrial Mammals (non-native)	European Rabbit <i>Oryctolagus cuniculus</i>	20/04/2014	Atlas of Mammals in Ireland 2010-2015	Medium Impact Invasive Species	-	-
Amphibian	Common Frog <i>Rana temporaria</i>	13/03/2020	Amphibians and reptiles of Ireland	WA, HD	lc	-
Birds	Chaffinch <i>Fringilla coelebs</i>	04/01/2017	Birds of Ireland	WA	-	Green
	Common Blackbird <i>Turdus merula</i>	04/01/2017	Birds of Ireland	WA	-	Green
	Common Buzzard <i>Buteo buteo</i>	01/08/2021	Birds of Ireland	WA	-	Green
	Eurasian Jay <i>Garrulus glandarius</i>	01/12/2017	Birds of Ireland	WA	-	Green

Birds of Conservation Concern in Ireland 2020-2026 (Gilbert et al. 2021), available at: <https://birdwatchireland.ie/birds-of-conservation-concern-in-ireland/>

Species Group	Name	Date of last record	Database	Legal Status	Cons status	BoCCI status ³
	Eurasian Tree Sparrow <i>Passer montanus</i>	04/01/2017	Birds of Ireland	WA	-	Amber
	European Greenfinch <i>Carduelis chloris</i>	04/01/2017	Birds of Ireland	WA	-	Amber
	European Robin <i>Erithacus rubecula</i>	04/01/2017	Birds of Ireland	WA	-	Green
	Northern Wheatear <i>Oenanthe oenanthe</i>	22/08/2021	Birds of Ireland	WA	-	Amber
	Pied Wagtail <i>Motacilla alba</i> subsp. <i>yarrellii</i>	29/10/2014	Birds of Ireland	WA	-	Green
	Reed Bunting <i>Emberiza schoeniclus</i>	04/01/2017	Birds of Ireland	WA	-	Green
	Rook <i>Corvus frugilegus</i>	29/10/2014	Birds of Ireland	WA	-	Green
	Song Thrush <i>Turdus philomelos</i>	04/01/2017	Birds of Ireland	WA	-	Green
	Yellowhammer <i>Emberiza citrinella</i>	11/07/2021	Birds of Ireland	WA	-	Red

*Codes used in the 'legal status' column are as follows: HD – species that are protected under Annexes II, IV or V of the EC Habitats Directive 1993; BD – species that are listed on Annex I of the EC Birds Directive; WA – species that are protected under the Wildlife Act 1976 (as amended); OSPAR – species listed by OSPAR as threatened and/or declining; FPO – species listed on the Flora Protection Order 2015, which receive protection under the Wildlife Act 1976 (as amended).

** Codes in the 'conservation status' column refer to national red lists, using the following supplementary categories: RE (regionally extinct), CR (critically endangered), EN (endangered), VU (vulnerable), NT (near-threatened), LC (least concern), DD (data deficient) or N.A. (not assessed) and/or recent assessments of the status of habitats and species in Ireland (NPWS, 2019), using the following categories: favourable, inadequate, bad, unknown.

*** With the exception of terrestrial mammals and amphibians, species with "near-threatened", "least concern", "data deficient" and "not assessed" conservation status are not listed. The conservation status of non-native flora and fauna is not listed.

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5.3.6.1 Flora

Rare and Protected Flora

Species records from the NBDC online database were studied for the presence of rare or protected flora species. No rare or protected flora were listed within the tetrad associated with the Site. In addition, no rare or protected flora were recorded at the Site.

Invasive Plant Species

The NBDC have records of two invasive plant species within the tetrad associated with the Proposed Development Site. One species within the relevant grid squares is listed under Schedule III of Regulation S.I. 477, namely Japanese Knotweed (JK) *Fallopia japonica*. JK is a *High impact* invasive species (Kelly et al. 2013). The other invasive recorded within the relevant tetrads, Sycamore *Acer pseudoplatanus*, was not found on the Site during the site surveys in May and June 2022.

JK was recorded at two locations at the Site of the Proposed Development during the site surveys on the 19th of May and 1st of June 2022: few plants were growing just inside the entrance by the main road, and a larger stand (approx. 30m x 5m) was recorded within the southern half of the main Site area, between the south-central scrub and wet grassland habitats (Figure 5-12). An additional growth of JK was recorded during the site visit on the 22nd of June 2022 south of the access road on the main site area. Additionally, a small bush of Butterfly bush (*Buddleia davidii*) was recorded during the site visit on the 22nd of June 2022, near the JK. Butterfly bush is a *Medium impact* invasive species (Kelly et al. 2013).



Figure 5-12: Photo of extensive Japanese Knotweed stand (red rectangle), located between the southern wet grassland and scrub areas. Inset shows approximate location of stand (filled white rectangle) within the Site.

5.3.6.2 Non-volant mammals

Five native non-volant mammals are recorded within the relevant tetrads, namely Eurasian Badger *Meles meles*, European Otter *Lutra lutra*, Pine Marten *Martes martes*, Red Fox *Vulpes vulpes* and West European Hedgehog *Erinaceus europaeus*. The Site does not provide suitable habitat for Otter (e.g., sufficient freshwater habitat/prey), however it is deemed that there is suitable habitat for the remaining species at the Site.

Evidence of mammal activity was noted during the field surveys carried out in May and June of 2022. Several mammal tracks were observed within the wet grassland, scrub and hedgerow habitats across the Site. A number of small dens or burrows (likely to belong to rabbits) were observed along majority of the boundary habitats. The larger scrub habitats were mostly inaccessible at the time of the surveys and thus it was not possible to determine whether mammals actively inhabit these habitats. However, mammal tracks were observed leading into the scrub habitats across the Site.

A number of Fox scats were observed across the Site, while smaller scat likely from Hedgehog were observed along the edges of the wet grassland and scrub habitats. A potential Badger scat was also recorded and photographed near the central scrub habitat by the hydrology team while on site surveying on the 4th of May 2022. Additionally, a single Pine Marten was observed utilising the hedgerows (likely commuting) along the access road from the main road to the main Site area during the breeding bird survey on the 19th of May 2022.

5.3.6.3 Bats

No bat species have been recorded within the relevant tetrads by the NBDC. The NBDC maps landscape suitability for bats based on Lundy et al. (2011) (Table 5-9). The index ranges from 0 to 100 with 0 being least favourable and 100 most favourable for bats (highest scores in Ireland currently approx. 58.556). The scores are divided into five qualitative categories of suitability, namely

- 0.0000000 - 13.0000000: **Low**
- 13.0000001 - 21.333300: **Low - Medium**
- 21.333301 - 28.111099: **Medium**
- 28.111100 - 36.444401: **Medium - High**
- 36.444402 - 58.555599: **High**

The overall habitat suitability index for bats is 24.22 (Medium) for the 2km grid squares N73P and N73J, and 27.22 (Medium) for the 2km grid squares N74F and N74K. This difference is likely attributable to the Blackwater (Longwood) river located within the N74F and N74K grid squares.



Table 5-9: Landscape Suitability Index values for native Irish bat species. The qualitative score is indicated by score colour as per the abovementioned scale (source: NBDC).

Bat Species	Suitability index per 2 km grid reference			
	N73P	N73J	N74F	N74K
<i>Pipistrellus pygmaeus</i>	37	37	41	41
<i>Plecotus auritus</i>	29	29	34	34
<i>Pipistrellus pipistrellus</i>	43	43	47	47
<i>Rhinolophus hipposideros</i>	0	0	0	0
<i>Nyctalus leisleri</i>	36	36	42	42
<i>Myotis mystacinus</i>	13	13	11	11
<i>Myotis daubentonii</i>	27	27	30	30
<i>Pipistrellus nathusii</i>	5	5	8	8
<i>Myotis nattereri</i>	28	28	32	32
All bats	24 22	24 22	27 22	27 22

As the Site is located in a rural area with extensive hedgerows and potentially suitable roosting habitats within the wider landscape (e.g., old farm buildings, mature trees, etc.), it is unlikely to be entirely devoid of bat activity. A preliminary assessment of the Site in terms of suitable habitats for bat roosting, foraging and/or commuting was undertaken during the Site visit on the 19th of May 2022. The ponds, scrub and hedgerow habitats provide potentially suitable foraging and commuting habitat for any locally occurring bat populations. No potentially suitable bat roosting habitats were recorded at the Site of the Proposed Development during the Site visit.

5.3.6.4 Birds

Two breeding bird surveys were undertaken to obtain a comprehensive baseline for the Site. The first survey commenced on the morning of the 19th of May 2022 at the Site of the Proposed Development, while the second survey commenced on the morning of 1st of June 2022. During each survey, five transects were walked through the site to record all the species on the site. A combined total of 36 species were recorded during these two Breeding Bird Surveys. These species are listed in Table 5-10.

Each transect was divided up into four parts (all a similar distance) and the transect was walked with all species noted at each side of the ecologist. Distance brackets were also used, however, due to the lack of suitable habitat outside of the site, the majority of species were recorded inside the site boundary and within 50 meters each side of the surveyor on each transect.

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Table 5-10: Bird species recorded at the Site of the Proposed Development during surveys in May and June 2022.

Species	Scientific name	BOCCI Status	Survey * (1 / 2 / 1&2)
Blackbird	<i>Turdus merula</i>	Green	1&2
Blackcap	<i>Sylvia atricapilla</i>	Green	1&2
Blue Tit	<i>Cyanistes caeruleus</i>	Green	1&2
Chaffinch	<i>Fringilla coelebs</i>	Green	1&2
Chiffchaff	<i>Phylloscopus collybita</i>	Green	1&2
Coot	<i>Fulica atra</i>	Yellow	1&2
Dunnoek	<i>Prunella modularis</i>	Green	1&2
Goldcrest	<i>Regulus regulus</i>	Yellow	1&2
Goldfinch	<i>Carduelis carduelis</i>	Green	1&2
Great Tit	<i>Parus major</i>	Green	1&2
Grey Heron	<i>Ardea cinerea</i>	Green	1&2
Hooded Crow	<i>Corvus cornix</i>	Green	1&2
House Martin	<i>Delichon urbicum</i>	Yellow	1&2
Jackdaw	<i>Corvus monedula</i>	Green	1&2
Lesser Redpoll	<i>Carduelis cabaret</i>	Green	1&2
Linnet	<i>Carduelis cannabina</i>	Yellow	1&2
Mallard	<i>Anas platyrhynchos</i>	Yellow	1&2
Magpie	<i>Pica pica</i>	Green	1&2
Mistle Thrush	<i>Turdus viscivorus</i>	Green	1&2
Moorhen	<i>Gallinula chloropus</i>	Green	1&2
Meadow Pipit	<i>Anthus pratensis</i>	Red	1&2
Peregrine	<i>Falco peregrinus</i>	Green	2 only
Pied Wagtail	<i>Motacilla alba yarrellii</i>	Green	1&2
Robin	<i>Erithacus rubecula</i>	Green	1&2
Reed Bunting	<i>Emberiza schoeniclus</i>	Green	1&2
Rook	<i>Corvus frugilegus</i>	Green	1&2
Sand Martin	<i>Riparia riparia</i>	Yellow	1&2
Siskin	<i>Spinus spinus</i>	Green	1 only
Starling	<i>Sturnus vulgaris</i>	Yellow	1&2
Swallow	<i>Hirundo rustica</i>	Yellow	1&2

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Species	Scientific name	BOCCI Status	Survey * (1 / 2 / 1&2)
Song Thrush	<i>Turdus philomelos</i>	Green	1&2
Whitethroat	<i>Curruca communis</i>	Green	1&2
Woodpigeon	<i>Columba palumbus</i>	Green	1&2
Wren	<i>Troglodytes troglodytes</i>	Green	1&2
Willow Warbler	<i>Phylloscopus trochilus</i>	Yellow	1&2
Yellowhammer	<i>Emberiza citrinella</i>	Red	1&2

*) To denote which date bird was surveyed on: 1 = 19th May, 2 = 1st of June, 1&2 = both dates

5.3.6.5 Fish

The freshwater ponds and waterlogged areas at the northern half of the Site were observed to support small fish (likely Three-spined stickleback *Gasterosteus aculeatus*). The small stream running along a section of the northeast boundary is unlikely to support fish due to extensive vegetation and limited depth, however it was not possible to verify this due to the level of vegetation.

5.3.6.6 Amphibians

Both adults and tadpoles of the Common Frog *Rana temporaria* were recorded during the Site survey on 19th of May 2022. Although there are no records of the Smooth Newt *Lissotriton vulgaris* within the relevant tetrads associated with the Proposed Development, the Site contains habitat potentially suitable for this species (e.g., shallow freshwater ponds suitable for breeding, terrestrial habitat for adults).

5.3.6.7 Reptiles

No evidence of reptiles was observed during the Site visits on the 19th May 2022, or on either June date (1st and 22nd June 2022). Weather conditions and time of day during the site visits were suitable for potential observations of the Common Lizard (*Lacerta vivipara*), which needs to warm up by "sunning" due to its ectotherm physiology. No observations of the Common Lizard were made during the site visits.

Additionally, the Site is not considered to contain sufficient suitable habitat for the Common Lizard due to the wetness across the overall site. Small pockets of drier land with suitable "sunning" spots (e.g., dry rocks, sand) exist, but these are not considered extensive enough for supporting any significant numbers of the Common Lizard.

5.3.6.8 Invertebrates

No invertebrate species listed under the Habitats Directive were recorded within the tetrad associated with the Proposed Development by the NBDC.

A variety of terrestrial and aquatic invertebrates were observed, as well as invertebrates with a freshwater stage in their lifecycle were recorded through the Site. The terrestrial invertebrates included butterflies, bumblebees, flies, etc., while the aquatic/partly aquatic species included Dragonflies, Damselflies, Caddisfly *Trichoptera* (larvae), Great Diving Beetle

Dytiscus circumflexus (larvae), Water Scorpion *Nepa Cinerea* and Backswimmers *Notonecta* sp.

5.3.6.9 Evaluation of Species and Species groups

The species and species groups found at the Site of the Proposed Development were evaluated as per the assessment method detailed in section 5.2.4. The results of this evaluation for each species or group of species occurring or likely occurring at the Site are given in Table 5-11.



Tabla 5-11: Evaluation of species at the Proposed Development Site

Species	Evaluation	Key Ecological Receptor (KER)	Rationale
Invasive Flora	Invasive species (no conservation value)	Yes	The extent of the JK stands within the Site, and their designation as a <i>High impact</i> invasive listed on Schedule III of Regulation S.I. 477.
Eurasian Badger <i>Meles meles</i>	Local importance (higher value)	Yes	Possibly occur within the scrub habitats on Site.
European Otter <i>Lutra lutra</i>	Local importance (lower value)	No	No suitable habitat or sufficient prey for this species within the Site. Adjacent stream too small to support Otter.
Pine Marten <i>Martes martes</i>	Local importance (higher value)	Yes	Single individual observed during bird survey, likely to inhabit scrub and hedgerow habitats on Site.
Red Fox <i>Vulpes vulpes</i>	Local importance (higher value)	Yes	Not strictly protected in Ireland, but Foxes are possibly breeding at the Site.
West European Hedgehog <i>Erinaceus europaeus</i>	Local importance (higher value)	Yes	Not directly recorded at the Site but scat observed and suitable habitat is present for this species.
Rabbit	Local importance (lower value)	No	Not protected in Ireland. Potential burrows recorded within the Site.
Bat assemblage	Local importance (higher value)	Yes	Various species likely to forage and commute through the Site, using scrub, hedgerow and pond habitats.
Bird assemblage	Local importance (higher value)	Yes	Red, Amber and Green-listed species recorded within a range of habitats across the Site.
Fish	Local importance (higher value)	Yes	Small fish recorded in shallow ponds, likely to provide a food source for other fauna (e.g., Grey Heron).
Amphibians	Local importance (higher value)	Yes	Adult and tadpoles of Common Frog recorded on Site, suitable habitat present for smooth newt. Also likely to provide a food source for other local fauna (e.g., Grey Heron).
Reptiles	Local importance (lower value)	No	Limited suitable habitat at the Site, any Common Lizards occurring at the Site are considered to be of Local importance (lower value).
Invertebrates	Local importance (lower value)	No	Provide a potential food source for amphibians, birds and bats across their freshwater and terrestrial life stages. No rare or protected species recorded at the Site during site surveys.

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5.3.7 Conservation evaluation

5.3.7.1 Proposed Development Site

The main ecological value of the Development Site comes from the variety of semi-natural habitats it contains in the middle of a relatively monotonous agricultural landscape. Heterogenous habitats tend to support higher levels of biodiversity by containing a more varied plant component, which in turn promotes a more diverse animal and invertebrate assemblage. The wet grassland habitats support a high floral content in the local context, which promotes a relatively high biodiversity and density of pollinators and other insects. This in turn promotes insectivorous birds, (e.g., Goldcrest, House Martin, Meadow Pipit, Sand Martin, Swallow, Willow Warbler, Starling), as well as any locally occurring bat species. In addition, the island-like nature of the Development Site within the agricultural landscape has likely further promoted an increase in the overall species richness within the Site area, relative to the surrounding areas.

The extensive scrub and hedgerow habitats provide nesting and foraging habitat for local bird populations and shelter and potential nesting habitat for local mammals, such as Fox, Hedgehog and Pine Marten. These habitats may also support foraging bats in the area. While no definitive badger signs (setts, latrines, snuffle holes) were recorded during the Site surveys in May and June, a potential badger scat was recorded by the hydrology team on the 4th of May 2022. The Site contains habitats suitable for badger, which were inaccessible during the Site surveys in May and June of 2022.

The freshwater ponds at the Site contain relatively clear water, and the absence of high levels of vegetation suggests these ponds are not currently impacted by high levels of nutrient inputs via run-off from the surrounding agricultural lands, that would typically cause eutrophication (excess nutrient loading) and excessive vegetation. In their current state, these ponds have a high biodiversity value; they provide nesting and foraging habitat for waterfowl (e.g., Coot and Moorhen), habitat for fish, and support a variety of aquatic invertebrates and plant species. These ponds also have foraging potential for bats like Daubenton's Bat (*Myotis daubentonii*), which prefers to forage above calm water features. Frog were also recorded on Site, both adults and tadpoles, during the Site surveys, confirming the Site is being used as breeding habitat by the Common Frog. Although no Smooth Newt were recorded during the Site survey, the shallower freshwater ponds on Site provide potentially suitable habitat for this species.

Japanese Knotweed *Fallopia japonica* was observed on the Development Site at two locations: next to the entrance gate from the main road, and within the southern half of the Site next to the central-south scrub area. This species is listed in Schedule III of the *European Communities (Birds and Natural Habitats) Regulations 2011* (SI 477 of 2011, as amended), therefore any operations near this species must take extra precautions to prevent any potential spread of the species. Ideally, this species will be removed from the Site by a licenced operator prior to commencement of infill works.

Ecological features (habitats and species) present on the Proposed Development Site were evaluated for their conservation importance having regard for the National Roads Authority's scheme (NRA, 2009b). Habitats and species are evaluated based on their conservation status, distribution and the estimated population size or importance. The outcome of this evaluation exercise is presented in

Table 5-7 and

Table 5-11

Overall, the Proposed Development Site has been evaluated as of *Local importance (higher value)* having regard for the conservation evaluation scheme (NRA 2009) as a site “*containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality*”.

5.3.7.2 Natural Heritage Areas and Proposed Natural Heritage Areas

No NHAs or pNHAs are expected to be impacted by the Proposed Development, as there are no significant direct or indirect pathways between the Site and the NHAs and pNHAs within the ZOI of the Proposed Development.

5.3.7.3 European Sites

European sites are evaluated as having international importance (

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Table 5-2). A Screening for Appropriate Assessment for the Proposed Development, prepared in accordance with the requirements of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011) as amended and the Planning and Development Act, 2000, is presented separately to this EIAR. The following conclusion is extracted from the Appropriate Assessment Screening Report:

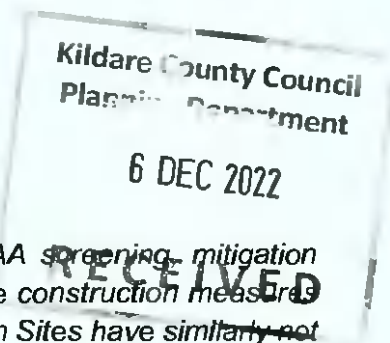
"The Proposed Development consisting of Land Improvement for Agricultural Use at Johnstownbridge, Co. Kildare, has been assessed taking into account:

- the nature, size and location of the proposed works and possible impacts arising from the construction works.*
- the qualifying interests and conservation objectives of the European sites*
- the potential for in-combination effects arising from other plans and projects.*

*In conclusion, upon the examination, analysis and evaluation of the relevant information and applying the precautionary principle, it is concluded by the authors of this report that, on the basis of objective information; the possibility **may be excluded** that the Proposed Development will have a significant effect on any of the European sites listed below:*

- River Boyne And River Blackwater SAC (002299)*
- The Long Derries, Edenderry SAC (000925)*
- Ballynafagh Lake SAC (001387)*
- Mount Hevey Bog SAC (002342)*
- Ballynafagh Bog SAC (000391)*
- River Boyne and River Blackwater SPA (004232)*

As such, no further assessment is required. In carrying out this AA screening, mitigation measures have not been taken into account. Standard best practice construction measures which could have the effect of mitigating any effects on any European Sites have similarly not been taken into account."



5.4 Characteristics of the Proposed Development

5.4.1 General Description

The Proposed Development comprises the importation of material to in-fill and re-contour a site which was previously quarried. The Applicant proposes, subject to the grant of permission, to import clean greenfield soil, subsoil and stone to remediate approximately 3.689ha of the total site. The 3.689ha is divided into two distinct areas – Area 1 is 2.718ha and Area 2 is 0.971ha. A fill plan has been drawn up for the importation of 68,970m³ of soil to fill Area 1, and 16,670m³ to fill Area 2, equating to a total of 85,640m³ (ca. 128,460 tonnes) of soil and subsoil. A volume to weight conversion factor of 1.50 is taken from the Waste Management (Landfill Levy) Regulations, 2008, SI 199 of 2008. The surface layer will comprise of 300mm of topsoil which will be graded to an even surface finish. It is proposed even out the levels of the site in order to allow for the safety of grazing animals. Once the importation is complete the Applicant will seed the land in line with Teagasc guidelines and return it to agricultural use. The proposed new levels and fill plan are detailed in Drawings P-01 to P-07 prepared by Enviroguide Consulting, 2022 (refer to Appendix A).

Once planning permission is obtained, it is intended to apply to Kildare County Council for a Waste Facility Permit. Material will be accepted in accordance with the conditions of the permit. As part of the Environmental Management Plan a register of incoming materials for the site will be maintained at all times. The only List of Waste (LoW) code accepted on site will be 17 05 04 - *Soil and Stones other than those mentioned in 17 05 03*.

It is proposed to accept material onto the site from 08.00 until 18.00 Monday to Friday and 08.00 to 14.00 on Saturday. It is not proposed to operate on Sundays or Bank Holidays.

Temporary welfare facilities will be located in the northeast of the site as per Figure 2-2, Site Layout Plan and harvested rainwater will be used in the wheel wash or for dust suppression.

Soil will be imported using Heavy Goods Vehicles from contractors authorised to transport waste, coming from a known source which has previously been inspected. In the interest of maintaining quality of incoming material the number of contractors delivering material to the site will be limited to a single contractor. Prior to deposition the consignment note for each load will be inspected by the site supervisor to ensure that the material is acceptable, and each load will be evaluated in accordance with the site's waste acceptance procedure.

The site has the potential to import inert soil and stones for land improvement for agriculture uses and will also improve drainage. As the site elevations decrease from across the site, with the most acute declines located to the north, it is proposed to raise the northern, central and southern sections of the site to come in line with the boundary elevations, refer to Drawings P-04 and P-05 for elevations. The proposed plant will consist of a tracked bulldozer for placing the soil and compressing it to a level that will permit good drainage. An excavator may be brought on to site from time to time to construct internal haul roads.

Thus, the focus of the proposed filling is concentrated in the central and eastern areas of the site. Cut and fill cross sections for the Proposed Development are attached as part of this planning application (refer to drawings included as Appendix A). Details of existing ground level, proposed change in elevation and final fill level are detailed in Drawings P-01 to P-07. It is proposed to carry this work out over a 5-year period, subject to the availability of appropriate soil, to allow the soil to settle naturally with minimal compaction. The soil and subsoils will be mixed, to minimise compaction and improve drainage.

Filling operations will be confined to a selected area of the site at any one time with each area being restored in a timely manner from commencement of the next phase.

A 10-meter buffer and silt fence will be maintained along the eastern boundaries of the site where no soil importation will take place to protect surface waters and to ensure that there are no offsite nuisances created by the site.

The re-profiling of the surface will be carried out to allow for the planting of native grassland as recommended by Teagasc. The re-profiling works will be supervised by a qualified landscape architect to ensure that the filling is carried out in a manner that will derive maximum benefit from this.

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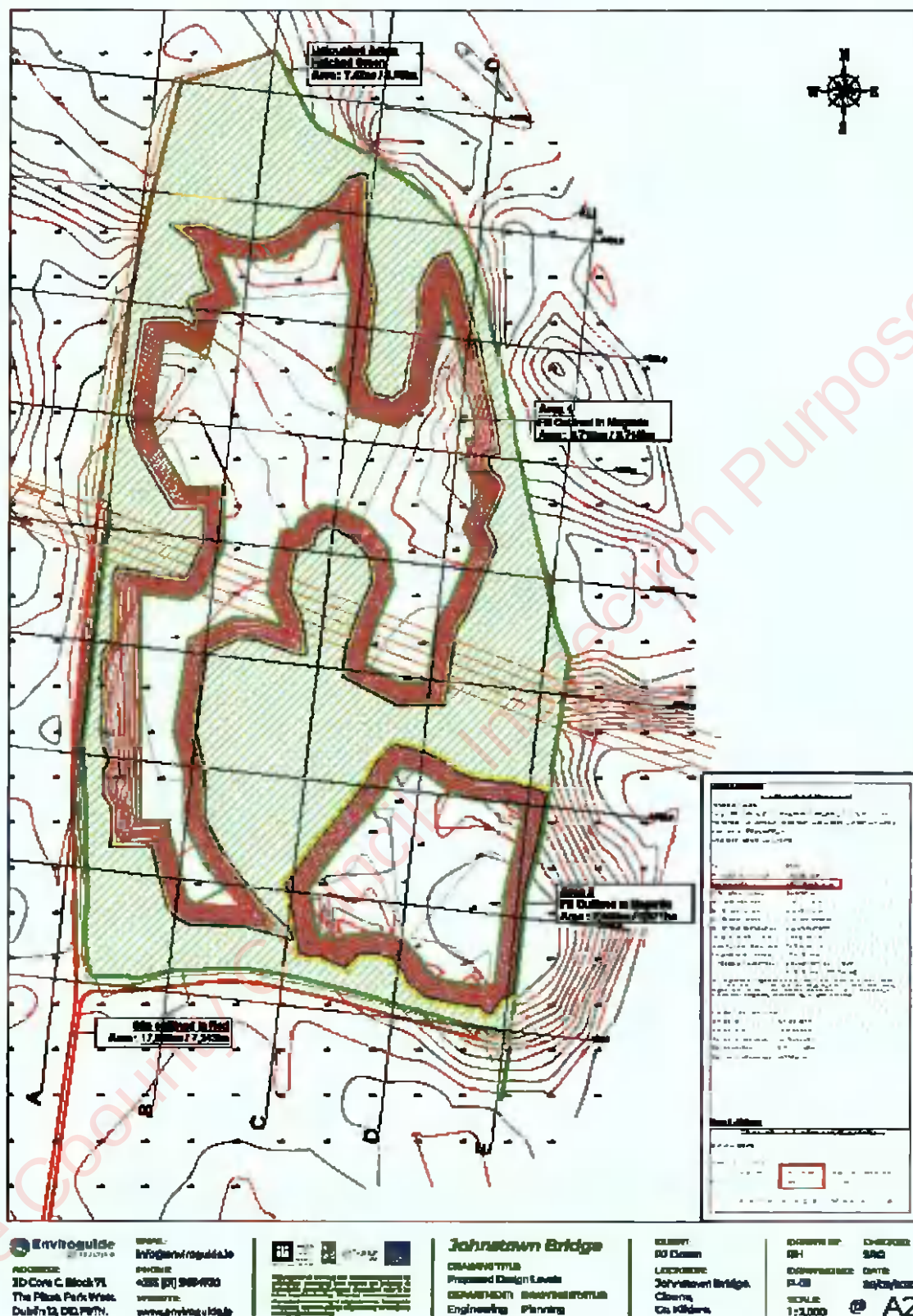


Figure 5-13: Proposed infill extent (Enviroguide, 2022)

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5.5 Potential Impact of the Proposed Development

5.5.1 Identified Sources for Potential Impacts

5.5.1.1 Construction Phase

There are no significant construction works proposed at the Site with limited excavation and regrading of soil required. The site office and welfare facilities, and the weighbridge and wheel washing facilities will be prefabricated and delivered to Site.

5.5.1.2 Operational Phase

Once planning is obtained, it is intended to apply to KCC for a waste facility permit. Subject to grant of permission, only clean soil and subsoil from greenfield development sites will be accepted in accordance with the conditions of the permit. The only EWC code accepted on site will be 17 05 04 - Soil and Stones other than those mentioned in 17 05 03*.

An Environmental Management System (EMS) will be developed for the Proposed Development and control and mitigation requirements will be strictly implemented for the duration of the Operational Phase to mitigate any potential impact on the KERs identified in Table 5-7 and Table 5-11. As part of the EMS a register of incoming materials for the site will be maintained at all times.

Mitigation measures will be adopted as part of the construction works on the Proposed Development site. These measures are considered to be best practice construction techniques that are applicable to most developments of this scale and nature. The measures will address the main activities of potential impact which include:

- Control and Management of Water and Surface Runoff;
- Management and control of imported soil and aggregates from off-site sources;
- Fuel and Chemical handling, transport, and storage; and
- Accidental release of contaminants – notify relevant statutory authorities.

As part of the overall infill methodology, sediment and water pollution control risks arising from surface water discharges related to infill activities will be considered. All works carried out as part of these works will comply with all Statutory Legislation including the Local Government (Water Pollution) acts, 1977 and 1990 and the contractor will cooperate fully with the Environment Section of Kildare County Council in this regard.

5.5.2 Potential Impacts on Designated Sites

The Proposed Development is not expected to result in significant adverse impacts on any Designated Sites (i.e., SACs, SPAs, NHAs or pNHAs) within the ZOI of the Site. The distances between the Designated Sites and the Proposed Development are sufficient to exclude the potential for significant adverse impacts via land, air or hydrological pathways arising from the infill works and operation of HGVs and heavy plant on the Site of the Proposed Development.

5.5.3 Habitats within the Proposed Development Site

The habitats listed as KERs within the Site of the Proposed Development include:

- GS4 - Wet grassland
- WL1 – Hedgerow

- FL8 - Other artificial lakes and ponds
- FW4 – Drainage ditch
- FW2 – Depositing / lowland river

5.5.3.1 Habitat loss

The Proposed Development will result in the loss of approximately 2.5 ha of habitat assessed as local importance (higher value) as per the NRA (2009b) scheme. This includes areas of Wet Grassland (approx. 2.3 ha), and three of the more permanent ponds at the Site amounting to approx. 0.2 ha. Additionally, the significance of the impacts from habitat loss is increased by the potential occurrence of Annex I priority habitats within the ponds and waterlogged areas (namely, '*petrifying springs with tufa formation (Cratoneurion)* (7220)', see section 5.3.5.5 for details) destined for infilling. Therefore, the impact of the Proposed Development due to the removal/infill of these habitats is assessed as negative, permanent, significant at a local scale due to their uniqueness within the wider landscape context.

5.5.3.2 Damage to Root zones

The boundary habitats consist mostly of hedgerows. These hedgerows may be negatively impacted if infill works, including the operation of heavy plant and HGVs, takes place within the Root Protection Area of the tree and hedge species forming the hedgerows. The potential impact on trees and hedge plants within the hedgerows from damage to roots constitutes a negative, long-term, slight impact at a local scale.

5.5.3.3 Surface water discharges

The waters within the ponds and waterlogged areas of the Site that are outside of the infill area, as well as the drainage ditch and small stream located adjacent to the eastern boundary, are at risk to be negatively impacted by potential surface water run-off from the infill. In the event of heavy rainfall, inputs of greenfield that are recently deposited near these sensitive areas could introduce excess silt and sediment into these freshwater features and have a negative, short-term, significant impact on the water quality of these habitats.

5.5.4 Risk of spreading Invasive species

The Site contains in total two stands of Japanese Knotweed (JK); a small stand near the access point to the main Site area, and an extensive stand within the southern areas of the Site. Additionally, a small stand is located just inside the entrance gate from the main road, however this falls outside of the Site boundary.

In the absence of mitigation and/or prevention measures, HGV traffic and plant operation associated with the infilling of the Site areas has the potential to run over the existing JK stands and thereby spread it both within the Site and outside of it. Worst case scenario would see fragments of JK being transported over long distances on HGVs and other machinery used at the Site. This constitutes a negative, long-term, significant impact at a local to county scale.

The infill will consist of clean greenfield inputs only, however there is a low risk of accidental spread of new invasive species to the Site areas through these inputs. This risk constitutes a negative, long-term, slight impact at a local scale.

5.5.5 Fauna

The faunal species and species groups identified as KERs include:

- Non-volant mammals
- Bat Assemblage
- Bird Assemblage
- Fish & Amphibians

5.5.5.1 Non-volant Mammals

The negative impacts to terrestrial mammals will be largely a result of habitat loss and disturbance. One mammal of conservation concern (Pine Marten *Martes martes*) was directly observed within the Site of the Proposed Development, while indirect evidence of other mammals of conservation concern, such as Hedgehog and Badger scat, was also recorded on Site. These three mammal species are all listed on the Red List of Mammals in Ireland (Marnell et al., 2019). Due to the limited size of the Proposed Development Site, the population of these species utilising the Site is anticipated to be relatively small, however in the local context this Site provides one of few suitable, semi-natural and relatively undisturbed habitat areas for these species. It is likely that these species use the scrub, hedgerow and woodland habitats for nesting/resting, while the open wet grassland areas provide good foraging and commuting habitat. Furthermore, the hedgerows leading away from the Site provide good ecological corridors to the wider landscape. In addition to these species of conservation concern, multiple Red Fox *Vulpes vulpes* scats were recorded across the Site, however Foxes are not afforded legal protection in Ireland.

The loss of the natural and semi-natural habitats at the Site used for commuting and foraging by these species is likely to have an adverse impact on the conservation status of the local populations of the Pine Marten, Hedgehog and Badger. There is little similarly undisturbed habitat in the vicinity of the Site. The Proposed Development could therefore have a negative, permanent, moderate effect at a local level on the aforementioned mammal species.

Noise and dust disturbance from the infilling activities, as well as the heightened risk of injury/mortality due to HGV traffic to and from the Site, has the potential to cause negative, short-term, moderate effects to mammals at a local level.

5.5.5.2 Bats

The Site provides a relatively large area of semi-natural and natural habitat types that are scarce within the wider landscape. These habitats, namely the scrub, hedgerows, wet grasslands and ponds, provide suitable foraging and commuting habitat for local bat populations. The wet grasslands contain a relatively high floral component in comparison to the wider landscape, and therefore currently supports a higher insect and pollinator diversity than the surrounding agricultural landscapes. This in turn is expected to attract more bats to forage in the area. The Proposed Development will lead to the Site being eventually used as pastureland, which typically has a lower diversity of flora than the current habitats occurring at the Site. Thus, removal of some or all of these habitats has the potential to have a negative, permanent, moderate impact on local bat populations through the direct loss of suitable bat foraging and commuting habitats.

In addition, dust and noise from the infilling activities could cause disturbance to any locally occurring bats that are resting/roosting within the retained hedgerows/scrub and trees at the Site. This constitutes a potential negative, short-term, slight impact on locally occurring bats.

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5.5.5.3 Birds

Although local birds are likely adapted to a certain degree of rural noise and activity (e.g., tractors, livestock), the infilling activities of the Proposed Development will likely involve elevated noise levels associated with plant operation and HGV traffic at the Site. As a result, there is a potential risk of noise disturbance to birds in the vicinity of the Site, representing a negative, short-term, slight impact.

There are several areas of dense scrub and hedgerows present at the Site, with several bird species recorded utilising these habitats. Additionally, waterfowl was recorded nesting in the pond. Should any of the vegetation within these habitats be cleared as part of the set-up and infilling activities during the breeding bird season (March 1st to August 31st), there is the potential for nesting birds to be harmed and nests to be destroyed. Additionally, ground nesting species (e.g., Meadow Pipit) may be present in the drier grassland areas. This would be in contravention of the Wildlife Acts and Amendments (2000) which provides protection to breeding bird species and their nests and young. Therefore, in the absence of any mitigation or precaution, this risk represents a potential negative, short-term, significant impact to breeding birds at a local scale.

Some loss of nesting habitat will also occur, as waterfowl were observed nesting within the large central pond and ground nesting species were recorded within the grassland areas destined for infill. Ground nesting species at the Site may be displaced for the duration of the Proposed Development (i.e., five years for infill activities), however these species have abundant nesting habitat in the form of agricultural pastures within the wider landscape. The waterfowl at the Site will be permanently displaced from the Site as the retained ponds are not sufficient to support the same number of nests as observed during Site visits. Therefore, the impact on local bird populations from loss of nesting habitat is considered to be negative, short-term, moderate.

5.5.5.4 Fish & Amphibians

The infilling of three of the more permanent ponds at the Site will likely cause mortality of fish and aquatic invertebrates within the ponds, as these ponds are not visibly connected to other water features. Additionally, the majority of the Site is confirmed as breeding habitat for the Common Frog. Amphibians will theoretically be capable of escaping from the ponds as they can move over land. Additionally, it is possible there are unknown underground channels between the ponds that would allow some of the fully aquatic fauna to migrate between the retained and infilled ponds. However, in the absence of detailed information or knowledge of such features, and without specific measures to minimise impact on amphibians during infilling, the potential impact from the infilling of these ponds on the local aquatic and semi-aquatic fauna is considered to be negative, short-term, significant.

The loss of habitat is considered to have a negative, permanent, moderate impact on the local fish and other aquatic fauna.

There is potential for negative impacts on fish and amphibians within the retained habitats at the Site as well as on fish potentially present in the small stream located adjacent to the Site, due to potential contaminated surface water run-off arising at the Proposed Development Site. Silt/sediment run off from recently infilled areas can result in increased turbidity of receiving surface waters. Hydrocarbon spillages can lead to direct lethal effects or sub-lethal effects on aquatic fauna. Due to the disconnected and locally unique nature of the ponds and

waterlogged areas at the Site, the potential impact on fish and amphibians is deemed to be **negative, short-term, moderate** at a **local** scale.

5.5.6 Potential Cumulative Impacts

5.5.6.1 Existing planning permissions

A search of planning applications located within the vicinity of the Site of the Proposed Development was conducted using online planning resources such as the National Planning Application Database (NPAD) (MyPlan.ie) and KCC's Planning Applications Map Viewer (<http://webgeo.kildarecoco.ie/planningenquiry>). Any planning applications listed as granted or decision pending from within the last five years were assessed for their potential to act in-combination with the Proposed Development and cause likely significant effects on the relevant European Sites. Long-term developments granted outside of this time period were also considered where applicable.

It is noted that the majority of developments within the vicinity of the Site of the Proposed Development are applications granted for new build dwellings and/or agricultural buildings. No developments with the potential to result in likely significant in-combination effects to any Designated Sites within the ZOI or any KER were identified. The larger, more recent applications are detailed below:

Reg. Ref. 191018, ca. 320m southeast of the Site, Granted Permission on 13/08/2020:

Importation of clean topsoil and subsoil into the subject site of 4.29 hectares at Kilmurry, Johnstown Bridge, Co. Kildare, in order that the site can be rendered suitable for agriculture. It is proposed to improve approximately 3.79 ha of the site and it is estimated that this will require approximately 62457 cubic metres of greenfield, inert soil and stone. The applicant also proposes to install a temporary site office and canteen, wheelwash, portaloo and carry out all ancillary site works. The application relates to an activity requiring a Waste Facility Permit from Kildare County Council. Revised by significant further information consisting of; an Environmental Impact Assessment Report (EIAR) has been submitted.

Reg. Ref. 171192, ca. 130m west of the Site. Granted Permission on 06/03/2018:

Amendments to development previously approved under Planning Register Reference 16/660 for a storey and a half / dormer type dwelling to include the following; revised location of proposed dwelling on family landholding from the approved set back distance of 211m to a reduced set back distance of 30.4m measured from the public road. reduction in floor area from 337.6sqm to 267.9sqm, omission of single storey utility room to side, minor elevational amendments, and all associate site works (note that the location of the "aquamax" waste water treatment system and sand polishing filter will remain as approved under Planning Register Reference 16/660).

5.5.6.2 Relevant Plans and Policies

The following policies and plans were reviewed and considered for possible in-combination effects with the Proposed Land Improvement.

- Kildare County Development Plan (CDP) 2017-2023
- Kildare County Development Plan (CDP) 2023-2029 Draft

Both County Development Plans have directly addressed the protection of European sites through specific policies and objectives. The Natura Impact Report for the Kildare CDP Draft

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2023-2029 concludes that *"the Plan itself, subject to it securing the mitigation detailed in this report, will not adversely affect the integrity of any European Site either alone or in combination with other plans or projects"*. Furthermore, the draft plan contains a Chapter dedicated Biodiversity and Green Infrastructure, with an policies to *"Integrate in the development management process the protection and enhancement of biodiversity and landscape features wherever possible, by minimising adverse impacts on existing habitats (whether designated or not) and by including mitigation and/or compensation measures, as appropriate"* and to *"ensure that any new development proposal does not have a significant adverse impact, incapable of satisfactory mitigation on plant, animal or bird species which are protected by law"*.

As such, it can be concluded that there is no potential for cumulative impacts with the above listed plans on any ecological receptors.

5.5.7 "Do Nothing" Impact

If the Proposed Development was not to go ahead, habitats at the Site of the Proposed Development would continue to evolve. The scrub habitat would likely encroach further into the wet grassland until the ground becomes too wet to support these more terrestrial plant species. The wet grasslands would become denser with moss cover and plants that thrive in waterlogged and saturated ground, while the shallow ponds are likely to gradually get overgrown by vegetation due to enrichment from the surrounding agricultural lands. The recolonising bare ground habitat and dry meadows and grassy verges habitats would likely transition to scrub. The Site would likely continue to be used by various fauna such as bats, birds, fox, badger, pine marten and hedgehog.

5.6 Avoidance, Remedial & Mitigation Measures

The above sections outlined a range of potential impacts of the Proposed Development in the absence of mitigation measures. Potential impacts arising from the site preparation and infill activities include:

- Water quality impacts within the Site and surrounding landscape arising from surface water run-off and potential groundwater flows
- Natural and semi-natural habitat loss
- Damage to retained habitats from infill activities
- Spread of invasive alien flora during infill activities
- Disturbance and/or mortality of non-volant mammals within the Site during infill activities
- Disturbance to bats within the Site and potential loss of foraging and/or commuting habitat during infill activities
- Disturbance and/or mortality of birds within the Site, loss of potential ground nesting habitat during infill activities
- Disturbance and/or mortality of fish and amphibians within the Site and the adjacent Thomastown Stream during infill activities

The following sections detail mitigation and avoidance measures to address the above impacts.

5.6.1 Protection of Surface water

Surface water discharges from the Site will not be permitted onto the Thomastown Stream nor into the drainage ditches along the eastern and northern boundary of the Site.

A 10-meter buffer and silt fence will be maintained along the eastern boundaries of the site where no soil importation will take place to protect surface waters and to ensure that there are no offsite nuisances created by the site.

In addition, the following measures will be undertaken:

- Run-off from the infilling site or any areas of exposed soil will be channelled and intercepted at regular intervals for discharge to silt-traps or lagoons with over-flows directed to land rather than to surface water features.
- A regular review of weather forecasts of heavy rainfall will be conducted, and a contingency plan will be prepared for before and after such events to minimise any potential nuisances. As the risk of the break-out of silt laden run-off is higher during these weather conditions, no infilling activity will be carried out during such periods where possible.
- Any imported materials will, as much as possible, be placed on Site in their proposed location and double handling will be avoided. Where this is not possible designated temporary material storage areas will be used.
- These temporary storage areas will be surrounded with silt fencing to filter out any suspended solids from surface water arising from these materials.
- All containment and treatment facilities will be regularly inspected and maintained.
- Refuelling of plant during the infilling activities will only be carried out at designated refuelling station locations on site. Each station will be fully equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed before the commencement of works on site.
- Only emergency breakdown maintenance will be carried out on site. Drip trays and spill kits will be available on site to ensure that any spills from vehicles are contained and removed off site.
- All personnel working on site will be trained in pollution incident control response.
- There will be no storage or handling of deleterious materials such as lubricants, oils etc. at the Site
- All associated waste from portaloos and Site facilities will be removed from the Site by a licenced waste disposal contractor.
- Under no circumstances will any untreated wastewater generated onsite (from equipment washing etc.) be released into nearby ditches or the Thomastown Stream.

5.6.2 Groundwater Mitigation

The ponds at the Site destined for infilling are fed by groundwater (for details please see Chapter 6 – Hydrology). Measures set out to protect surface water above regarding storage and usage of hazardous substances (e.g. fuels) on site will also serve to protect soil and groundwater. Additionally, the infilling of the open waterbodies will include the following additional mitigation measures:

- In advance of restoration works, the open waterbodies should be infilled to a depth of up to 0.5m with clean round gravel to act as a filter medium for silt removal;
- The infilling of the open water bodies will be undertaken in advance of restoration works across remaining areas of the Site;
- All works will be executed so as to minimise the suspension of solids;
- Any machines working in the vicinity of the open waterbodies will be protected against leakage or spillage of fuels, oils, greases and hydraulic fluids;

Any displaced water during the infilling of the open waterbodies will be allowed to infiltrate to ground in the immediate surrounding area. Where required, drainage runoff controls such as settlement tanks, silt fences and silt traps will be temporarily provided. Displaced water will not be permitted to enter the Thomastown Stream.

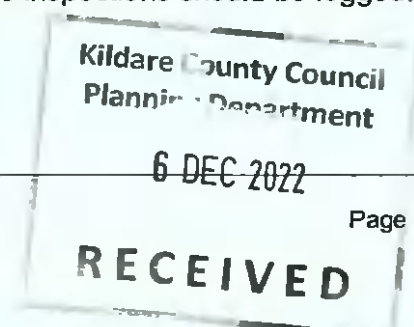
Furthermore, where a pollution incident is detected, infilling works will be stopped until the source of the pollution has been identified and remedied.

5.6.3 Dust Minimisation Plan

The objective of dust control at the site is to ensure that no significant nuisance occurs at nearby sensitive receptors, including the scrub and freshwater habitats at the Site. To avoid high levels of dust deposits on these habitats arising from the infilling activities at the Site, the following measures will be strictly adhered to:

- Where practicable, movements of large volumes of material will not be carried out in periods of dry and windy weather unless suitable mitigation measures are implemented;
- In the event of prolonged dry weather, rotary atomisers and water bowsers will be employed to dampen material and avoid dust suspension;
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind and shorten the length of time for which material will be stockpiled;
- Cover stockpiles to prevent wind whipping;
- Harvested rainwater will be used as a wheel wash for dust suppression to ensure dust is not transferred to external roads;

Additionally, regular inspections of the infill area buffer zone and boundary habitats will be carried out to monitor dust, and records and notes on these inspections should be logged.



5.6.4 Reduction of Noise Impacts

Short-term increases in disturbance levels as a direct result of human activity and through increased generation of noise during the infilling activities can have a range of impacts depending upon the sensitivity of the ecological receptor, the nature and duration of the disturbance and its timing.

Noise generated during the Operational Phase (i.e., infilling activity) of the Proposed Development could cause temporary disturbance to a number of faunal species in the vicinity of the Site of the Proposed Development. To mitigate this disturbance, the following measures will be implemented:

- Selection of plant with low inherent potential for generating noise.
- Siting of plant as far away from sensitive receptors as permitted by site constraints.
- Avoidance of unnecessary revving of engines and switch off plant items when not required.
- Keep plant machinery and vehicles adequately maintained and serviced.
- Proper balancing of plant items with rotating parts.
- Keep internal routes well maintained and avoid steep gradients.
- Monitoring typical levels of noise during critical periods and at sensitive locations (e.g., during bird breeding season and next to scrub habitats).

These measures will ensure that any noise disturbance to nesting birds or any other fauna species in the vicinity of the Site of the Proposed Development will be reduced to a minimum.

5.6.5 Protection of Retained Habitats

The infill plan excludes all of the existing scrub and woodland areas and provides for a buffer zone between the infill areas and the retained habitats. No operation of HGVs or infill plant will be allowed within this buffer zone. This will serve to protect the Root Zone of any retained trees and hedgerow species.

5.6.6 Biosecurity

5.6.6.1 Pre-Construction Japanese Knotweed Removal

An extensive Japanese Knotweed (JK) stand was recorded within the southern area of the Site, with an additional small stand just south of the access road inside the main Site area, and another outside of the Site boundary at the access gate from the main road. This species is listed in Part 1 of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011, as amended). No other invasive species listed on Schedule III of the above-mentioned regulations were found at the Site.

The JK found at the Site will be removed by a specialist JK consultant prior to commencing any infilling activities at the Site. Additionally, a JK Management plan will be submitted to KCC for approval prior to the removal.

5.6.6.2 Operational Phase Invasive Species Management

The following will be adhered to, to avoid the introduction of new invasive species to the Proposed Development Site, and the spread of existing invasive species offsite:

- Any material required on the site will be sourced from a stock that has been screened for the presence of any invasive species by a suitably qualified ecologist and where it is confirmed that none are present.
- All machinery (incl. HGVs bringing infill materials) will be thoroughly cleaned and disinfected prior to arrival on Site to prevent the introduction of new invasive species to the Site.
- Sufficient buffer zones will be maintained around the remaining invasive species stands (i.e., Buddleia), and all plant and HGV operation at the Site will take place outside of these buffer zones.
- All machinery (incl. HGVs bringing infill materials) will be thoroughly cleaned and disinfected before leaving the Site to prevent the spread of invasive species offsite.

5.6.7 Protection of Non-volant Mammals

The measures detailed in the preceding sections to reduce noise and dust impacts will also serve to minimise disturbance from same on the terrestrial non-volant mammals (e.g. Badger, Fox, Pine Marten, Hedgehog) utilising the Site. Additionally, the higher sward grassland areas could potentially support day-nesting hedgehogs during the summer. Therefore, higher sward grass areas will be inspected for any sleeping hedgehogs prior to infilling to avoid injury/death. Infilling should also take place in a consistent direction to prevent entrapment of protected fauna potentially present.

5.6.8 To reduce the potential for injury/mortality of commuting mammals, a speed limit of 10km/h along the access road will be implemented and strictly adhered to by all Site traffic (HGVs and staff entering and leaving the Site). Protection of Bats and Bat habitats

The measures detailed in the preceding sections to reduce noise and dust impacts will also serve to minimise disturbance from same on any locally occurring bats. Additionally, the Proposed Development could lead to indirect effects on bats by removal of their foraging and commuting habitats (i.e., wet grassland, ponds). No mitigation is required to address potential injury/death of bats arising from the Proposed Development, as no tree removal is proposed.

5.6.9 Protection of Birds

The measures detailed in the preceding sections to reduce noise and dust impacts will also serve to minimise disturbance from same on local bird populations.

Any clearance of vegetation (incl. wet grassland) or pond infilling will be carried out outside the main breeding season, i.e. 1st March to 31st August, in compliance with the Wildlife Act 2000. Should any vegetation removal be required during this period, the NPWS will be consulted, and instruction taken from them. Should nesting birds be discovered, the nest will be protected until any nesting birds have fledged and departed the site.

5.6.10 Protection of Fish & Amphibians

Prior to the commencement of infilling activities, a dedicated amphibian survey will be undertaken to ascertain presence/absence of Smooth Newt at the Site. The NPWS will be consulted on this.
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consulted regarding the confirmed frog breeding at the Site, and a derogation licence will be obtained prior to commencement of infilling activities. The NPWS advice on the approach for infilling the ponds and confirmed breeding areas with regard to protected species (i.e., Common Frog and potential Smooth Newt) will be fully adhered to.

No mitigation or compensation measures were identified to address the impacts from loss of habitat on fish and other aquatic fauna within the ponds destined for infill.

The mitigation measures outlined in section 5.6.1 and 5.6.2 above will serve to protect fish and other aquatic fauna (incl. aquatic lifeforms of invertebrates) in the retained ponds and waterlogged areas of the Site and within the adjacent Thomastown Stream.

5.6.11 Timing of vegetation clearance

The following table provides guidance for when vegetation clearance and infilling works of the ponds are permissible. Information sources include the British Hedgehog Preservation Society's *Hedgehogs and Development* and *The Wildlife (Amendment) Act, 2000*.

Table 5-12: Seasonal restrictions on vegetation removal. Red boxes indicate periods when clearance/works are not permissible.

Ecological Feature	January	February	March	April	May	June	July	August	September	October	November	December
Breeding Birds	Vegetation clearance permissible		<u>Nesting bird season</u> No clearance of vegetation or works to relevant structures permitted unless confirmed to be devoid of nesting birds by an ecologist						Vegetation clearance permissible			
Hibernating mammals (namely Hedgehog, excluding bats)	<u>Mammal hibernation season</u> No clearance of vegetation or works to relevant structures permitted unless confirmed to be devoid of hibernating mammals by an ecologist		Vegetation clearance permissible							<u>Mammal hibernation season</u> No clearance of vegetation or works to relevant structures permitted unless confirmed to be devoid of hibernating mammals by an ecologist		

The preferred period for vegetation clearance is within the months of September and October (Table 5-12). Vegetation will be removed in sections working in a consistent direction to prevent entrapment of protected fauna potentially present (e.g. Hedgehog).

5.7 Residual Impacts

Residual impacts are impacts that remain once mitigation has been implemented or impacts that cannot be mitigated. Table 5-13 provides a summary of the impact assessment for the identified Key Ecological Resources (KERs) and details the nature of the impacts identified, mitigation proposed and the classification of any residual impacts.

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Significant residual impacts remain relating to habitat loss, for which no mitigation was identified. The provision of agricultural pastureland in place of the current grassland habitats at the Site will permanently reduce the biodiversity value of the Site.

However, provided all mitigation measures identified in Section 5.6 are implemented in full and remain effective throughout the lifetime of the Development, the retained habitats will not be subject to any significant negative residual impacts from the Proposed Development.



Table 5-13: Summary of potential impacts on KER(s), mitigation proposed and residual impacts

Key Ecological Receptor	Level of Significance	Potential Impact	Impact Without Mitigation				Proposed Mitigation	Residual Impact
			Quality	Magnitude / Extent	Duration	Significance		
GS4 - Wet grassland	Local Importance (higher value)	Loss of approx. 2.3 ha of habitat due to infill.	Negative	Local	Permanent	Significant	None proposed.	Negative, permanent, significant at a local level.
		Spread of JK over retained habitat areas and offsite.	Negative	Local to County	Long-term	Significant	Pre-construction removal of JK and JK Management Plan (section 5.6.6.1)	Imperceptible.
		Introduction of new invasive species with infill materials.	Negative	Local	Long-term	Slight	Operational Invasive Species Management Plan (section 5.6.6.2)	Imperceptible.
FL8 - Other artificial lakes and ponds; Waterlogged areas	Local importance (higher value)	Loss of approx. 0.2 ha of habitat due to infill.	Negative	Local	Permanent	Significant	None proposed	Negative, permanent, significant at a local level.
		Deterioration of water quality within retained areas.	Negative	Local	Short-term	Significant	Surface and ground water protection measures (sections 5.6.1 & 5.6.2)	Imperceptible
WL1 - Hedgerow	Local Importance (higher value)	Accidental damage to Root Protection Area (RPA) during infill activities.	Negative	Local	Long-term	Slight	Tree and hedgerow protection measures in place during infill activities (section 5.6.5)	Imperceptible

Key Ecological Receptor	Level of Significance	Potential Impact	Impact Without Mitigation				Proposed Mitigation	Residual Impact
			Quality	Magnitude / Extent	Duration	Significance		
FW4 – Drainage Ditch; FW2 – Depositing / lowland river	Local importance (higher value)	Surface water run off during infill activities.	Negative	Local	Short-term	Significant	Surface and ground water protection measures (sections 5.6.1 & 5.6.2)	Imperceptible.
Mammals (Badger, Pine Marten, Fox, Hedgehog)	Local Importance (Higher Value)	Loss of commuting and foraging habitat.	Negative	Local	Permanent	Moderate	No mitigation identified.	Negative, permanent, moderate at a local level.
		Disturbance due to noise and dust during infilling activity.	Negative	Local	Short-term	Moderate	Incorporation of protective mitigation measures to reduce impact of infilling activities (sections 5.6.7 & 5.6.11)	Imperceptible.
		Possible injury/mortality due to construction site hazards (site traffic, vegetation clearance).						
Bat assemblage	Local Importance (Higher Value)	Loss and/or damage to sections of foraging and commuting habitat.	Negative	Local	Permanent	Moderate	No mitigation identified.	Negative, permanent, moderate at a local level.
		Disturbance due to noise, dust and increased human activity at the Site.	Negative	Local	Short-term	Slight	Incorporation of noise and dust mitigation measures to reduce impact of infilling activities (sections 5.6.3 & 5.6.4)	Imperceptible.
Bird assemblage	Local Importance (Higher Value)	Disturbance due to noise and increased human activity at the Site.	Negative	Local	Short-term	Slight	Incorporation of noise and dust mitigation measures to reduce	Imperceptible.

Key Ecological Receptor	Level of Significance	Potential Impact	Impact Without Mitigation				Proposed Mitigation	Residual Impact
			Quality	Magnitude / Extent	Duration	Significance		
RECEIVED 6 DEC 2022 Kildare County Council Planning Department		Direct harm and destruction of nests should vegetation clearance / pond infilling be carried out within the breeding bird season.	Negative	Local	Short-term	Significant	impact of infilling activities (sections 5.6.3 & 5.6.4)	Imperceptible.
		Loss of nesting habitat (particularly waterfowl).	Negative	Local	Permanent	Moderate	Any clearance of vegetation will be carried out outside the main breeding season (section 5.6.1.1) No mitigation identified.	Negative, permanent, moderate at a local level.
Fish & Amphibians	Local Importance (Higher Value)	Injury/mortality during infilling of ponds.	Negative	Local	Short-term	Significant	NPWS to be consulted prior to commencing infilling.	Negative, short-term, slight
		Loss of habitat from pond infilling.	Negative	Local	Permanent	Moderate	No mitigation identified.	Negative, permanent, Moderate at a local level.
		Potential for adverse effects resulting from water quality deterioration during the infilling activities.	Negative	Local	Short-term	Moderate	Protection of surface waters during the construction phase	Imperceptible.

5.8 Monitoring

5.8.1 Maintenance of Silt Fence and 10m buffer from watercourses

For the duration of the infilling activities at the Proposed Development Site, it is proposed to regularly assess the integrity of the silt fencing installed along the watercourses to the north and east of the Site, to ensure their continued efficacy, with repairs carried out as necessary.

The adherence to the 10m exclusion zone along these waterbodies should be regularly inspected to ensure compliance is continuous for the duration of the Proposed Development.

5.8.2 Maintenance of Invasive Species buffer zones and exclusion fencing

For the duration of the infilling activities at the Proposed Development Site, it is proposed to regularly assess the integrity of the fencing installed at the entrance gate, and surrounding any retained invasive species at the Site (e.g., Buddleia), to ensure their continued efficacy, with repairs carried out as necessary.

The adherence to the 10m exclusion zone along the retained stands of Butterfly Bush should be regularly inspected to ensure compliance is continuous for the duration of the Proposed Development.

5.8.3 Amphibians

Monitoring of continued amphibian breeding at the Site is recommended to ensure that the infilling activities do not cause significant impacts to local breeding populations of protected species (i.e., Common Frog and potential Smooth Newt). Continued monitoring approach will take into account the outcomes of consultation with the NPWS (section 5.6.10).

5.9 Interactions

This Chapter pertaining to the ecological and biodiversity aspects of the Proposed Development, has the potential to interact with aspects of the following Chapters of this EIA:

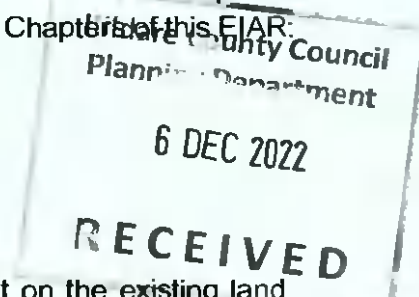
- Chapter 6: Land, Soil & Geology
- Chapter 7: Hydrology
- Chapter 9: Noise and Vibrations

5.9.1 Land & Soil

An assessment of the potential impact of the Proposed Development on the existing land, soils and geological environment; with emphasis on the importation of soil and stone for recovery and the potential accidental release of contaminated materials to ground during both during the Construction and Operational Phases of the Proposed Development, is described in Chapter 6- 'Land, Soil and Geology' of this report. Measures for the mitigation of these impacts are set out in Chapter 6.

5.9.2 Hydrology

An assessment of the potential impact of the Proposed Development on the hydrological and hydrogeological environment is described in Chapter 7- 'Hydrology' of this report. Procedures for dealing with silt laden runoff at the Site; potential spills/leakages of fuels/contaminants; and



the best practise construction measures to be in place with regard to waterbodies located at the Site, are outlined in this Chapter.

5.9.3 Noise and Vibrations

An assessment of the potential impact of the Proposed Development in the form of excess noise and vibrations associated with the Proposed Works are laid out in Chapter 9- 'Noise and Vibrations'. These impacts are considered to be relevant to the ecological sensitivities associated with the Site of the Proposed Development discussed in this Chapter; and mitigation measures addressing these potential impacts are both referenced in this Chapter and described in full in Chapter 9.

5.10 Difficulties Encountered When Compiling

No difficulties were encountered when compiling this EIAR Biodiversity Chapter.

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6 LAND, SOILS AND GEOLOGY

6.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) provides a description of the land, soils and geology within and immediately surrounding the Proposed Development Site, an assessment of the potential impacts of the Proposed Development on land, soils and geology and sets out any required mitigation measures where appropriate.

The principal objectives of this Chapter are to identify:

- Land, soils, and geological characteristics at the Proposed Development Site;
- Potential impacts that the Proposed Development may have on land, soils and geology including “worst case” scenario assessment;
- Potential constraints that the environmental attributes may place on the Proposed Development;
- Required mitigation measures which may be necessary to minimise any adverse impacts related to the Proposed Development; and
- Evaluate the significance of any residual impacts.

6.1.1 Quality Assurance and Competence

This Chapter of the EIAR was written by Gareth Carroll BAI, Senior Environmental Consultant with Enviroguide Consulting with 10 years' experience of environmental assessment of brownfield and greenfield sites. The Chapter was reviewed by Claire Clifford BSc., MSc., PGeo., EurGeol who is Technical Director of the Contaminated Land and Hydrogeology Division of Enviroguide Consulting and is a Professional Geologist with the Institute of Geologists of Ireland and has extensive experience in preparing environmental assessments for a range of project types and geological and hydrogeological site settings.

6.1.2 Description of the Proposed Development

A fill plan has been drawn up for the importation of 68,970m³ of soil to fill Area 1, and 16,670m³ to fill Area 2, equating to a total of 85,640m³ (ca. 128,460 tonnes) of soil and sub-soil. A volume to weight conversion factor of 1.50 is taken from the Waste Management (Land-fill Levy) Regulations, 2008, SI 199 of 2008. The surface layer will comprise of 300mm of topsoil which will be graded to an even surface finish. It is proposed even out the levels of the site in order to allow for the safety of grazing animals. Once the importation is complete the Applicant will seed the land in line with Teagasc guidelines and return it to agricultural use. The proposed new levels and fill plan are detailed in Drawings P-01 to P-07 prepared by Enviroguide Consulting, 2022 (refer to Appendix A).

Once planning permission is obtained, it is intended to apply to Kildare County Council for a Waste Facility Permit. Material will be accepted in accordance with the conditions of the permit. As part of the Environmental Management Plan a register of incoming materials for the site will be maintained at all times. The only List of Waste (LoW) code accepted on site will be 17 05 04 - Soil and Stones other than those mentioned in 17 05 03.

It is proposed to accept material onto the site from 08.00 until 18.00 Monday to Friday and 08.00 to 14.00 on Saturday. It is not proposed to operate on Sundays or Bank Holidays.

Temporary welfare facilities will be located in the northeast of the site as per Figure 2-2, Site Layout Plan and harvested rainwater will be used in the wheel wash or for dust suppression.

Soil will be imported using Heavy Goods Vehicles from contractors authorised to transport waste, coming from a known source which has previously been inspected. In the interest of maintaining quality of incoming material the number of contractors delivering material to the site will be limited to a single contractor. Prior to deposition the consignment note for each load will be inspected by the site supervisor to ensure that the material is acceptable, and each load will be evaluated in accordance with the site's waste acceptance procedure.

The site has the potential to import inert soil and stones for land improvement for agriculture uses and will also improve drainage. As the site elevations decrease from across the site, with the most acute declines located to the north, it is proposed to raise the northern, central and southern sections of the site to come in line with the boundary elevations, refer to Drawings P-04 and P-05 for elevations. The proposed plant will consist of a tracked bulldozer for placing the soil and compressing it to a level that will permit good drainage. An excavator may be brought on to site from time to time to construct internal haul roads.

Thus, the focus of the proposed filling is concentrated in the central and eastern areas of the site. Cut and fill cross sections for the Proposed Development are attached as part of this planning application (refer to drawings included as Appendix A). Details of existing ground level, proposed change in elevation and final fill level are detailed in Drawings P-01 to P-07. It is proposed to carry this work out over a 5-year period, subject to the availability of appropriate soil, to allow the soil to settle naturally with minimal compaction. The soil and subsoils will be mixed, to minimise compaction and improve drainage.

Filling operations will be confined to a selected area of the site at any one time with each area being restored in a timely manner from commencement of the next phase.

A 10-meter buffer and silt fence will be maintained along the eastern boundaries of the site where no soil importation will take place to protect surface waters and to ensure that there are no offsite nuisances created by the site.

The re-profiling of the surface will be carried out to allow for the planting of native grassland as recommended by Teagasc. The re-profiling works will be supervised by a qualified landscape architect to ensure that the filling is carried out in a manner that will derive maximum benefit from this.

The Proposed Development Site layout is presented in Figure 6-1.





6.2 Study Methodology

6.2.1 Regulations and Guidance

The methodology adopted for the assessment takes cognisance of the relevant guidelines in particular the following:

- Environmental Protection Agency (EPA), May 2022. Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022);
- Institute of Geologists of Ireland Guidelines, 2002. Geology in Environmental Impact Statements, A Guide (IGI, 2002);
- Institute of Geologists of Ireland Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013);
- National Roads Authority, 2009. Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009); and
- OPR, June 2021. OPR Practice Note PN02. Environmental Impact Assessment Screening (OPR, 2021);

6.2.2 Phased Approach

A phased approach was adopted for this EIAR in accordance with Environmental Protection Agency (EPA) and Institute of Geologists of Ireland (IGI) guidelines as set out above and is described in the following sections.

Element 1: An Initial Assessment and Impact Determination stage was carried out by Enviroguide Consulting to establish the project location, type and scale of the Proposed Development, the baseline conditions, and the type of land, soil, geological environment, to establish the activities associated with the Proposed Development and to undertake an initial assessment and impact determination.

This stage of the assessment included a desk top study that comprised a review of published environmental information for the Proposed Development Site and information provided by the Applicant. The study area, for the purposes of assessing the baseline conditions for the Land, Soil and Geology Chapter of the EIAR, extends beyond the Proposed Development Site boundaries and includes potential receptors within a 2.0km radius of the Proposed Development Site (IGI, 2013).

This stage of the assessment was completed by Enviroguide Consulting and included the review of the following sources of information:

- Environmental Protection Agency (EPA) webmapping (EPA, 2022);
- Environmental Protection Agency (EPA) Guidance on Waste Acceptance Criteria at Authorised Soil Recovery Facilities (EPA, 2020);
- Geological Survey Ireland (GSI) Datasets Public Viewer and Groundwater webmapping (GSI, 2022);
- Ordnance Survey Ireland (OSI) webmapping (OSI, 2022);
- National Parks and Wildlife Services (NPWS) webmapping (NPWS, 2022);
- Teagasc webmapping (Teagasc, 2022); and
- Information provided by the Applicant pertaining to the design proposals for the Proposed Development.

This stage of the assessment also included walkover surveys of the Site undertaken by Enviroguide Consulting on the 4th May 2022, the 19th May 2022 and the 31st August 2022 to establish the environmental Site setting and baseline conditions at the Site relevant to receiving land, soil and geology at the Site. The survey included the inspection and geological logging of exposed geological strata along quarry faces within the existing quarried areas of the Site.

Element 2: Based on a review of the information compiled and assessed in Element 1, including walkover surveys, it was determined that a direct or indirect site investigations and studies stage was not required as there was sufficient baseline information available regarding the Proposed Development Site to inform the impact assessment of the Proposed Development on the receiving land, soil, and geology environment.

Element 3: Evaluation of Mitigation Measures, Residual Impacts and Final Impact Assessment were based on the outcome of the information gathered in Element 1 of the assessment. Mitigation measures to address all identified adverse impacts that were identified in Element 1 of the assessment were considered in relation to the Construction Phase and the Operational Phase of the Proposed Development. These mitigation measures were then considered in the impact assessment to identify any residual impacts.

Element 4: Completion of the Land, Soils and Geology Chapter of the EIAR which includes all the associated figures and documents.

6.2.3 Description of Importance of the Receiving Environment

The National Roads Authority (NRA) criteria for estimation of the importance of geological features at the Proposed Development Site during the Environmental Impact Assessment (EIA) stage, as documented by IGI (IGI, 2013) are summarised in Table 6-1.



Table 6-1: Criteria for Rating Site Importance of Geological Features

Importance	Criteria	Typical Example
Very High	Attribute has a high quality, significance or value on a regional or national scale. Degree or extent of soil contamination is significant on a national or regional scale. Volume of peat and/or soft organic soil underlying route is significant on a national or regional scale.	Geological feature rare on a regional or national scale (NHA). Large existing quarry or pit. Proven economically extractable mineral resource.
High	Attribute has a high quality, significance or value on a local scale. Degree or extent of soil contamination is significant on a local scale. Volume of peat and/or soft organic soil underlying route is significant on a local scale.	Contaminated soil on-Site with previous heavy industrial usage. Large recent landfill Site for mixed wastes. Geological feature of high value on a local scale (County Geological Site). Well drained and/or high fertility soils. Moderately sized existing quarry or pit. Marginally economic extractable mineral resource.
Medium	Attribute has a medium quality, significance or value on a local scale. Degree or extent of soil contamination is moderate on a local scale. Volume of peat and/or soft organic soil underlying route is moderate on a local scale.	Contaminated soil on-Site with previous light industrial usage. Small recent landfill Site for mixed wastes. Moderately drained and/or moderate fertility soils. Small existing quarry or pit. Sub-economic extractable mineral resource.
Low	Attribute has a low quality, significance or value on a local scale. Degree or extent of soil contamination is minor on a local scale. Volume of peat and/or soft organic soil underlying route is small on a local scale.	Large historical and/or recent Site for construction and demolition wastes. Small historical and/or recent landfill Site for construction and demolition wastes. Poorly drained and/or low fertility soils. Uneconomically extractable mineral resource.

6.2.4 Description and Assessment of Potential Impact

Impacts will vary in quality from negative, to neutral or positive. The effects of impacts will vary in significance on the receiving environment. Effects will also vary in duration. The terminology and methodology used for assessing the 'impact' significance and the corresponding 'effect' throughout this Chapter is described in Table 6-2.

Table 6-2: Assessment of Potential Impacts Terminology and Methodology

Quality of Effects / Impacts	Definition
Negative	A change which reduces the quality of the environment.
Neutral	No effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error.
Positive	A change that improves the quality of the environment.
Significance of Effects / Impacts	Definition
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.
Duration of Effects / Impacts	Definition
Momentary	Effects lasting from seconds to minutes.
Brief	Effects lasting less than a day.
Temporary	Effects lasting one year or less.
Short-term	Effects lasting one to seven years.
Medium-term	Effects lasting seven to fifteen years.
Long-term	Effects lasting fifteen to sixty years.
Permanent	Effects lasting over sixty years.
Reversible	Effects that can be undone, for example through remediation or restoration.

6.3 The Existing and Receiving Environment (Baseline Situation)

6.3.1 Site Location and Description

The Site of the Proposed Development has a total area of 7.243 hectares (Ha) and is located in Thomastown, Johnstown Bridge, Co. Kildare. The Site is accessed off the L5014 local road which connects to the R402 regional road located approximately 600 metres to the east of the Site. The village of Johnstown Bridge is located approximately 1.81km to the east of the Site and Kilshanroe village is located approximately 1.9km to the southwest.

The Site comprises a historic sand and gravel quarry which includes an extraction area in the north and west/southwest portion of the Site and an unworked greenfield area in the central and southeast portion of the Site. There is an open waterbody and two smaller ponds located in the central portion of the Site.

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The Proposed Development Site is bounded to the north, south and west by agricultural land and the Thomastown Stream (River Waterbody Code: IE_EA_07B020200) adjoins the eastern boundary of the Site and the internal access route adjoins the unnamed road to the south.

The Site is located within a rural setting with the surrounding land uses comprising predominantly agricultural land with one-off residential properties and a number of one-off commercial type facilities.

The Site location is presented in Figure 6-2.

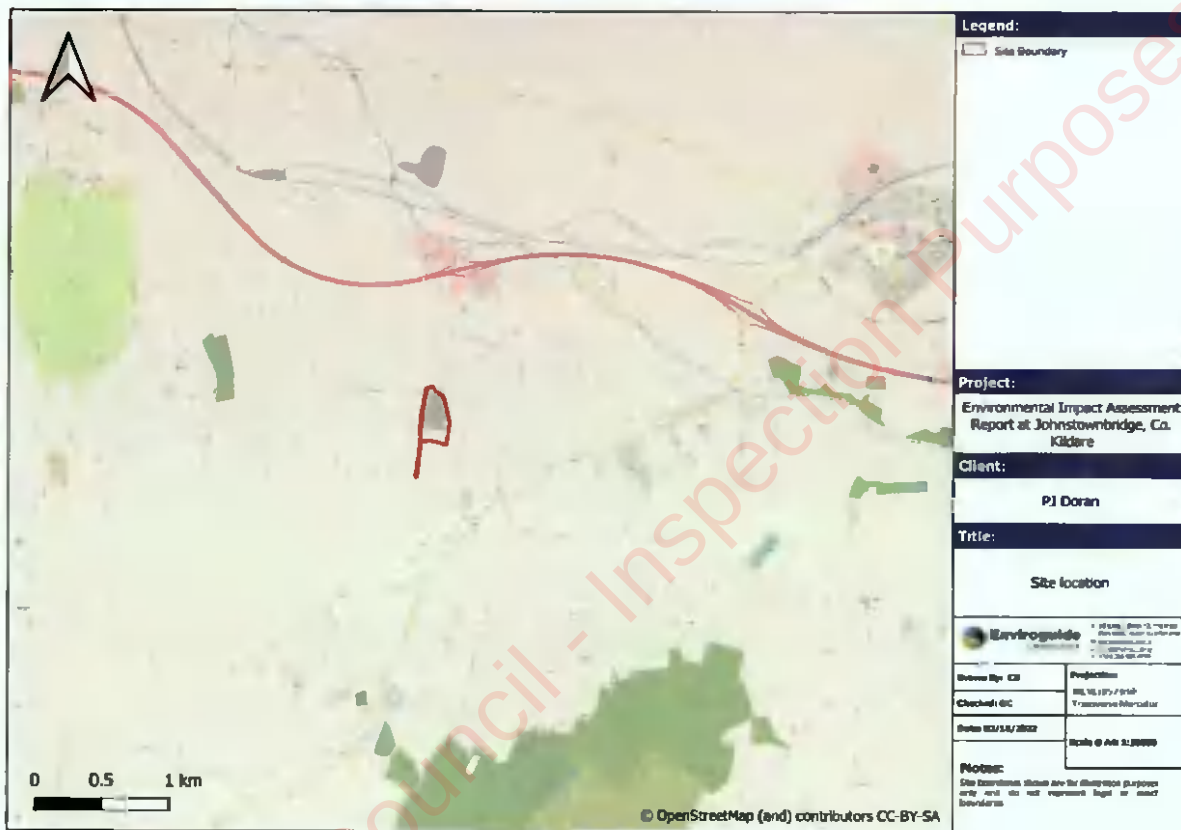


Figure 6-2: Site Location

6.3.2 Historical Land Use

Historical mapping and aerial photography available from the Ordnance Survey of Ireland webSite (OSI, 2022) and Google Earth (Google Earth, 2022) were reviewed and key observations on-Site and off-Site are summarised in Table 6-3.



Table 6-3: Historical Land Use

Date	Information Source	Site Description
1837-1842	OSI map 6 inch	On-Site: The Site is shown as open fields divided by field boundaries. The access road to the Site from the unnamed local road to the south is identified. Two (2No.) buildings are identified at the entrance to the Site. Off-Site: The surrounding lands are predominantly open fields divided by field boundaries with a number of one-off buildings/structures. Two (2No.) unnamed streams are identified approximately 0.28km north and 0.41km east of the Site. These streams are identified to converge before discharging to the Blackwater (Longwood) River approximately 1.13km north of the Site.
1888-1913	OSI map 25 inch	On-Site: An unnamed stream edjoins the eastern boundary of the Site. This stream flows north before converging with the unnamed stream previously identified to the north of the Site. Two (2No.) additional buildings including a 'pump house' are identified at the entrance to the Site. Off-Site: The source of the unnamed stream to the north of the Site is identified as a 'spring'. The unnamed stream previously identified to the east of the Site is identified as the 'Togher River'.
1830-1930	OSI Cassini map 6 inch	On-Site: No significant changes. Off-Site: No significant changes.
1995	OSI Arial photography	On-Site: The access road to the Site from the unnamed local road to the south extends along the western boundary of the Site. Off-Site: No significant changes.
1999-2003	OSI Arial photography	On-Site: No significant changes. Off-Site: A building structure is identified in the field adjoining the western boundary of the Site.
2004-2006	OSI Arial photography	On-Site: A small-scale quarrying operation is identified on the lands in the western, southern and central portions of the Site. The building structures at the entrance to the Site are no longer identified. Off-Site: No significant changes.
2013-2018	OSI Arial photography	On-Site: Quarrying operations appear to have ceased and an open waterbody is identified in the central portion of the Site. Off-Site: No significant changes.
2022	Google Maps photography	On-Site: No significant changes Off-Site: No significant changes

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6.3.3 Site Topography

The topography surrounding the Site comprises gently rolling farmland with elevations ranging from approximately 80meters above Ordinance Datum (maOD) to the south of the Site and approximately 70maOD to the north of the Site near the M4 motorway.

The topographical survey of the Site indicated that the topography ranges from a high point 79mOD in the unworked area of the quarry in the central portion of the Site to 74mOD at the quarry floor in the north, west and south of the Site. There is a steep slope between the quarry pit floor at approximately 74mOD and the western boundary of the Proposed Development Site at 77mOD.

It is noted that there was no subsidence observed at the Site and on lands immediately adjoining the existing quarry during the Site walkover surveys undertaken by Enviroguide Consulting on the 4th May 2022, the 19th May 2022 and the 31st August 2022.

The topographical survey drawings and sections for the Proposed Development Site are included in Drawings No. P-02 to P-04 (Enviroguide Consulting 2022).

6.3.4 Soil and Subsoil (Quaternary Soils)

The soil beneath the Site has been mapped by Teagasc (Teagasc, 2022) as moderately drained fine loamy drift with limestones of the Elton (1000x) soil series (Teagasc, 2022).

A figure depicting the soils mapped beneath the Site is presented in Figure 6-3.

The subsoils or quaternary soils beneath the Site are mapped by the GSI (GSI, 2022) as 'gravels derived from limestones (GLs)' in the central and northern portions of the Site, 'till derived from limestones (TLs)' beneath the central and southwest portions of the Site. An area in the southeast corner of the Site is mapped as 'lacustrine sediments' (GSI, 2022).

The quaternary geology at the Proposed Development Site is presented in Figure 6-4.





Figure 6-3: Soils



Figure 6-4: Quaternary Soils

During the Site walkover surveys undertaken by Enviroguide Consulting in 2022, it was identified that the remaining soil and subsoils outside of the quarried area of the Site were consistent with the GSI mapped soil and subsoil. The soil and subsoil logged at the exposed quarry face along the western boundary of the Site comprised of brown slightly gravelly sandy silt of varying thickness (between 0.2m and 0.8m) overlying grey SAND and GRAVEL with some cobbles of limestone (refer Figure 6-5). The soils logged at the exposed quarry face in the central portion of the Site comprised of brown slightly gravelly Clay from ground level to 1.6m (refer to Figure 6-5).



Figure 6-5: Exposed Soils at the Quarry Face along the Western Boundary of the Site

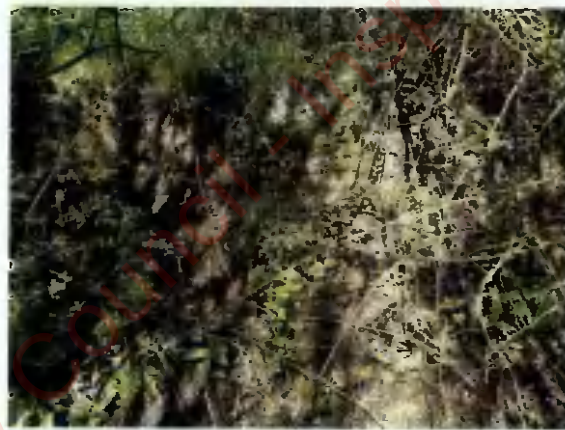


Figure 6-6: Exposed Soils at the Quarry Face in the Central Portion of the Site

Stockpiles of residual soil from quarry operations were logged during the Site walkover surveys as SAND and GRAVEL with occasional cobbles were also (refer to Figure 6-7).





Figure 6-7: Stockpiled Residual Soil at the Site

6.3.5 Bedrock Geology

Based on the GSI database (GSI, 2022) the bedrock beneath the Proposed Development Site is mapped as the Lucan Formation (New Code: CDLUCN) comprising dark-grey to black, fine-grained, occasionally cherty, micritic limestones that weather paler, usually to pale grey. There are rare dark coarser grained calcarenitic limestones, sometimes graded, and interbedded dark-grey calcar.

There is one (1No.) bedrock outcrop identified by the GSI (GSI, 2022) within a 2km radius of the Site. Bedrock was not identified at the Site during the walkover surveys completed by Enviroguide Consulting on the 4th May 2022.

The Bedrock Geology is presented in Figure 6-8.

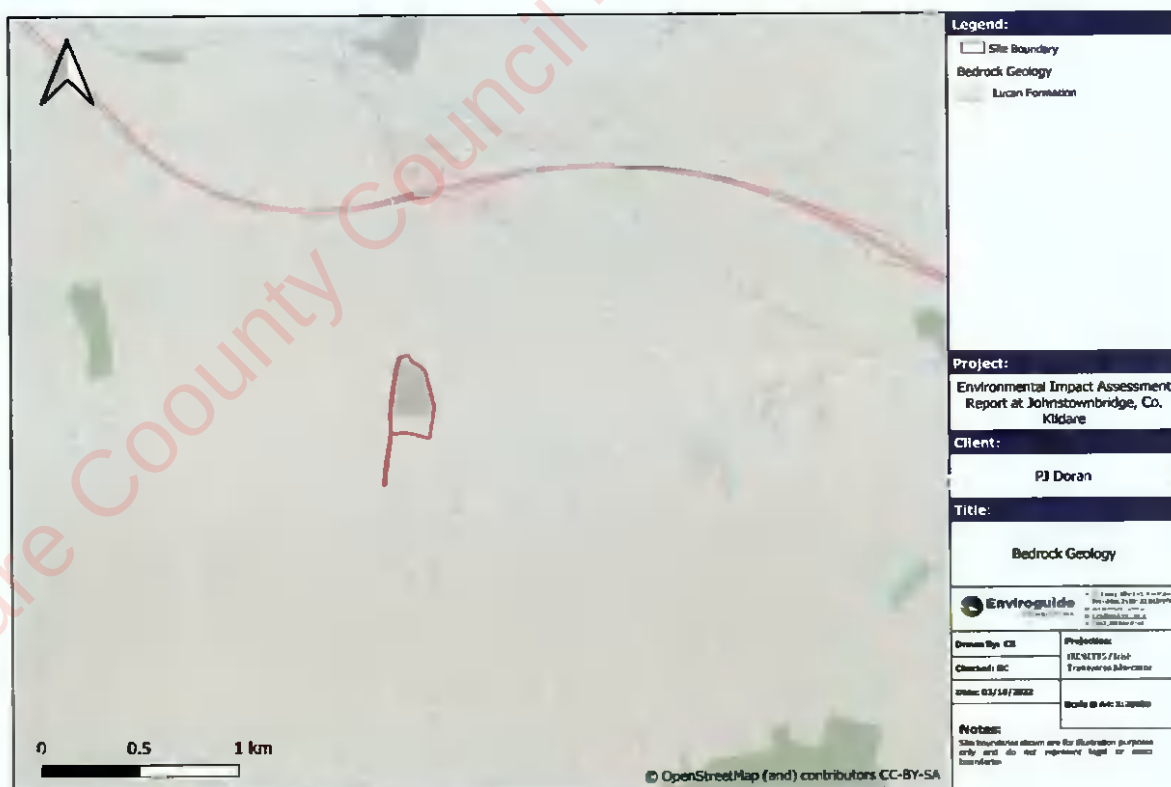


Figure 6-8: Bedrock Geology

6.3.6 Geochemical Domain

The GSI undertook a geochemical domain-setting exercise which divided the country into zones or domains based on similar geochemical signature by subdividing the National Soil Database using mapped subsoil and bedrock type (GSI, 2020). The GSI in partnership with the EPA developed Geochemically Appropriate Levels (GALs) for each of the seven geochemical domains identified by the GSI to account for the natural variation in soil metal contents associated with soil parent materials and rock types in Ireland. The GALs were defined to support the EPA's 'Guidance on Waste Acceptance Criteria at Authorised Soil Recovery Facilities' (EPA, 2020).

The Site is located within Geochemical Domain 2 which is characterised as 'carboniferous limestones, shales and related rocks' (EPA, 2020, GSI, 2020). A summary of the *Geochemically Appropriate Levels / maximum Concentrations for Domain 2* (EPA, 2020) is presented in Table 6-4.

Table 6-4: Geochemically Appropriate Levels /Maximum Concentrations

Element	Units	Domain 2
Arsenic	mg/kg	24.9
Cadmium	mg/kg	3.28
Chromium	mg/kg	50.3
Copper	mg/kg	63.5
Mercury	mg/kg	0.36
Nickel	mg/kg	61.9
Lead	mg/kg	86.1
Zinc	mg/kg	197.0
BTEX	mg/kg	0.05
PAH 17 total	mg/kg	1
PCB 7 total	mg/kg	0.05
Mineral Oil	mg/kg	50
TOC	%	3%
Asbestos	-	Absent

6.3.7 Geological Heritage

A review of the GSI Geological Heritage Database (GSI, 2022) indicated that there are no geological heritage Sites located within a 2km radius of the Site.

The closest geological heritage Sites are the Kilbrook Springs (KE015) comprising a warm spring within disused gravel pits, and Ballykane Hill (KE010), comprising a disused quarry on Ballykane Hill located approximately 7.32km northeast and 8.46km west of the Site respectively.

6.3.8 Economic Geology

The GSI database (GSI, 2022) has identified the area as having a 'high' to 'very high' potential for granular aggregate and a "moderate" potential for crushed rock aggregate. It is noted that there are no active quarries located within 2.0km of the Site.

6.3.9 Radon

The Site is mapped by the EPA (EPA, 2022) to be an area where between 10% of the homes are likely to have high radon levels. A High Radon Area is an area where it is predicted that more than 10% of homes will exceed the national reference level of 200 Becquerel per cubic metre (Bq/m³). Therefore, the Site is considered to be within a High Radon Area. It is noted that a high radon level can be found in any area, in any part of the country, but are more likely to be located in High Radon Areas.

6.3.10 Geohazards

The GSI (GSI, 2022) records for karst features indicate that there are no karst features within 2km of the Proposed Development Site.

The Proposed Development Site and surrounding lands are located within an area with a 'low' landslide susceptibility classification (GSI, 2022). There are no recorded landslides at the Proposed Development Site recorded on the GSI database (GSI, 2022) and the closest, which was associated with a historic breach of the northern bank of the Grand Canal approximately 13.4km southwest of the Site. There was no evidence of subsidence identified during the walkover surveys of the Site on 4th May 2022, the 19th May 2022 and the 31st August 2022.

In Ireland, seismic activity is recorded by the Irish National Seismic Network operated by Dublin Institute for Advanced Studies (DIAS) which has been recording seismic events in Ireland since 1978, the database was consulted as part of this assessment. There are six permanent broadband seismic recording stations in Ireland operated by DIAS. Records since 2010 (DIAS, 2022) show that the majority of recorded seismic events were associated with quarry blasts and no recent events have been recorded within 2km of the Proposed Development Site or the Greater Dublin Area.

6.3.11 Summary of the Baseline Environment

The surrounding area has been identified by the GSI as having 'high' to 'very high' potential for granular aggregate and a 'moderate' potential for crushed rock (GSI, 2022). However, much of the Site has been previously extracted for sand and gravel supply. As it currently stands the Site has not been restored and the land is of extremely low-grade agricultural land, mainly bare soil or recolonised bare soil. Furthermore, further economic extraction of crushed rock aggregate at the Proposed Development Site will not be feasible. There are no geological heritage sites at or within 2km of the Site.

Therefore, in accordance with the criteria in Table 6-1 the soil and geology underlying the Proposed Development Site would be rated as an attribute of 'medium' to 'low' geological importance.

6.4 Characteristics of the Proposed Development

6.4.1 Construction Phase

The Construction Phase for the Proposed Development will only comprise the following enabling works:

- Limited excavation and regrading of soil for the demarcation of the inspection and quarantine area, and

- installation of the Site office and welfare facilities(portacabins), the weighbridge, and the wheel wash.

6.4.2 Operational Phase

The Proposed Development comprises the importation of material to in-fill and re-contour the Site. The Applicant proposes, subject to the grant of permission, to import clean soil and sub-soil from greenfield development Sites to restore 3.689Ha of the total Site.

The proposed plant will consist of a tracked bulldozer for placing the soil and compressing it to a level that will permit good drainage. A mechanical excavator may be brought on to Site from time to time to construct internal tracks/haul routes.

A fill plan has been prepared for the importation of a maximum of approximately 85,640m³ (128,460 tonnes) of greenfield soil and subsoil. Importation of material to in-fill and re-contour the Site will be undertaken over a period of approximately 5 years, subject to the availability of appropriate soil.

It is proposed to raise the level of the Site by approximately 3.0m to come in line with the boundary elevations (refer to Figure 6-6). Filling operations will be confined to a selected area of the Site at any one time with each area being restored in a timely manner from commencement of the next phase. Details of existing ground level and proposed levels are detailed in the cross sections and fill plan for the Proposed Development (Drawings No. P-02 to P-04; Enviroguide Consulting, 2022).

Once the backfilling works are complete, the re-profiling of the surface will be carried out to allow for the planting of native grassland and supervised by a qualified landscape architect to ensure that the filling is carried out in a manner that will derive maximum benefit from this. The surface layer will comprise of 300mm of topsoil which will be graded to an even surface finish.





Enviroguide ADDRESS: 50 Carrigrohilly Road, The Plains, Carrigrohilly, Dublin 15, Ireland	EMAIL: info@enviroguide.ie PHONE: +353 (0)1 904 4730 WEBSITE: www.enviroguide.ie	Johnstown Bridge DRAWING TITLE: Proposed Design Levels DEPARTMENT: DRAWING STATUS: Engineering Planning	CLIENT: J Ryan LOCATION: Johnstown Bridge, County Kildare	DRAWN BY: SB CHECKED BY: SB DATE: 18/08/2022 SCALE: 1:2,000
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Figure 6-9: Proposed Site Layout and Fill Plan
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6.5 Potential Impact of the Proposed Development

The procedure for determination of potential impacts on the receiving land, soils and geological environment is to identify potential receptors within the Site boundary and surrounding environment and use the information gathered during the desk study and Site walkover to assess the degree to which these receptors will be impacted upon. Impacts are described in terms of quality, significance, duration and type as detailed in Table 6-2.

6.5.1 Construction Phase

6.5.1.1 Direct

This phase of the Proposed Development will consist of site preparation activities required to enable the Operational Phase of the Proposed Development.

The wheel wash that will be installed at the site and will be a prefabricated self-contained unit with water recycling.

The Proposed Development will not involve any excavation of bedrock. Site preparatory works will include some minor regrading of soil will be required for the installation of the prefabricated wheel wash. These soils will be retained on site. A temporary welfare unit will be in place for the construction phase which will be self-contained and emptied by vacuum tanker as required.

There will be no discharge to ground during the construction phase and therefore, there will be no impact to land, soil and geology associated with these activities.

The weighbridge, and wheel wash facilities that will be installed at the Site and will also be prefabricated self-contained units. Water supply for the wheel wash will be via rainwater harvesting and it will be emptied of sediment by vac-tanker as part of a maintenance contract by a suitably licensed waste contractor. Therefore, the Site preparation works for the Proposed Development will have a 'negative', 'imperceptible' and 'permanent' impact on the receiving soils which will remain on site for use in the restoration of the quarry.

There will be no storage or handling of deleterious materials such as lubricants, oils etc. and any refuelling will be controlled to minimise the potential for release to ground. There may also be the requirement for use of portable generators or similar fuel containing equipment during the construction phase of the Proposed Development, which will be placed on suitable drip trays. In the absence of standard and appropriate construction management and mitigation measures, if the accidental release of hazardous material including fuels and oils being used onsite, through the failure of secondary containment or a materials handling accident, were to occur over open ground then these materials could be released to ground. In the event of such scenarios, it is considered that this could result in 'negative', 'significant' and 'medium-term' impact on the land soil and geology depending on the nature of the incident. Appropriate controls will be in place to prevent this unlikely scenario.

Overall, it is considered that there will be no significant impact on the receiving land, soils and geology associated with the Construction Phase of the Proposed Development.

6.5.1.2 Indirect

There will be no indirect impacts associated with the Construction Phase of the Proposed Development.

6.5.1.3 Secondary

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There will be no secondary impacts associated with the Construction Phase of the Proposed Development.

6.5.2 Operational Phase

6.5.2.1 Direct

There will be a land take of 3.689Ha for the Proposed Development. The Site is currently a disused quarry, that will be restored with geochemically appropriate soils to restore the land for agricultural use similar to the surrounding lands. Therefore, the impacts on land will result in a 'positive', 'moderate' and 'permanent' impact on land associated with the Operational Phase.

Any requirement to strip topsoil will be undertaken on an as needed phased basis prior to placement of infilled geochemically appropriate soil to prevent any long duration exposure of soils and the topsoil will be appropriately stockpiled and stored onsite for re-use during the final restoration of the Site. Therefore, any impact on soils will be 'negative', 'imperceptible' and 'short-term'.

The proposal is to accept geochemically appropriate soil and subsoil from greenfield development Site at the Proposed Development for recovery, which will include imported clean, inert, greenfield soil and stone. In the unlikely event of the importation of contaminated materials are inadvertently infilled on the Site there would be a 'negative', 'moderate' and 'medium term' impact on the receiving environment.

There will be no storage or handling of deleterious materials such as lubricants, oils etc. and any refuelling will be controlled to minimise the potential for release to ground. In the event of an unlikely scenario, if the accidental release of hazardous material (i.e., fuels and oils being used onsite), through the failure of secondary containment or a materials handling accident, were to occur over open ground there would be a 'negative', 'significant' and 'medium-term' impact on the receiving geological environment depending on the nature of the incident.

Earthquakes are not likely to occur in the vicinity of the Proposed Development Site at a sufficient intensity to pose a risk for the Proposed Development. The GSI database indicates that the Proposed Development Site is located within an area of low susceptibility to landslides. Furthermore, the restoration plan will ensure that there are no land stability issues in the longer term associated with the Proposed Development. Therefore, there are no potential ground stability hazards identified for the Proposed Development Site.

The Site is identified as being located within a High Radon Area, however there are no permanent buildings onsite. Any potential impacts associated with radon and human health are assessed in Chapter 4 of this EIAR.

Dust generation during infill operations associated with the Proposed Development will be temporary in nature and appropriate operational measures including a wheel-wash and dust suppression will be implemented. Appropriate industry standard and health and safety legislative requirements will be implemented during the Construction Phase that will be protective of Site workers. The necessary measures will also be implemented to address any nuisance issues associated with dust dispersion during construction works. The potential impacts associated with airborne dust is addressed in Chapter 8 (Air and Climate) of this EIAR.

6.5.2.2 Indirect

There will be no indirect impacts associated with the Operational Phase of the Proposed Development.

6.5.2.3 Secondary

The proposal is to accept geochemically soil and subsoil from greenfield or equivalent sites as per EPA guidelines (EPA, 2020) for the restoration of the Site. Contract and procurement procedures will ensure that all infill materials imported to the Site are coming from known sources which have previously been inspected and will be in accordance with all relevant statutory consents for both the source Sites and the Proposed Development Site. Taking account of the fact that the statutory consent process would have required the necessary environmental impacts to be assessed and mitigated as appropriate, it is anticipated that the Proposed Development will have an 'neutral', 'imperceptible' and 'long term' impact on the source Sites.

The Proposed Development will allow for the recovery and re-use of good quality, inert, greenfield (or equivalent) soils that may otherwise be diverted to landfill in the absence of the Proposed Development with loss of soil and stone resources. Therefore, the Proposed Development will result in an overall 'positive', 'slight to moderate' and 'long term' impact by preventing loss of soil and geological resource to landfill and using this material for restoration purposes.

6.5.3 Potential Cumulative Impacts

Cumulative Impacts can be defined as "impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project". Effects which are caused by the interaction of effects, or by associated or off-Site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the cumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

The cumulative effects on land, soil and geology associated with the Proposed Development and other existing developments have been considered. Overall, it is considered that there will be no cumulative impacts on land, soil or geology associated with the Construction Phase and Operational Phase of the Proposed Development. It is noted that the potential impacts of dust and debris in particular on air quality arising the infilling of soil at the Site is assessed in Chapter 8 of this EIAR.

6.5.4 "Do Nothing" Impact

In the 'Do Nothing' scenario the potential impact on the receiving land soil, geology and hydrogeology environment if the Proposed Development did not proceed is considered.

In the 'Do Nothing' scenario it is considered that the potential positive impact on the land across the Site through the restoration of the Site to significantly improved agricultural lands would not occur.

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6.6 Avoidance, Remedial & Mitigation Measures

The mitigation measures, as outlined below, will ensure that there will be no significant impact on the receiving land, soil, and geology environment

6.6.1 Construction Phase

There are no significant construction works proposed at the Site with limited excavation and regrading of soil required. The Site office and welfare facilities, and the weighbridge and wheel washing facilities will be prefabricated and delivered to Site.

There will be no storage or handling of deleterious materials such as lubricants, oils etc. and any refuelling will be controlled to minimise the potential for release to ground.

Refuelling of plant and vehicles during the Construction Phase will only be permitted at the designated impermeable refuelling station onsite and will be from a road tanker brought to Site as required. The refuelling station will be fully contained and equipped for spill response. A procedure will be drawn in advance of works commencing which will be adhered to during refuelling of on-Site vehicles. This will include the following:

- Fuel will be delivered to plant on-Site by dedicated tanker;
- All deliveries to on-Site vehicles will be supervised and records will be kept of delivery dates and volumes;
- The driver will be issued with, and will carry at all times, absorbent sheets and granules to collect any spillages that may accidentally occur;
- Where the nozzle of a fuel pump cannot be placed into the tank of a machine then a funnel will be used; and
- All re-fuelling will take place in a designated appropriate bunded area. In addition, spill-kits and oil absorbent materials will be kept on-site in close proximity to the refuelling area.

Emergency procedures will be developed by the appointed Contractor in advance of works commencing and spillage kits will be available on-Site including in vehicles operating on-Site. Construction staff will be familiar with emergency procedures for in the event of accidental fuel spillages. Remedial action will be immediately implemented to address any potential impacts in accordance with industry standards and legislative requirements.

The welfare facilities, that will include a self-contained chemical toilet will be emptied by an approved contractor as part of a maintenance contract and in accordance with relevant waste management legislation

These measures will ensure that there is minimal risk to land, soils and geology associated with the Construction Phase of the Proposed Development.

6.6.2 Operational Phase

The Proposed Development will be subject to a WFP from KCC. The operator will comply with the environmental control and mitigation requirements as per the conditions of the WFP. At a minimum the following measures will be put in place to mitigate any potential impact on the receiving land, soils and geology environment.

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An Environmental Management System (EMS) will be developed for the Proposed Development and control and mitigation requirements will be strictly implemented for the duration of the Operational Phase to mitigate any potential impact on the receiving hydrological and hydrogeological environment. As part of the EMS a register of incoming materials for the Site will be maintained at all times.

Where topsoil and subsoils are segregated and retained on Site, this material will be carefully managed and maintained in order to minimise potential impact on soil quality handling of the stripped soils will be minimised in stockpiles will not be disturbed once formed. Stockpiles will be formed to minimise infiltration or accumulations of rainwater in the stockpiles.

Subject to grant of permission, only geochemically appropriate soil and subsoil from greenfield development sites or equivalent will be accepted in accordance with the conditions of the permit. Only soils that are identified as geochemically appropriate for Domain 2 as defined in the EPA guidelines (EPA, 2020) will be imported and used for the restoration of the Proposed Development Site.

Quality control procedures will be in place to check and verify all materials imported for restoration at Site are acceptable. The importation of greenfield or equivalent as per EPA guidelines (EPA, 2020) soil and stone will be subject to control procedures which will include testing for contaminants, invasive species and other anthropogenic inclusions. Contract and procurement procedures will ensure that all fill material imported to the Site are coming from a known source which has previously been inspected at the source location and approved for transport to the Proposed Development site. Any and all materials imported to the Site for recovery will be inspected on delivery and prior to unloading / placement on the Site. Any unsuitable materials will be removed from the Site in accordance with all legislative requirements.

The re-profiling of the surface will be carried out to allow for the planting of native grassland as recommended by Teagasc. The re-profiling works will be supervised by a qualified landscape architect to ensure that the filling is carried out in a manner that will derive maximum benefit from this.

There will be no storage or handling of deleterious materials such as lubricants, oils etc. and any refuelling will be controlled to minimise the potential for release to ground.

Refuelling of plant and vehicles during the Construction Phase will only be permitted at the designated impermeable refuelling station onsite and will be from a road tanker brought to Site as required. The refuelling station will be fully contained and equipped for spill response. A procedure will be drawn in advance of works commencing which will be adhered to during refuelling of on-Site vehicles. This will include the following:

- Fuel will be delivered to plant onsite by dedicated tanker;
- All deliveries to on-Site vehicles will be supervised and records will be kept of delivery dates and volumes;
- The driver will be issued with, and will carry at all times, absorbent sheets and granules to collect any spillages that may accidentally occur;
- Where the nozzle of a fuel pump cannot be placed into the tank of a machine then a funnel will be used; and

- All re-fuelling will take place in a designated impermeable area. In addition, oil absorbent materials will be kept on-Site in close proximity to the re-fuelling area.

Emergency procedures developed in accordance the EMS will be strictly implemented during the Operational Phase of the Proposed Development and spillage kits will be available on-Site including in vehicles operating on-Site. All staff will be familiar with emergency procedures for in the event of accidental fuel spillages.

In the event of a leak or spill from equipment (e.g., leak or spill from machinery during restoration works), any contaminated soil will be removed from the Site and compliantly disposed off-Site. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and EPA guidelines.

The normal measures required to prevent airborne dust emissions and associated nuisance arising from extraction activities will be in place including measures to prevent excessing wind pick up of dust and mud being spread onto the local road network and adjoining properties. This will require additional wetting at the point of dust release, dampening down during dry weather and wheel cleaning for any vehicles leaving the Site. Potential impacts and avoidance and mitigation measures associated with generation of dust are addressed in Chapter 8.

6.6.3 "Worst Case" Scenario

In a 'Worst Case' scenario, the potential accidental release and impact to the receiving land, soils and geology environment would only occur in the event of a failure of the mitigation measures. If this were to occur there would be a negative impact on the receiving environment. However, this is deemed unlikely.

6.7 Residual Impacts

There will be no significant adverse residual impacts on, or associated with the land, soils and geology associated with the Proposed Development.

The proposed Site restoration, in conjunction with the measures outlined above, will have an overall, positive, long-term impact on land, soils and geology.

The predicted impacts of the construction and operational phases are described in Table 6-5 in terms of quality, significance, extent, likelihood and duration. The relevant mitigation measures are detailed, and the residual impacts are determined which take account of the avoidance and mitigation measures.



Table 6-5: Summary of Residual Impacts

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Avoidance / Mitigation	Residual Impact
Construction Phase								
Excavation and Regrading of Soil	Soils	The Site preparation will include some limited excavation and regrading of soil	Negative	Imperceptible	Permanent	Direct	None Required.	Imperceptible
Accidental Release of Hazardous Material (e.g., fuels and oil)	Land, Soils and Geology	Potential for uncontrolled release of unidentified contaminant sources to ground	Negative	Significant	Medium Term	Direct / Worst Case	Appropriate mitigation measures to prevent the worst-case scenario occurring will be implemented during the Construction Phase.	Imperceptible
Operational Phase								
Infilling of Soil	Land Take	There will be a land take of 3.689Ha for the Proposed Development.	Positive	Moderate	Permanent	Direct	None required. The Proposed Development will improve the land for future agricultural use.	Positive
Stripping of Topsoil	Soils	Exposing underlying soil and subsoil	Negative	Imperceptible	Short term	Direct	Stripping of topsoil will strictly only be undertaken on an as required basis on a phased manner to minimise potential exposure of soils. Topsoil will be stored appropriately on site to maintain soil structure and will be used for the restoration of the Site.	Imperceptible
Recovery and Infilling of Soil	Land, Soils and Geology	In the unlikely event that that contaminated soils are inadvertently infilled to the Site there would be a	Negative	Moderate	Medium Term	Direct	Quality control procedures will be in place as well as the conditions of the WFP that will be required for	Imperceptible

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Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Avoidance / Mitigation	Residual Impact	
RECEIVED 6 DEC 2022 Kildare County Council Planning Department		potential impact on the receiving environment					the Proposed Development Therefore, any unsuitable material will be identified prior to being transported/unloaded / placed on Site.		
	Accidental Release of Hazardous Material (e.g., fuels and oil)	Land, Soils and Geology	Potential for uncontrolled release of unidentified contaminant sources to localised area of ground environment.	Negative	Moderate	Short Term	Direct	All works will be undertaken in accordance with conditions of a WFP that will be required for the Proposed Development. An EMS that will be implemented will include emergency response procedures will be strictly implemented that will enable any accidental release to be mitigated to prevent environmental harm.	Imperceptible
	Recovery of Soil	Land, Soils and Geology at Source Site	Potential loss of attribute at the source Site.	Neutral	Imperceptible	Long Term	Secondary	The Proposed Development will divert the loss of valuable soil resource to landfill. Contract and procurement procedures will ensure that all fill material imported to the Site are from a known source in accordance with industry conformity/compliance	Imperceptible

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Avoidance / Mitigation	Residual Impact
							standards and statutory obligations.	
Recovery of Soil	Offsite Land and Soils Resources	Potential loss of attribute to Landfill prevented by diverting material to the Proposed Development Site.	Positive	Slight to Moderate	Long Term	Secondary	None required.	Imperceptible



6.8 Monitoring

The Proposed Development will be subject to a WFP from KCC. The operator will comply with monitoring requirements as per the conditions of the WFP.

Monitoring of imported soil and stone for restoration materials will be undertaken in accordance with the waste acceptance criteria and procedures set out in the WFP to ensure that only clean inert materials free of contaminants, invasive species and other anthropogenic inclusions is infilled at the Site.

In the event that any soil must be stockpiled before infilling, the stockpiles will be monitored for stability and to ensure there are no emissions such as dust or runoff.

6.9 Interactions

6.9.1 Public Health

Appropriate industry standard and health and safety legislative requirements will be implemented during the construction and operational phases of the Proposed Development that will be protective of Site workers. It is noted that specific issues relating to Public Health associated with the Proposed Development are set out in Chapter 4 of this EIAR.

6.9.2 Landscape and Visual

An assessment of the potential impact of the Proposed Development on the landscape and visual environment is included in Chapter 10 of this EIAR. Procedures for restoration of landscape are set out in Chapter 10 of this EIAR.

6.9.3 Hydrology and Hydrogeology

An assessment of the potential impact of the Proposed Development on the hydrological and hydrogeological environment is included in Chapter 7 of this EIAR. Procedures for protection of water courses and the underlying bedrock aquifer are set out in Chapter 7 of this EIAR.

6.9.4 Biodiversity

An assessment of the potential impacts of the Proposed Development on the Biodiversity of the Site, with emphasis on habitats, flora and fauna which may be impacted as a result of the importation of soil and stone to the Site for recovery are included in Chapter 5 of this EIAR. It also provides an assessment of the impacts of the Proposed Development on habitats and species, particularly those protected by national and international legislation or considered to be of particular conservation importance and proposes measures for the mitigation of these impacts.

6.9.5 Air Quality and Climate

The infilling of soils at the Proposed Development Site has the potential to generate nuisance impacts (i.e., dust). An assessment of the potential impact of the Proposed Development on air quality and climate is included in Chapter 8 of this EIAR.

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6.9.6 Material Assists – Waste

The Proposed Development will include Site clearance and off-Site removal for appropriate and compliant disposal/recovery of anthropogenic material including silage film wrapping, stockpiled C&D materials, bagged bark mulch, timber pallets, general waste materials (e.g., plastics, timber pallets, empty oil drums, scrap metal etc.). An assessment of the potential impact of the Proposed Development on the material assets including waste management is included in Chapter 12 of this EIAR.

6.10 Difficulties Encountered When Compiling

There were no difficulties encountered in compiling this land, soils and geology hydrogeology Chapter.

6.11 References

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7 HYDROLOGY

7.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) provides a description of the hydrology and hydrogeology (water) environment within and immediately surrounding the site of the Proposed Development and an assessment of the potential impacts of the Proposed Development on hydrology and hydrogeology and sets out any required mitigation measures where appropriate.

The principal objectives of this Chapter are to identify:

- Hydrological and hydrogeological characteristics of the receiving environment at the Proposed Development site;
- Potential impacts that the Proposed Development may have on the receiving water environment;
- Potential constraints that the environmental attributes may place on the Proposed Development;
- Required mitigation measures which may be necessary to minimise any adverse impacts related to the Proposed Development; and
- Evaluate the significance of any residual impacts.

7.1.1 Quality Assurance and Competence

This Chapter of the EIAR was written by Gareth Carroll BAI, Senior Environmental Consultant with Enviroguide Consulting with 10 years' experience of environmental assessment of brownfield and greenfield sites. The Chapter was reviewed by Claire Clifford BSc., MSc., PGeo., EurGeol who is Technical Director of the Contaminated Land and Hydrogeology Division of Enviroguide Consulting and is a Professional Geologist with the Institute of Geologists of Ireland and has extensive experience in preparing environmental assessments for a range of project types and geological and hydrogeological site settings.

7.1.2 Description of the Proposed Development

A fill plan has been drawn up for the importation of 68,970m³ of soil to fill Area 1, and 16,670m³ to fill Area 2, equating to a total of 85,640m³ (approximately 128,460 tonnes) of soil and sub-soil. A volume to weight conversion factor of 1.50 is taken from the Waste Management (Land-fill Levy) Regulations, 2008, SI 199 of 2008. The surface layer will comprise of 300mm of topsoil which will be graded to an even surface finish. It is proposed even out the levels of the site in order to allow for the safety of grazing animals. Once the importation is complete the Applicant will seed the land in line with Teagasc guidelines and return it to agricultural use. The proposed new levels and fill plan are detailed in Drawings P-01 to P-07 prepared by Enviroguide Consulting, 2022 (refer to Appendix A).

Once planning permission is obtained, it is intended to apply to Kildare County Council for a Waste Facility Permit. Material will be accepted in accordance with the conditions of the permit. As part of the Environmental Management Plan a register of incoming materials for the site will be maintained at all times. The only List of Waste (LoW) code accepted on site will be 17 05 04 - Soil and Stones other than those mentioned in 17 05 03.

It is proposed to accept material onto the site from 08.00 until 18.00 Monday to Friday and 08.00 to 14.00 on Saturday. It is not proposed to operate on Sundays or Bank Holidays.

Temporary welfare facilities will be located in the northeast of the site as per Figure 2-2, Site Layout Plan and harvested rainwater will be used in the wheel wash or for dust suppression.

Soil will be imported using Heavy Goods Vehicles from contractors authorised to transport waste, coming from a known source which has previously been inspected. In the interest of maintaining quality of incoming material the number of contractors delivering material to the site will be limited to a single contractor. Prior to deposition the consignment note for each load will be inspected by the site supervisor to ensure that the material is acceptable, and each load will be evaluated in accordance with the site's waste acceptance procedure.

The site has the potential to import inert soil and stones for land improvement for agriculture uses and will also improve drainage. As the site elevations decrease from across the site, with the most acute declines located to the north, it is proposed to raise the northern, central and southern sections of the site to come in line with the boundary elevations, refer to Drawings P-04 and P-05 for elevations. The proposed plant will consist of a tracked bulldozer for placing the soil and compressing it to a level that will permit good drainage. An excavator may be brought on to site from time to time to construct internal haul roads.

Thus, the focus of the proposed filling is concentrated in the central and eastern areas of the site. Cut and fill cross sections for the Proposed Development are attached as part of this planning application (refer to drawings included as Appendix A). Details of existing ground level, proposed change in elevation and final fill level are detailed in Drawings P-01 to P-07. It is proposed to carry this work out over a 5-year period, subject to the availability of appropriate soil, to allow the soil to settle naturally with minimal compaction. The soil and subsoils will be mixed, to minimise compaction and improve drainage.

Filling operations will be confined to a selected area of the site at any one time with each area being restored in a timely manner from commencement of the next phase.

A 10-meter buffer and silt fence will be maintained along the eastern boundaries of the site where no soil importation will take place to protect surface waters and to ensure that there are no offsite nuisances created by the site.

The re-profiling of the surface will be carried out to allow for the planting of native grassland as recommended by Teagasc. The re-profiling works will be supervised by a qualified landscape architect to ensure that the filling is carried out in a manner that will derive maximum benefit from this.

The Proposed Development site layout is presented in Figure 7-1.

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7.2 Study Methodology

7.2.1 Regulations and Guidance

The methodology adopted for the assessment has regard to the relevant guidelines in particular the following:

- Council Directive 80/68/EEC, 1979. On the protection of groundwater against pollution caused by certain dangerous substances. Council of European Communities.
- Council Directive 2006/118/EEC, 2006. On the protection of groundwater against pollution and deterioration. European Parliament and the Council of European Communities.
- Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy with amendments 2455/2001/EC, 2008/32/EC and 2008/105/EC (Water Framework Directive, WFD);
- Department of the Environment, Heritage and Local Government, Environmental Protection Agency and Geological Survey of Ireland, 1999. Groundwater Protection Schemes (Groundwater Protection Schemes, 1999);
- Department of the Environment, Heritage and Local Government, 2009. Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DEHLG, 2009);
- Kildare County Development Plan 2017 – 2023;
- Draft Kildare County Development Plan 2023 – 2029;
- Environmental Protection Agency, May 2022. Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022);
- Institute of Geologists of Ireland Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013);
- Local Government, July 1990. No. 21.1990. Local Government (Water Pollution) (Amendment) Act, 1990.
- Local Government, March 1977. No. 01/1977. Local Government (Water Pollution) Act, 1977.
- National Roads Authority, 2009. Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009);
- OPR, June 2021. OPR Practice Note PN02. Environmental Impact Assessment Screening (OPR, 2021)
- S.I. No. 272/2009 - European Communities Environmental Objectives (Surface Waters) Regulations 2009 including amendments S.I. No. 327/2012, S.I. No. 386/2015 and S.I. No. 77/2019.
- S.I. No. 9 of 2010 - European Communities Environmental Objectives (Groundwater) Regulations 2010 including amendments S.I. No. 149 of 2012 and S.I. No. 366 of 201; and
- WFD Working Group, 2005. Guidance on the Assessment of the Impact of Groundwater Abstractions (WFD, 2005).

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7.2.2 Phased Approach

A phased approach was adopted for this EIAR in accordance with Environmental Protection Agency (EPA) and Institute of Geologists of Ireland (IGI) guidelines as set out above and is described in the following sections.

Element 1: An initial Assessment and Impact Determination stage was carried out by Enviroguide Consulting to establish the project location, type and scale of the Proposed Development, the baseline conditions, and the type of hydrological and hydrogeological environment, to establish the activities associated with the Proposed Development and to undertake an initial assessment and impact determination.

This stage of the assessment included a desk top study that comprised a review of published environmental information for the Proposed Development Site. The study area, for the purposes of assessing the baseline conditions for the Hydrology and Hydrogeology Chapter of the EIAR, extends beyond the Site boundaries and includes potential receptors within a 2.0km radius of the Proposed Development Site. The extent of the wider study area was based on the Institute of Geologists of Ireland (IGI) Guidelines (IGI, 2013) that recommends a minimum distance of 2.0km radius from the Proposed Development Site. This distance was reviewed during the desk top studies and revised to 15km, to identify potentially sensitive habitats which is a distance set out in AA / NIS methodologies (DEHLG, 2009). Designated and protected areas potentially hydraulically connected to the Proposed Development Site were also considered. The purpose of this increased search radius was to ensure that any potential hydrogeological / hydrological connections to sensitive habitats were identified.

The desk study involved collecting all the relevant data for the Site and surrounding area including published information and details pertaining to the Proposed Development provided by the Applicant.

The Element 1 stage of the assessment was completed by Enviroguide Consulting and included the review of the following sources of information:

- Environmental Protection Agency (EPA) webmapping (EPA, 2022);
- Geological Survey Ireland (GSI) Datasets Public Viewer and Groundwater webmapping (GSI, 2022);
- National Parks and Wildlife Services (NPWS) webmapping (NPWS, 2022);
- Ordnance Survey Ireland (OSI) webmapping (OSI, 2022);
- Water Framework Directive Ireland (WFD) webmapping (WFD, 2022);
- Teagasc webmapping (Teagasc, 2022);
- Office of Public Works (OPW) database on historic flooding and the Catchment Flood Risk Assessment and Management (CFRAM) maps (OPW, 2022); and
- Information provided by the Applicant pertaining to the design proposals for the Proposed Development.

Element 2: Based on a review of the information compiled and assessed in Element 1, a direct and indirect site investigation and studies stage was carried out to determine site specific details, refine the conceptual site model and to inform the impact assessment of the Proposed Development on the receiving hydrological and hydrogeological environment. The scope of work for site investigation at the Site carried out for Element 2 included:

- Site walkover surveys to establish the environmental site setting and baseline conditions at the Site relevant to the hydrological and hydrogeological environment was undertaken by Enviroguide Consulting on the 4th May 2022, the 19th May 2022 and the 31st August 2022; and
- Groundwater and surface water monitoring and sampling on the 13th September 2022 including collection of samples for laboratory analysis at a UKAS accredited laboratory, Element Materials Technology.

The site investigation and monitoring locations are presented in Figure 7-6.

The reports and documents reviewed and evaluated for Element 2 of this assessment included the following:

- Element Materials Technology Ltd. Laboratory Analytical Report, September 2022. Report Reference 22/14927.

The site investigation results are discussed in the relevant sections below and referenced documents are provided in the appendices to the EIAR.

Element 3: Evaluation of Mitigation Measures, Residual Impacts and Final Impact Assessment were based on the outcome of the information gathered in Element 1 of the assessment. Mitigation measures to address all identified adverse impacts that were identified in Element 1 of the assessment were considered in relation to the Construction Phase and Operational Phase of the Proposed Development. These mitigation measures were then considered in the impact assessment to identify any residual impacts.

Element 4: Completion of the Hydrology and Hydrogeology Chapter of the EIAR which includes all the associated figures and documents.

7.2.3 Description of Importance of the Receiving Environment

The National Roads Authority (NRA) criteria for estimation of the importance of hydrogeological features at the Proposed Development site during the Environmental Impact Assessment (EIA) stage, as documented by IGI (IGI, 2013) are summarised in Table 7-1.



Table 7-1. Criteria for Rating Site Importance of Hydrogeological Features

Importance	Criteria	Typical Example
Extremely High	Attribute has a high quality or value on an international scale.	Groundwater supports river, wetland or surface water body ecosystem protected by European Union (EU) legislation e.g., SAC or SPA status.
Very High	Attribute has a high quality or value on a regional or national scale.	Regionally Important Aquifer with multiple wellfields. Groundwater supports river, wetland, or surface water body ecosystem protected by national legislation – e.g., NHA status. Regionally important potable water source supplying >2500 homes Inner source protection area for regionally important water source.
High	Attribute has a high quality or value on a local scale.	Regionally Important Aquifer. Groundwater provides large proportion of baseflow to local rivers. Locally important potable water source supplying >1000 homes. Outer source protection area for regionally important water source. Inner source protection area for locally important water source.
Medium	Attribute has a medium quality or value on a local scale.	Locally Important Aquifer Potable water source supplying >50 homes. Outer source protection area for locally important water source.
Low	Attribute has a low quality or value on a local scale.	Poor Bedrock Aquifer. Potable water source supplying <50 homes.

7.2.4 Description and Assessment of Potential Impact

Impacts will vary in quality from negative, to neutral or positive. The effects of impacts will vary in significance on the receiving environment. Effects will also vary in duration. The terminology and methodology used for assessing the 'impact' significance and the corresponding 'effect' throughout this Chapter is described in



Table 7-2.

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Table 7-2. Assessment of Potential Impacts Terminology and Methodology

Quality of Effects / Impacts	Definition
Negative	A change which reduces the quality of the environment
Neutral	No effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error.
Positive	A change that improves the quality of the environment
Significance of Effects / Impacts	Definition
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration, or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration, or intensity significantly alters a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.
Duration of Effects / Impacts	Definition
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting one year or less
Short-term	Effects lasting one to seven years
Medium-term	Effects lasting seven to fifteen years
Long-term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration

7.3 The Existing and Receiving Environment (Baseline Situation)

7.3.1 Site Location and Description

The Site of the Proposed Development has a total area of 7.243 hectares (Ha) and is located in Thomastown, Johnstown Bridge, Co. Kildare. The Site is accessed off the L5014 local road which connects to the R402 regional road located approximately 600 metres to the east of the Site. The village of Johnstown Bridge is located approximately 1.81km to the east of the Site and Kilshanroe village is located approximately 1.9km to the southwest.

The Site comprises a historic sand and gravel quarry which includes an extraction area in the north and west/southwest portion of the Site and an unworked area in the central and southeast portion of the Site. There is an open waterbody and two smaller ponds located in the central portion of the Site.

The Proposed Development Site is bounded to the north, south and west by agricultural land and the Thomastown Stream (River Waterbody Code: IE_EA_07B020200) adjoins the eastern boundary of the Site.

The Site is located within a rural setting with the surrounding land uses comprising predominantly agricultural land with one-off residential properties and a number of one-off commercial facilities.

The Proposed Development site location is presented in Figure 7-2.

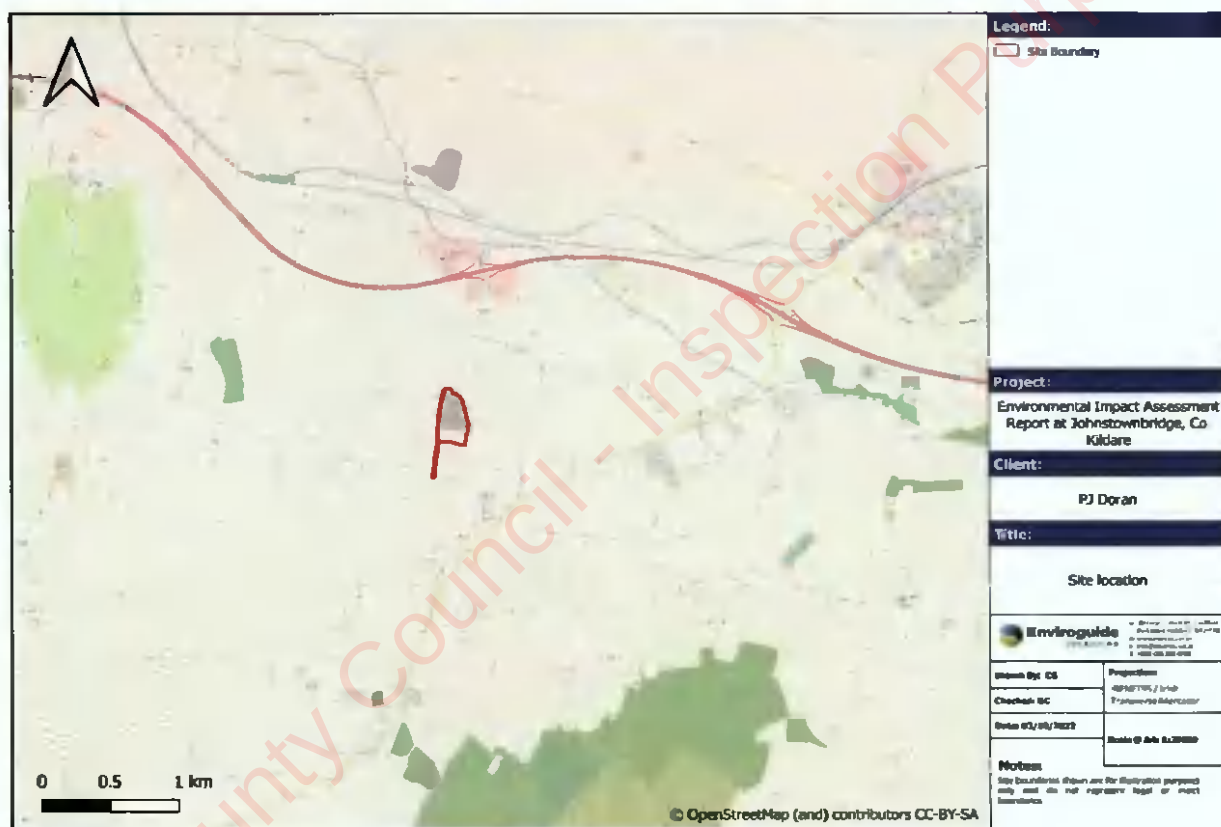


Figure 7-2: Site Location

7.3.2 Topography

The topography surrounding the Site comprises gently rolling farmland with elevations of approximately 80meters above Ordinance Datum (maOD) towards the south of the Site which slope slightly towards the M4 motorway located approximately 0.79km north of the Site (which lies at approximately 70maOD).

The topographical survey of the Site indicated that the topography ranges from a high point 79mOD in the unworked area of the quarry in the central portion of the Site to 74mOD at the quarry floor in the north, west and south of the Site. There is a steep slope between the quarry

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pit floor at approximately 74mOD and the western boundary of the Proposed Development Site at 77mOD.

It is noted that there was no subsidence observed at the Site and on lands immediately adjoining the existing quarry during the site walkover surveys undertaken by Enviroguide Consulting on the 4th May 2022, the 19th May 2022 and the 31st August 2022.

The topographical survey for the Proposed Development Site is included in Drawing No. P-02 included in Appendix A and cross sections of the Proposed Development are included in Drawing No. P-04 and P-05 (also refer to Appendix A).

7.3.3 Rainfall

Monthly rainfall data available for 1km x 1km grids (for the period 1981 to 2010) was sourced from Met Éireann (Walsh, 2012) and is presented in Table 7-3.

Table 7-3: Long Term Mean Monthly Rainfall Data (mm) (Walsh, 2012)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
80	58	65	61	61	69	67	80	71	92	82	83	870
Note: 1km x 1km Irish Grid Coordinates selected for the Site = X (Easting): 274000, Y (Northing):240000												

The closest the synoptic meteorological station to the Site is at Dunsany (Grange) located approximately 18.5km northeast of the Site. The average potential evapotranspiration (PE) for Dunsany (Grange) for the period 2019 to 2021 (Met Éireann, 2022) is presented in Table 7-4.

Table 7-4: Average Potential Evapotranspiration (Met Éireann, 2022)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
10.7	21.0	35.3	56.2	81.2	80.4	84.2	65.9	45.4	25.8	11.3	8.9	526.3

The GSI (GSI, 2022) have calculated an Effective Rainfall (ER) value of between 430.5 and 457.1mm/year across the Site.

7.3.4 Hydrology

The site has been mapped by the EPA (EPA, 2022) to be within the Boyne WFD Catchment (ID: 07), the Boyne Hydrometric Area (HA07), the Boyne_SC_020 Sub-Catchment, (Sub-catchment ID: 07_16) and the Blackwater (Longwood)_030 WFD River Sub Basin (European Code: IE_EA_07B020200).

The closest surface water feature to the Site is recorded on the EPA database (EPA, 2022) as the Thomastown Stream (River Waterbody Code: IE_EA_07B020200). The Thomastown Stream adjoins the eastern boundary of the Site and flows north for approximately 0.96km before converging with the Kilmorebrannagh Stream (River Waterbody Code: IE_EA_07B020200). The Kilmorebrannagh Stream flows north for approximately 0.59km before converging with the Blackwater (Longwood) River (River Waterbody Code: IE_EA_07B020200). The Blackwater (Longwood) River flows north for approximately 12.16km before discharging to the River Boyne (River Waterbody Code: IE_EA_07B040900).

The Kilshanchoe River (River Waterbody Code: IE_EA_07B020300) is located approximately 1.22km west of the Site at its closest point and flows to the north before converging with the Blackwater (Longwood) River approximately 3.13km northeast of the Site.

The Royal Canal Main Line (Boyne) (EU Code: IE_07_AWB_RCMLE) is located approximately 1.31km north of the Site.

It is noted that during the site walkover surveys on the 4th of May 2022 and the 19th of May 2022 standing water was encountered within the Thomastown Stream in the vicinity of the site, however this was observed to be dry during the site walkover survey undertaken on the 31st of August 2022.

There are three (3 No.) open waterbodies located in the central portion of the Site. Additional standing pools of water were identified at the northern and southern edges of the Site during the site walkover surveys undertaken by Enviroguide Consulting on the 4th May 2022 and the 19th May 2022. It is noted that these standing pools of water were observed to be dry during the site walkover survey undertaken on the 31st of August 2022.

An open drainage channel was identified in the centre of the Site along the eastern boundary during the site walkover surveys undertaken on the 4th of May 2022, the 19th of May 2022 and the 31st of August 2022 (refer to Figure 7-3). The open drainage channel, which was identified to discharge to the Thomastown Stream, was observed to be dry at the time of inspection.

The surface water features mapped by the EPA within a 2km radius of the Site and identified during the site walkover surveys are presented in Figure 7-3.

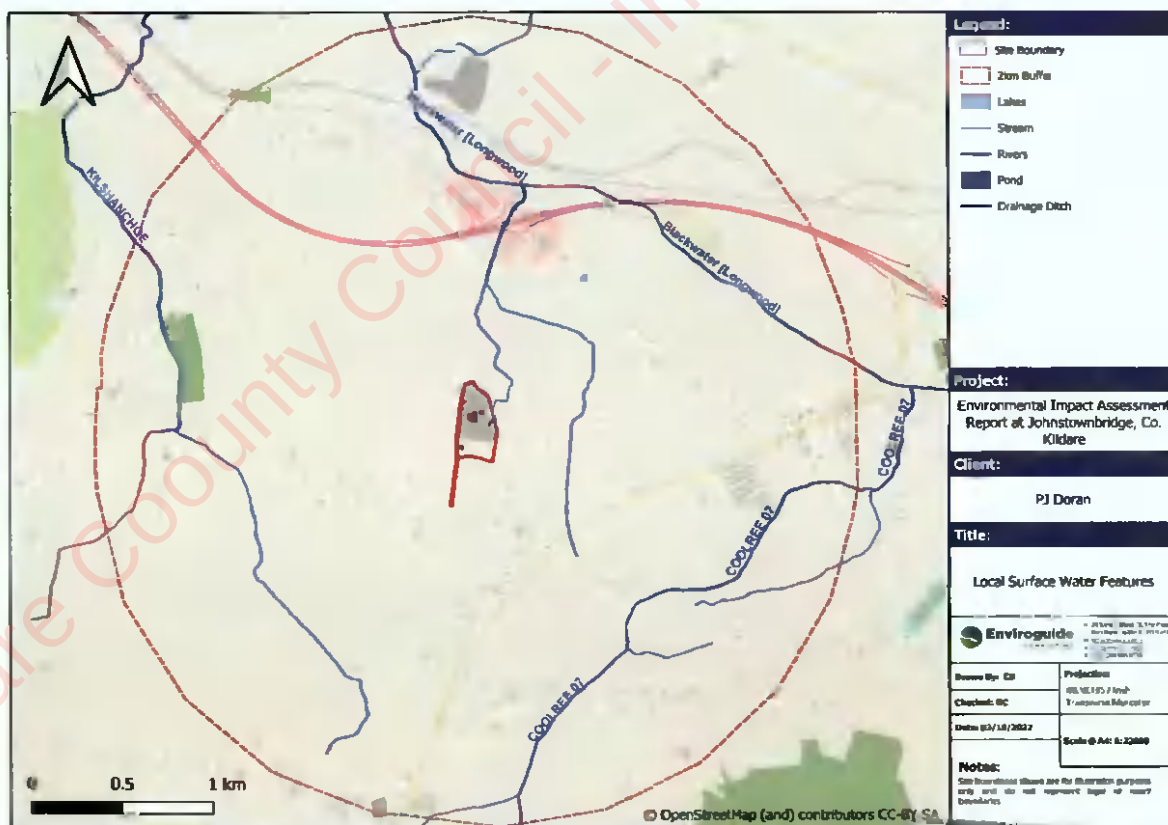


Figure 7-3: Local Surface Water Features

7.3.5 Flood Risk

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The Eastern Catchment Flood Risk Assessment and Management (CFRAM) and National Indicative Fluvial Mapping (NIFM) flood maps published by the OPW (OPW, 2022) were consulted, however there is no available published data for the Site and surrounding area in regards fluvial, pluvial and coastal flooding.

The OPW database (OPW, 2022) does not contain mapped information in relation to pluvial flooding for the vicinity of the Site however does indicated records for 'GSI Winter 2015/2016 Surface Water Flooding'. These records for surface water mapped correlate with the open water ponds at the Site and localised ponding on adjoining fields.

The OPW database (OPW, 2022) and GSI database (GSI, 202) does not contain mapped information in relation to groundwater flooding for the vicinity of the Site. It is noted that during the site walkover surveys undertaken by Enviroguide Consulting on the 4th May 2022 and the 19th May 2022, standing water was identified in the northern and southern portions of the Site. Based on the measured groundwater levels during the site walkover surveys it is considered that the standing water is likely hydraulically connected with the underlying groundwater (refer to Section 7.3.10) and these ponds may be subject to fluctuation with variations in groundwater levels.

The OPW national flood hazard mapping (NFHM) data base was consulted (OPW, 2022) and there is a recorded past recurring flood event (Flood ID 1298) mapped at a location adjoining the Site entrance. The OPW recorded report for the flood event indicates that this for the area of Thomastown and describes the event as '*Thomastown – Stream overflow its banks after significant rainfall. Last flooded November 2000*'. The NHFM notes that '*Past Flood Event Locations are represented on the map with a point symbol placed at the approximate location of the flood.*' As there was no stream identified at the site entrance during the site walkovers on the 4th May 2022 and the 19th May 2022 and taking account of the OPW reference to 'approximate location' it is concluded the mapped flood event does not relate to the Site entrance.

7.3.6 Soil and Geology

Soils and geology are assessed in Chapter 6 of this EIAR and summarised as follows:

- Soil is mapped by Teagasc (Teagasc, 2022) as moderately drained fine loamy drift with limestones of the Elton (1000x) soil series (Teagasc, 2022).
- Subsoils is mapped by the GSI (GSI, 2022) as 'gravels derived from limestones (GLs)' in the central and northern portions of the Site, 'till derived from limestones (TLs)' in the northwest and southwest corners of the Site and 'lacustrine sediments' in the southeast corner of the Site.
- Bedrock is mapped by the GSI (GSI, 2022) as the Lucan Formation (New Code: CDLUCN) comprising dark-grey to black, fine-grained, occasionally cherty, micritic limestones that weather paler, usually to pale grey. There are rare dark coarser grained calcarenitic limestones, sometimes graded, and interbedded dark-grey calcar.

7.3.7 Aquifer Classification

The GSI provides a methodology for aquifer classification based on resource value as regionally important, locally important, and poor.

The GSI (GSI, 2022) has classified the bedrock of the Lucan Formation beneath the Site and surrounding area as a Locally Important Aquifer (Lm) (i.e., bedrock which is generally moderately productive). Locally Important Aquifers (Lm) are capable of supplying 'good' yields (100-400m³/day), aquifer storage is moderate and groundwater flow paths can be up to several kilometres in length predominantly through fractures, fissures and joints. (GSI, 2017). Furthermore, Locally Important Aquifers (Lm) likely provide a substantial groundwater contribution to surface waters as baseflow and large (>2,000 m³/d), dependable springs may be associated with these aquifers (GSI, 2017).

The Kilmurry locally important gravel aquifer (Lg) is mapped beneath the eastern boundary of the Site. Similar to a Regionally Important Sand/Gravel Aquifer (Rg), locally important gravel aquifer (Lg) are capable of supplying 'excellent' yields (>400m³/day), although with limited amounts of recharge available to meet abstractions.

The bedrock and gravel aquifer map is presented in Figure 7-4.

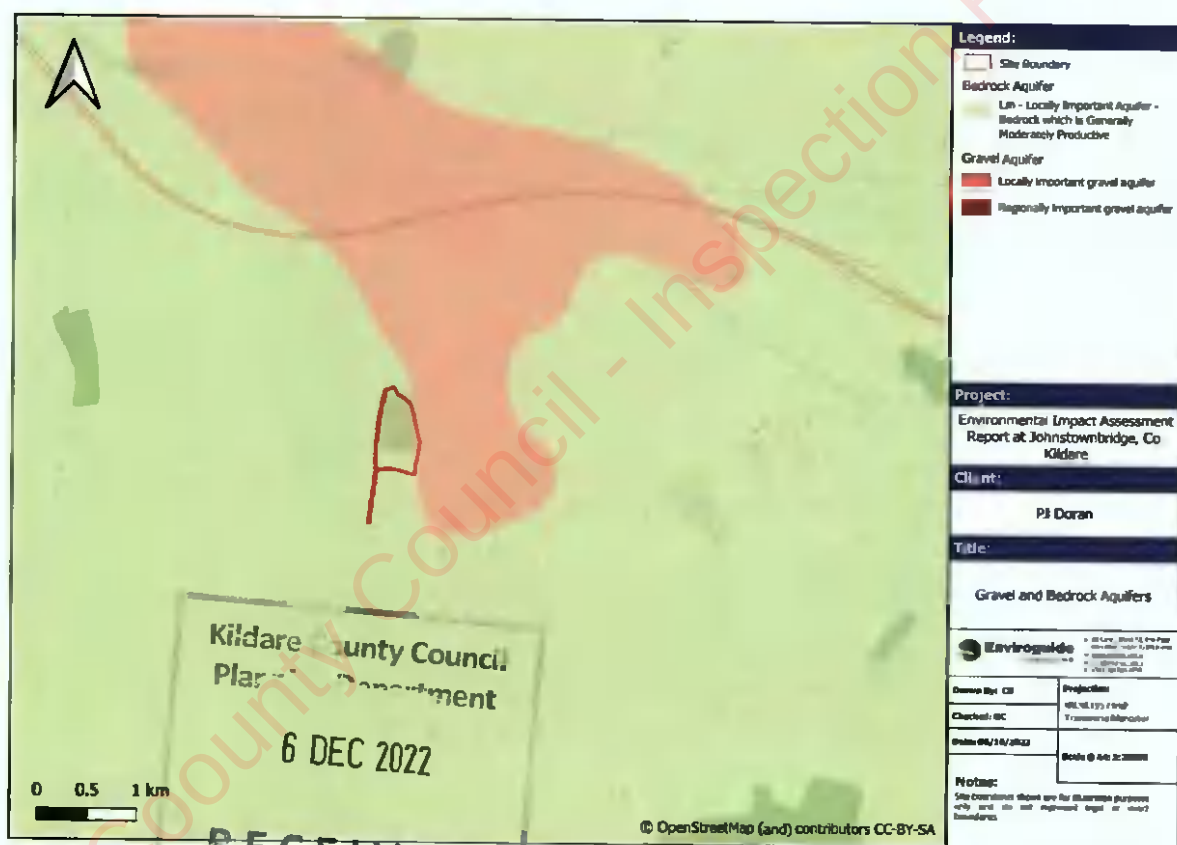


Figure 7-4: Gravel and Bedrock Aquifers

7.3.8 Aquifer Vulnerability Rating

The vulnerability categories, and methods for determination, are presented in the Groundwater Protection Schemes publication (DEHLG/EPA/GSI, 1999) and summarised in Table 7-8. The publications state that 'as all groundwater is hydrologically connected to the land surface, it is the effectiveness of this connection that determines the relative vulnerability to contamination. Groundwater that readily and quickly receives water (and contaminants) from the land surface is considered to be more vulnerable than groundwater that receives

water (and contaminants) more slowly and in lower quantities. The travel time, attenuation capacity and quantity of contaminants are a function of the following natural geological and hydrogeological attributes of any area:

- the subsoils that overlie the groundwater;
- the type of recharge - whether point or diffuse; and
- the thickness of the unsaturated zone through which the contaminant moves'.

Table 7-5: Vulnerability Mapping Criteria (DEHLG/EPA/GSI, 1999)

Subsoil Thickness	Hydrogeological Requirements				
	Diffuse Recharge			Point Recharge	Unsaturated Zone
	Subsoil Permeability & Type			(Swallow holes, losing streams)	(sand & gravel aquifers only)
	High permeability (sand & gravel)	Moderate permeability (sandy subsoil)	Low permeability (clayey subsoil, clay, peat)		
0-3m	Extreme	Extreme	Extreme	Extreme (30m radius)	Extreme
3-5m	High	High	High	N/A	High
5-10m	High	High	Moderate	N/A	High
>10m	High	Moderate	Low	N/A	High

Notes: (i) N/A = not applicable (ii) Permeability classifications relate to the material characteristics as described by the subsoil description and classification method.

The GSI have assigned a groundwater vulnerability rating of "High" (H) for the groundwater beneath the central and northern portions of the Site and 'Moderate (M)' beneath the southern portion of the Site. It is noted that, given the extent of the existing quarry excavation works and based on the measured groundwater levels during the site walkover surveys at the Site (refer to Section 7.3.10) it is considered that the actual vulnerability at the Site may be locally 'Extreme (E)'.

The GSI Groundwater Vulnerability Map is presented in Figure 7-5.



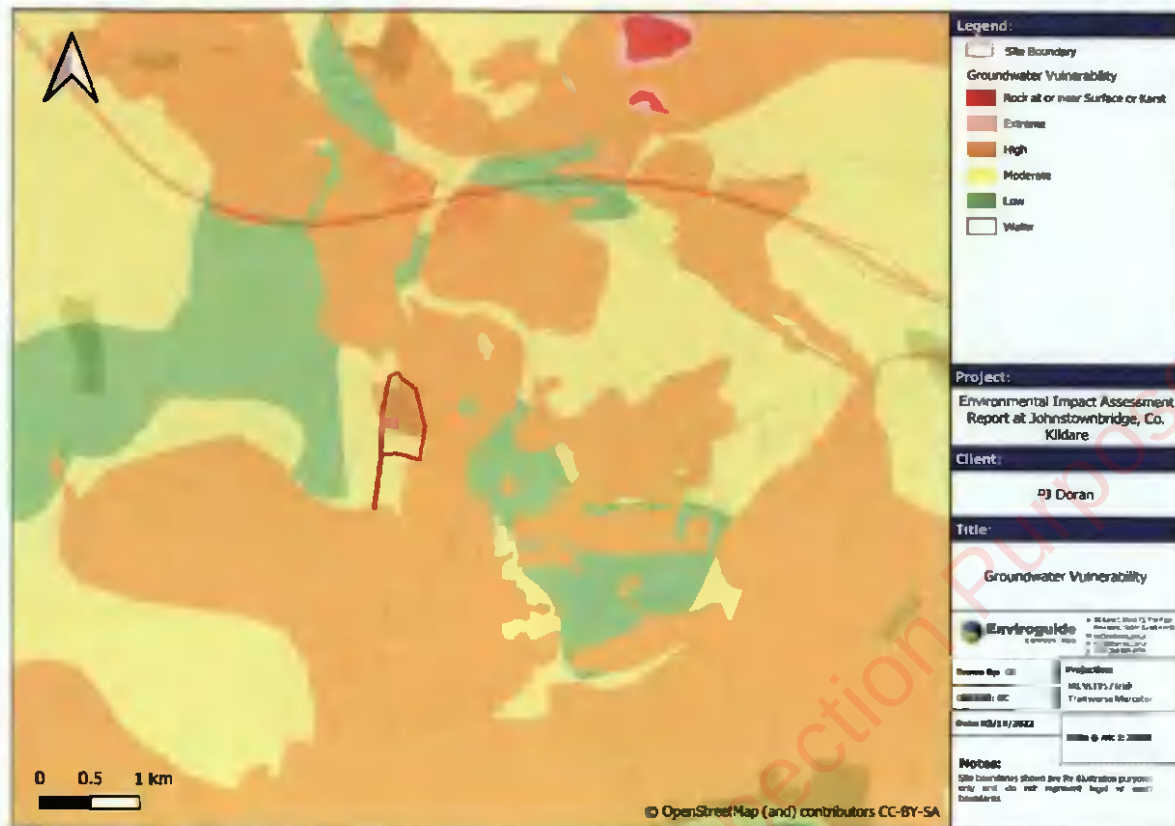


Figure 7-5: Groundwater Vulnerability

7.3.9 Groundwater Body

The bedrock aquifer beneath the site is within the Trim Groundwater Body (GWB) (EU Code: IE_EA_G_002). that covers some 669km² and occupies an area across Co. Meath, Co. Louth, Co. Kildare and Co. Offaly (GSI, 2022).

7.3.10 Regional and Local Groundwater Flow Regimes

Recharge in the vicinity of the Site is likely to be diffuse through the exposed sands and gravels across the Site. Regionally in areas where there is karstification, there may also be point recharge, typically at swallow holes where a large amount of concentrated recharge occurs in a small area (Trim GWB Report). It is noted that there is evidence that in some areas of the Trim GWB the limestone is karstified however, there are no recorded karst landforms features at the Site or within a 2km radius of the Site (GSI, 2022). As detailed in Section 7.3.3, the GSI (GSI, 2022) have calculated an ER value of between 430.5 and 457.1mm/year across the Site. The GSI (GSI, 2022) have calculated a recharge coefficient of 85% across the central and northern portions of the Site, where the majority of the historic quarrying activities have taken place, 60% in the southwest and northwest corners of the Site, 42.5% along the eastern boundary of the site and 22.5% in the southeast corner of the Site. It is noted that a recharge cap has not been applied for the area in the vicinity of the Site.

The main discharge mechanism for this aquifer is as baseflow to the River Boyne and its tributaries. Based on the measured groundwater levels (refer to Table 7-6), it is considered that the groundwater beneath the Site is likely hydraulically connected with the Thomastown

Stream. Regionally, discharge from the aquifer will also occur via springs in areas where there is karstification (GSI, 2022).

As documented by the GSI (Trim GWB Report), the nature of groundwater flow in this aquifer will be determined by the degree of karstification and fracturing and the purity of the limestones. At the Site where the limestone is less karstified the flow systems will be shallower and more diffuse and will flow mainly along fractures. However, regionally in areas of highly karstified limestone, groundwater flow will be concentrated into conduits, which may draw water very deep underground.

The findings of the groundwater and surface water elevation survey undertaken by Enviroguide Consulting on the 19th May 2022, the 31st August 2022 and the 13th September 2022 are presented in Table 7-6.

Table 7-6: Groundwater and Surface Water Elevation Survey

Monitoring Well	Water Level (mbGL)	Water Level (maOD)	Water Level (mbGL)	Water Level (maOD)	Water Level (mbGL)	Water Level (maOD)
	19/05/2022		31/08/2022		13/09/2022	
MW1	1.54	73.27	1.80	73.02	1.72	73.09
MW2	1.75	73.39	2.03	73.11	1.98	73.16
SW1	-	72.98	-	72.94	-	-
SW2	-	73.14	-	73.04	-	-
SW3	-	73.25	-	72.98	-	-
SW4	-	73.15	-	72.91	-	-
SW5	-	73.51	-	DRY	-	-
SW6 (Thomastown Stream)	-	73.06	-	DRY	-	-

The inferred groundwater flow direction beneath the Site is to the north and northeast towards the Thomastown Stream and the Blackwater (Longwood) River (refer to Figure 7-6). Cross sections of the Site with the identified groundwater and surface water elevations is presented in Figure 7-7.

Based on the measured groundwater and surface water elevations (refer to Table 7-6 and Figure 7-6), there is a hydraulic connection between surface water and groundwater including the Thomastown Stream (SW6), the open waterbodies (ponds) identified in the central portion of the Site.





Figure 7-6: Inferred Groundwater Flow Direction (19th May 2022)

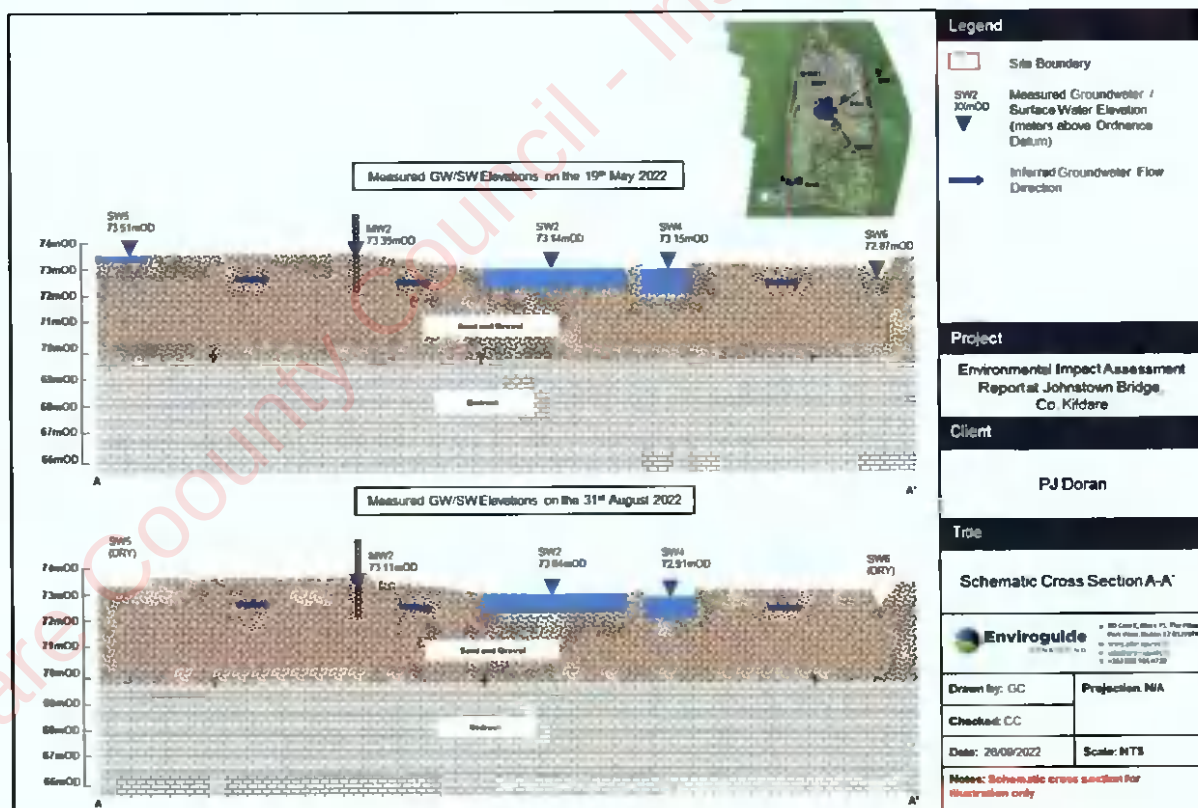


Figure 7-7. Schematic Cross Section A-A'

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A search of the GSI groundwater well database was conducted to identify registered wells and groundwater sources in the surrounding area. There are a total of fifteen (15No.) groundwater sources of unknown use, five (5No.) groundwater sources of agricultural and domestic use, seventeen (17No.) groundwater sources of domestic use and three (3No.) public supply groundwater sources recorded by the GSI (GSI, 2022) within a 2km radius of the Site.

There are no surface water drinking water sources identified by the EPA (EPA, 2022) within a 2km radius of the Site or hydraulically downgradient of the Site.

The groundwater wells, springs and groundwater SPAs within a 2km radius of the Site is presented in Figure 7-8.

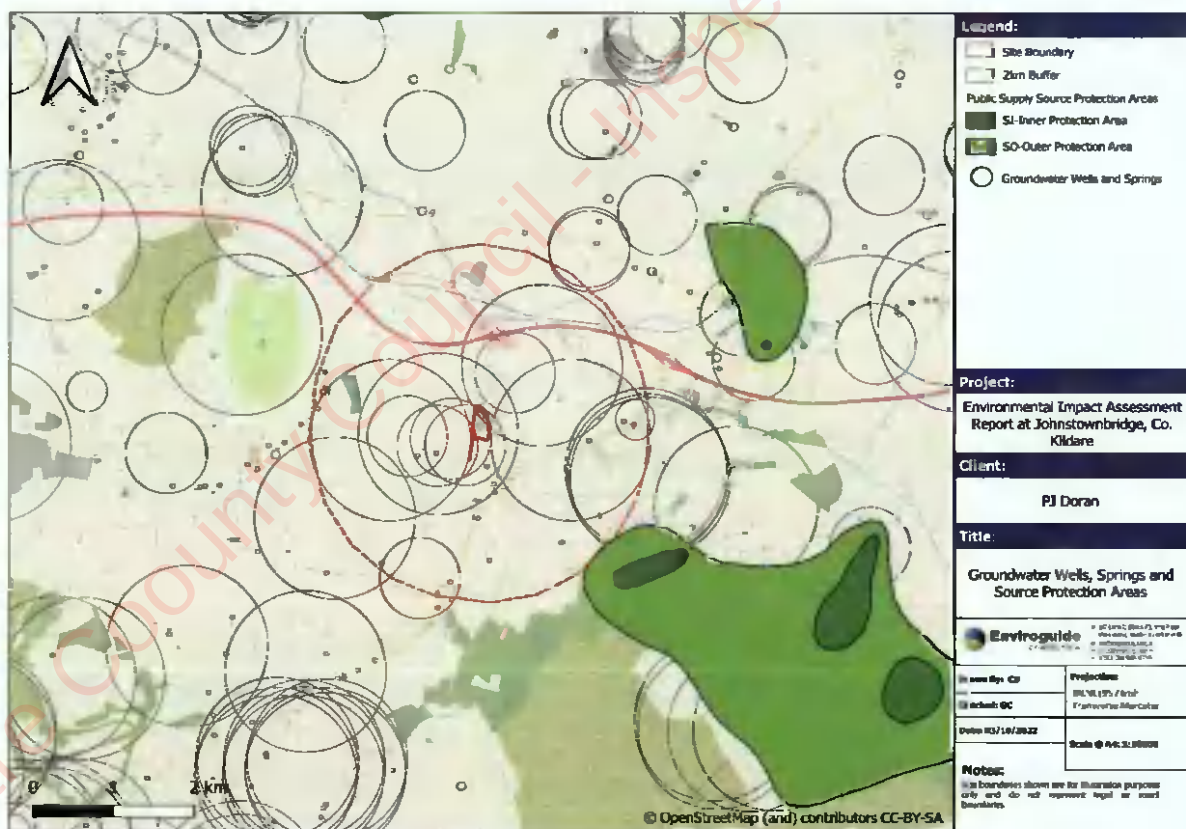


Figure 7-8. Groundwater Wells, Springs and Groundwater SPAs

7.3.12 Water Quality

The EPA Q-Value is a system of water quality rating based on the biological quality of the water body and abundance for specific invertebrate species. A summary of the Q-value for the operational EPA monitoring locations along the River Blackwater (Longwood) is presented in Table 7-7. It is noted that there are no operational or historic EPA monitoring locations located along the Thomastown Stream. The EPA data indicates that there is an upward trend in Total Ammonia, Total Oxidised Nitrogen and Ortho-phosphate for the water course for the period 2013-2018 (EPA, 2022).

Table 7-7: EPA Monitoring Stations Relevant to the Proposed Development

River I.D.	Monitoring Station	Location	Q-Value (WFD Status)
Thomastown Stream	N/A	Adjoining the eastern boundary of the Site	N/A
River Blackwater (Longwood)	Br at Johnstown Station I.D.: RS07B020100	2.13km NE of the Site and 2.32km upstream of the confluence with the Thomastown Stream	3 (Poor) in 2020
River Blackwater (Longwood)	Br at Johnstown Station I.D.: RS07B020100	5.73km NW of the Site and 5.63km downstream of the confluence with the Thomastown Stream	3-4 (Moderate) in 2020

The EPA (EPA, 2022) have published groundwater quality data for the Trim GWB in the vicinity of the Site. The closest operational EPA groundwater monitoring location within the Trim GWB is the Enfield Bore station (Station I.D. GWIE_EA_G_00223000004) located approximately 3.98km northeast of the Site. The EPA data indicates that there is an upward trend in Total Ammonia, Chloride, Nitrate and Ortho-phosphate for the period 2013-2018 (EPA, 2022).

Groundwater and surface water monitoring and sampling was undertaken by Enviroguide Consulting the 13th September 2022. Samples were collected in accordance with Enviroguide Consulting Standard Operating Procedures (SOP) and BS EN ISO 5667 - Water Quality - Sampling.

Samples were collected from one (1No.) onsite groundwater monitoring well (MW1), two (2No.) open waterbodies in the central portion of the site (SW2 and SW4) and one (1No.) standing pool of water identified at the northern edge of the Site (SW1) which are shown in Figure 7-6.

The groundwater and surface water analytical results (refer to Appendix B) were screened against the following assessment criteria:

- S.I. No. 9/2010 - European Communities Environmental Objectives (Groundwater) Regulations 2010 and amendment S.I. No.366/2016 (GW GTVs);
- S.I. No. 272/2009 - European Communities Environmental Objectives (Surface Waters) Regulations 2009 including amendments S.I. No. 327/2012, S.I. No. 386/2015 and S.I. No. 77/2019 (SW AA-EQS and/or MAC EQS); and

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- SI. No. 122/2014 - European Union (Drinking Water) Regulations 2014 including amendments S.I. No. 464/2017 (DW PVs).

The sample results for all groundwater and surface water samples collected were reported as below the applicable GW GTVs, SW EQS and DW PVs with the exception of metals (arsenic) at GW1 which exceeded the applicable DW PV and ammonia at SW1 which exceeded the applicable GW GTV and SW EQS.

The reported concentrations of petroleum hydrocarbons were reported as below the laboratory limits of detection and below the applicable GW GTVs, SW EQS and DW PVs at all sample locations.

7.3.12.1 Hydrochemical Analysis and Groundwater Sources

Samples collected from groundwater monitoring wells (MW1), open waterbodies (SW3 and SW4), standing pools of water (SW1), and from surface water locations (SW6) were analysed for a suite of major ions. The hydrochemical data for major ions were produced graphically for each sample using the Piper diagram which is a graphical representation of the hydrochemistry of a water sample or samples. The Trilinear Piper diagram can show the percentage composition of different ions.

The objective of Piper diagram was to analyse the major ion composition of the samples and determine if the sampled water was from the same source and if there is a correlation between groundwater and surface water at the Site. The hydrochemistry plots generated using the Piper diagrams are provided in Figure 7-9 (refer Appendix B).

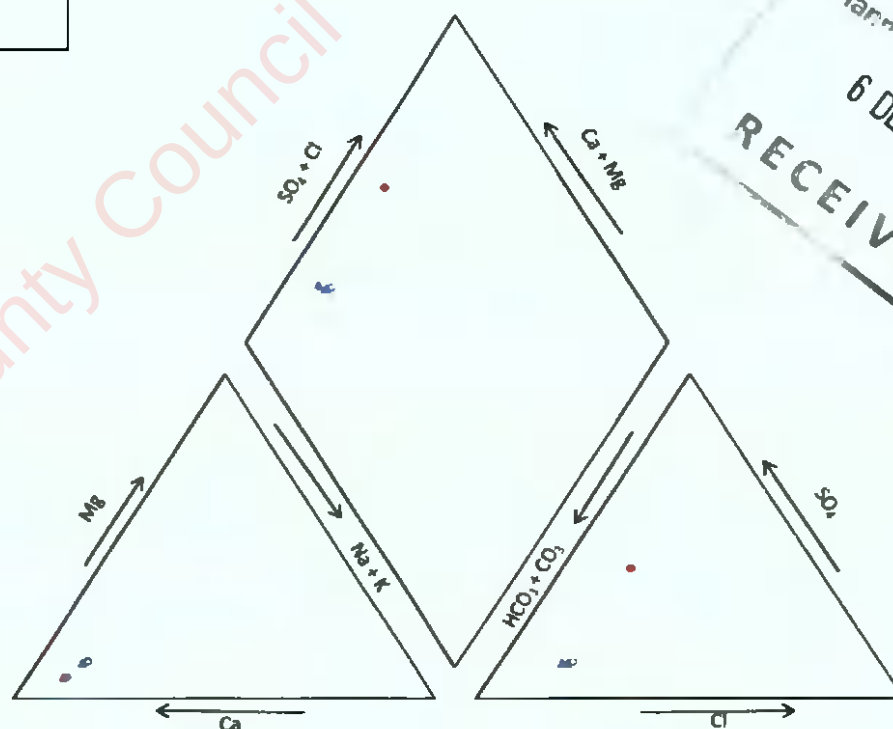
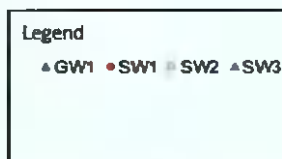


Figure 7-9. Piper Diagram for Groundwater and Surface Water Samples

The Piper Plot results for samples GW1 (groundwater monitoring well), SW2 and SW3 (surface water / open water bodies at the Site) indicate that the samples have a calcium-bicarbonate and indicates that the open water bodies at the site (SW2 and SW3) are groundwater fed. The Piper Plot results for sample SW1 indicate that the sample has a calcium-sulphate signature. The sulphate is indicative of a potential rainwater influence and while there may be some groundwater influence on SW1 it is of a different hydrochemical facies and different water source than SW2 and SW3.

It is noted that the Thomastown Stream was dry at the time of sampling and therefore samples could not be collected for hydrochemical analysis.

7.3.13 Water Framework Directive

The Water Framework Directive status for surface water and groundwater bodies relevant to the Site as recorded by the EPA (EPA, 2022) in accordance with European Communities (Water Policy) Regulations 2003 (S.I. No. 722/2003) are provided in Table 7-8.

The Royal Canal Main Line (Boyne) (EU Code: IE_07_AWB_RCMLE) is located approximately 1.31km north of the Site.



Table 7-8: Water Framework Directive Status

EPA Name	WFD Waterbody Name (EU Code)	Location from Site	Distance from Site	WFD water body status (2013-2018)	Hydraulic Connection to the Site
Surface Water Bodies					
Thomastown Stream	Blackwater (Longwood)_030 (IE_EA_07B020200)	Adjoining the Eastern boundary of the Site	0.0km	Moderate	Yes – Direct connection to via the open drainage channel identified along the eastern boundary of the Site (refer to Section 7.3.4). Potential hydraulic connection via groundwater.
Blackwater (Longwood) River	Blackwater (Longwood)_030 (IE_EA_07B020200)	North	1.54km (downstream)	Moderate	Yes – Downstream of the Thomastown Stream. Potential hydraulic connection via groundwater.
	Blackwater (Longwood)_040 (IE_EA_07B020300)	Northwest	3.31km (downstream)	Moderate	
	Blackwater (Longwood)_050 (IE_EA_07B020300)	Northwest	8.08km (downstream)	Moderate	
River Boyne	Boyne_060 (IE_EA_07B040900)	Northwest	13.65km (downstream)	Good	Yes – Downstream of Blackwater (Longwood) River. Potential hydraulic connection via groundwater.
Royal Canal	Royal Canal Main Line (Boyne) (IE_07_AWB_RC_MLE)	North	1.31km	Good	No
Groundwater Bodies					
Trim GWB	Trim GWB (IE_EA_G_002)	N/A	N/A	Good	Yes - Underlying groundwater-body

7.3.14 Designated and Protected Areas

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and wild fauna and flora by the designation of Special Areas of Conservation (SACs) and the Birds Directive (2009/147/EC) seeks to protect birds of special importance by the designation of Special Protection Areas (SPAs). SACs and SPAs are collectively known as Natura 2000 or European sites (referred to hereafter as Natura 2000 site). National Heritage Areas (NHAs) are designations under the Wildlife Acts to protect habitats, species, or geology of national importance. The boundaries of many of the NHAs in Ireland overlap with SAC and/or SPA sites. Although many NHA designations are not yet fully in force under this legislation (referred to as 'proposed NHAs' or pNHAs), they are offered protection in the meantime under planning

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policy which normally requires that planning authorities give recognition to their ecological value.

The designated and protected sites are described in detail in Chapter 5 of this EIAR. The designated and protected sites located within a 15km radius of the Proposed Development Site are presented in Figure 7-10.

There are five (5No.) sites located within a 15km radius of the Proposed Development site that are identified as Special Areas of Conservation (SACs), one (1No.) site identified as a Special Protection Areas (SPA), three (3No.) sites that are identified as National Heritage Areas (NHAs) and ten (10No.) sites that are identified as proposed National Heritage Areas (pNHAs).

It is noted that there is a potential hydraulic connection via the Blackwater (Longwood) River between the Site and the River Boyne and River Blackwater SAC and SPA located approximately 13.65km downstream of the Site. The Royal Canal Main Line pNHA is not hydraulically connected to the Site via groundwater as canals are designed to be hydraulically isolated from natural water courses and the Blackwater (Longwood) River crosses the canal downstream of the Site via the Blackwater Aquaduct at Enfield.

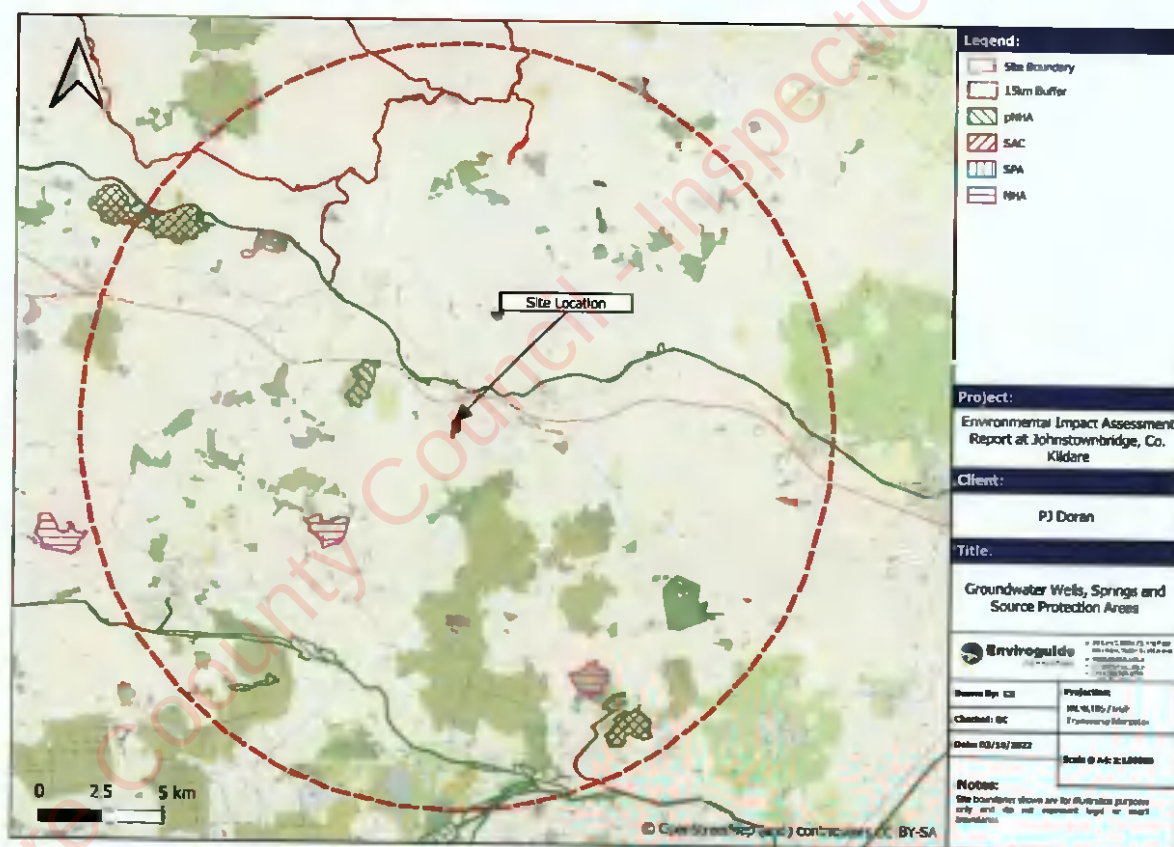


Figure 7-10: Designated and Protected Areas

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7.3.15 Conceptual Site Model

Surface runoff at the Site currently infiltrates to ground and enters the open waterbodies identified in the central portion of the Site and potentially discharges to the Thomastown Stream via over land flow and the open drainage channel identified along the eastern boundary of the Site.

Based on the measured groundwater and surface water elevations, the inferred groundwater flow direction beneath the Site is the north and northeast towards the Thomastown Stream and north towards the Blackwater (Longwood) River. Based on the observed ground conditions, measured groundwater and surface water elevations and hydrochemical data for surface water and groundwater at the Site the Thomastown Stream and the open waterbodies identified in the central portion of the Site are hydraulically connected to groundwater and groundwater fed. However, the standing water identified along the northern and southern edges of the Site (SW1) likely to comprise of collected surface runoff (rainwater) and potentially some groundwater inflow.

The GSI (GSI, 2022) has classified the bedrock of the Lucan Formation beneath the Site and surrounding area as a Locally Important Aquifer (Lm) (i.e., bedrock which is generally moderately productive). The Kilmurry locally important gravel aquifer (Lg) is mapped beneath the eastern boundary of the Site.

The GSI have assigned a groundwater vulnerability rating of 'High (H)' to 'Moderate (M)' for the groundwater beneath the Site. However, given the extent of the existing quarry excavation works it is considered that the actual vulnerability at the Site may be locally 'Extreme (E)'.

Based on the hydrological and hydrogeological setting of the Site, the identified source-pathway-receptor linkages associated with the Site (Source) are considered to be:

- Offsite groundwater migration to downgradient gravel and bedrock aquifers;
- Offsite groundwater migration to downgradient receiving surface water courses including the Thomastown Stream, the Blackwater (Longwood) River and the River Boyne;
- Offsite groundwater users noting that the Johnstown PWS and the Enfield PWS are not hydraulically downgradient of the Site and therefore not considered further in this assessment.

7.3.16 Importance of Receiving Environment

The receiving water bodies have been assigned a WFD Status of 'good' for groundwater, and 'moderate' to 'good' for the closest surface water bodies hydraulically connected to Site. There is no identified risk to designated and protected sites.

Overall, taking account of the receiving hydrogeological environment, in accordance with the criteria set out in in Table 7-1.

Table 7-1 the Site is considered to be of 'medium to high' hydrogeological importance given that the bedrock and gravel aquifers beneath the site are classified as locally important aquifers with a high to extreme vulnerability rating and taking account of the characteristics of the environment including WFD Status.

7.4 Characteristics of the Proposed Development

The Proposed Development is described in Section 7.1.2 and characteristics relevant to this Chapter are described in Section 7.4.1 and Section 7.4.2.

7.4.1 Construction Phase

The Construction Phase for the Proposed Development will comprise the following:

- Preparatory works including the stripping of topsoil and vegetation across the Proposed Development Site will also be completed prior to the acceptance of any material onsite.
- Limited excavation and regrading of soil for the construction of the impermeable inspection and quarantine area, temporary site office and welfare facilities, the weighbridge, and the wheel wash.
- Any excavated soils or materials will be appropriately stockpiled and stored on-site for re-use during the restoration of the Site.
- The site office and welfare facilities that will be installed for both the Construction Phase and the Operational Phase will be prefabricated self-contained units. The welfare facilities will be emptied by an approved contractor as part of a maintenance contract and in accordance with relevant waste management legislation.
- The weighbridge, and wheel wash facilities that will be installed at the Site and will also be prefabricated self-contained units. Water supply for the wheel wash will be via rainwater harvesting and it will be emptied of sediment by vac-tanker as part of a maintenance contract by a suitably licensed waste contractor.
- The Proposed Development will not require any drainage works or drainage infrastructure.

7.4.2 Operational Phase

The Operational Phase of the Proposed Development comprises the importation of material to in-fill and re-contour the Site as summarised below:

- A total of approximately of 85,640m³ (approximately 128,460 tonnes) of greenfield soil and subsoil will be imported to the Site over a 5 year period (refer to Figure 7-11).
- The proposed plant will consist of a tracked bulldozer for placing the soil and compressing it to a level that will permit good drainage. An excavator may be brought on to Site from time to time to construct internal tracks.
- It is proposed to raise the level of the site by approximately 3.0m to come in line with the boundary elevations. This will include the infilling of the three (3No.) open water-bodies located in the central portion of the Site (refer to Figure 7-6).
- Filling operations will be confined to a selected area of the Site at any one time with each area being restored in a timely manner from commencement of the next phase
- An earth bund and silt fence will be constructed around the perimeter of the infill area. The bund will be 11.5m wide and 1.2m high with sides of gradient of 1:2.5. The silt

fence will be 1.2m high above ground with 0.3m buried into firmed ground (posts at 2.0m centres). The silt fence will be constructed ahead of the bund. As portions of the bund are constructed, they will be seeded within one month of construction. The infill area will be completed in 0.6m increments and repeated until the required heights are achieved.

- A 10-meter buffer and silt fence will be maintained along the eastern boundaries of the site where no soil importation will take place to protect surface waters and to ensure that there are no offsite nuisances created by the Site.
- The re-profiling of the surface will be carried out to allow for the planting of native grassland and supervised by a qualified landscape architect to ensure that the filling is carried out in a manner that will derive maximum benefit from this.
- There will be no water abstracted from any surface water course for the Proposed Development.
- Drinking water for the Proposed Development will be from bottled water provided in the site office.





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7.5 Potential Impact of the Proposed Development

7.5.1 Construction Phase

7.5.1.1 Direct

Hydrogeological Regime

There are no significant construction works proposed at the Site as there is an existing access gate and internal roadways. The Proposed Development will not involve any excavation of bedrock. Some limited excavation and regrading of soil will be required for the construction of the impermeable inspection and quarantine area, temporary site office and welfare facilities and the prefabricated weighbridge and wheel washing facilities. There will be no construction of drainage. Therefore, there will be no impact on the hydrological and hydrogeological environment during the Construction Phase of the Proposed Development.

Water Quality

There will be no storage or handling of deleterious materials such as lubricants, oils etc. and any refuelling will be controlled to minimise the potential for release to ground. There may also be the requirement for use of portable generators or similar fuel containing equipment during the construction phase of the Proposed Development, which will be placed on suitable drip trays. In the absence of standard and appropriate construction management and mitigation measures, if the accidental release of hazardous material including fuels and oils being used onsite, through the failure of secondary containment or a materials handling accident, were to occur over open ground then these materials could infiltrate to the underlying groundwater. In the event of such scenarios, it is considered that this could result in 'negative', 'significant' and 'medium-term' impact on a local area of the underlying aquifer environment and the receiving Thomastown Stream depending on the nature of the incident. Appropriate controls will be in place to prevent this unlikely scenario.

7.5.1.2 Indirect

There are no indirect impacts associated with the Construction Phase of the Proposed Development.

7.5.1.3 Secondary

There are no secondary impacts associated with the Construction Phase of the Proposed Development.

7.5.2 Operational Phase

7.5.2.1 Direct

Hydrogeological Regime

There will be no abstraction of groundwater at the Site during the Operational Phase of the Proposed Development as water will be derived from bottled water for drinking water and from rainwater harvesting for wheel washing facilities.

There will be no direct discharges to ground as part of the Operational Phase of the Proposed Development.

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The infilling of the Site will greenfield soil and stone which will have a lower hydraulic conductivity than the native sand and gravel in the surrounding areas, will reduce existing downwards infiltration rate beneath the Site within the localised portion of the 669km² Trim GWB. It is noted that while there may be a reduction in infiltration to ground and local variations in the mechanism for groundwater recharge the overall regional groundwater flow regime within the Trim GWB will not be altered.

The infilling of the of open waterbodies identified in the central portion of the Site will potentially impede shallow groundwater flow through the gravel aquifer in that very localised upper portion of the saturated zone of the aquifer. However, the surrounding sand and gravel will provide preferential flow paths for groundwater movement across the Site the overall regional groundwater flow regime will not be altered. There is no identified risk of groundwater flooding at the Site or offsite based on the hydrogeological conditions at the Site including groundwater levels, flow regime and proposed final site topography.

Overall, it is considered that any impact on the hydrogeological regime of the locally important aquifer is unavoidable however there will be 'negative', 'slight' and 'permanent' impact within a very localised zone of the aquifer and Trim GWB.

Hydrological Regime

There will be no discharges to or abstractions from any surface water course as part of the Operational Phase of the Proposed Development.

The surface cover will be changed from sand and gravel at ground surface to a lower permeability soil however, this is likely similar to pre-quarrying soil cover. Therefore, there may be the potential to reduce infiltration to soil and increase surface runoff. However, the design of the Proposed Development will be in accordance with the requirements of applicable EPA restoration guidelines (EPA Landfill Design Manuals, 1999 and 2000) to ensure there is no impact on the local surface water flow regime. Furthermore, the Proposed Development is that the land will be restored and planted with native grassland, thereby restoring runoff rates to greenfield surface runoff. Accordingly, it is considered that there will be no increased flood risk or changes to local surface water flow regimes and there will be a 'neutral', 'imperceptible', 'long-term' impact on the local surface water flow regime.

Groundwater Vulnerability

The groundwater vulnerability at the Site is mapped by the GSI (GSI, 2021) as high (H). However, given that much of the soil and subsoil has been removed and given the presence of open waterbodies which were excavated during historic quarrying activities at the Site, the groundwater vulnerability across the Site is considered to be 'Extreme (E)'. The Operational Phase of the Proposed Development will include the importation of 85,640.342m³ (approximately 128,460.5 tonnes) of greenfield soil and stone which will potentially have a lower hydraulic conductivity than the native sand and gravel in the surrounding areas, thus increasing the overall thickness of overburden above the aquifer and reducing the groundwater vulnerability across the Site. Therefore, there will be an overall 'positive', 'moderate' and 'permanent' impact on the groundwater vulnerability across the Site reducing the potential for migration of contamination to groundwater.

Water Quality



There will be no direct discharges to groundwater or surface water during the Operational Phase of the Proposed Development.

The importation of any required material for restoration purposes will be subject to strict control procedures that will include testing for contaminants, invasive species and other anthropogenic inclusions and will be required to be geochemically suitable in accordance with EPA guidelines for soil recovery facilities (EPA, 2020). Therefore, there will be no potential impacts on the quality of the receiving water environment associated with the imported soils.

A small open drainage channel was identified, during the site walkover, along the eastern boundary of the Site (refer to Figure 7-3). This open drainage channel was observed to discharge to the Thomastown Stream located along the eastern boundary of the Site. Infilling activities during the Operational Phase of the Proposed Development have the potential to release sediment. However, a buffer of a minimum of 10m will be maintained between the proposed infill areas and the Site boundary where no works will take place to protect surface waters. In addition, an earth bund and silt fence will be constructed around the perimeter of the infill area. There will be no impact associated with infilling activities on water quality within the surface water courses. Therefore, it is considered that there will be no significant impact on the quality of the receiving Thomastown Stream or any other surface water receptor associated with the Site.

There will be no storage or handling of deleterious materials such as lubricants, oils etc. and any refuelling will be controlled to minimise the potential for release to ground. In the event of an unlikely scenario, if the accidental release of hazardous material (i.e., fuels and oils being used onsite), through the failure of secondary containment or a materials handling accident, were to occur over open ground then these materials could infiltrate to the underlying groundwater and there would be a 'negative', 'significant' and 'medium-term' impact on a local area of the underlying aquifer environment and the receiving Thomastown Stream depending on the nature of the incident. Appropriate controls will be in place to prevent this unlikely scenario (refer to Section 7.4).

Once the importation is complete the Applicant will commence planting the Site with native grasslands, thus improving the quality surface water runoff through the reduction and control of siltation of any runoff from the Site. It is considered that there will be 'positive', 'slight' and 'long-term' impact to the receiving surface water quality.

7.5.2.2 Indirect

There are no indirect impacts associated with the Operational Phase of the Proposed Development.

7.5.2.3 Secondary

There are no secondary impacts associated with the Operational Phase of the Proposed Development.

7.5.3 Potential Cumulative Impacts

There are no cumulative impacts associated with the Operational Phase of the Proposed Development.

7.5.4 "Do Nothing" Impact

In the 'Do Nothing' scenario it is considered that the Proposed Development did not proceed and the potential impact on the receiving hydrological and hydrogeological environment is considered.

In the 'Do Nothing' scenario the waste materials identified during the site walkover will remain at the Site and the potential unacceptable risk to the receiving surface water environment remains. The potential positive impact on the groundwater vulnerability across the Site would also not occur.

7.5.5 Water Framework Directive

In the absence of any mitigation or avoidance measures, if the accidental release of hazardous material including fuels and oils being used onsite during the Construction and Operational Phases of the Proposed Development were to occur, there could be a potential impact on the water quality within receiving water bodies associated with the Site, specifically within a local zone of the Trim GWB. There would be a potential 'negative', 'significant' and 'medium-term' impact to GWB status within a local portion of the Trim GWB.

In the unmitigated worst-case source scenario at the site, and in the absence of design and mitigation measures there could be a potential 'negative', 'significant' and 'short term' impact, on the receiving WFD Status of the Thornastown Stream (EPA name) and potentially within the Blackwater (Longwood) River locally within the vicinity of the point of discharge to the Blackwater (Longwood) River, associated with surface water discharges from the Site. Taking account of the nature of the incident and the potential for assimilation within the receiving water bodies, it is considered that there would be no impact to the receiving WFD Status within the River Boyne.

7.6 Avoidance, Remedial & Mitigation Measures

The measures outlined in this section of the report will ensure that there will be no significant impact on the receiving groundwater and surface water environment and associated receptors (e.g., Natura 2000 sites). Therefore, the Proposed Development will not have any impact on compliance with the EU Water Framework Directive, European Communities (Environmental Objectives) Surface Water Regulations (S.I. 272 of 2009 and as amended) and the European Communities Environmental Objectives (Groundwater) Regulations (S.I. No. 9 of 2010 and as amended) individually or in combination.

7.6.1 Construction Phase

There are no significant construction works proposed at the Site with limited excavation and regrading of soil required. The site office and welfare facilities, and the weighbridge and wheel washing facilities will be prefabricated and delivered to Site.

There will be no storage or handling of deleterious materials such as lubricants, oils etc. and any refuelling will be controlled to minimise the potential for release to ground.

Refuelling of plant and vehicles during the Construction Phase will only be permitted at the designated impermeable refuelling station onsite and will be from a road tanker brought to site as required. The refuelling station will be fully contained and equipped for spill response. A

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procedure will be drawn in advance of works commencing which will be adhered to during refuelling of on-site vehicles. This will include the following:

- Fuel will be delivered to plant on-site by dedicated tanker;
- All deliveries to on-site vehicles will be supervised and records will be kept of delivery dates and volumes;
- The driver will be issued with, and will carry at all times, absorbent sheets and granules to collect any spillages that may accidentally occur;
- Where the nozzle of a fuel pump cannot be placed into the tank of a machine then a funnel will be used; and
- All re-fuelling will take place in a designated impermeable area. In addition, oil absorbent materials will be kept on-site in close proximity to the re-fuelling area.

Emergency procedures will be developed by the appointed Contractor in advance of works commencing and spillage kits will be available on-site including in vehicles operating on-site. Construction staff will be familiar with emergency procedures for in the event of accidental fuel spillages. Remedial action will be immediately implemented to address any potential impacts in accordance with industry standards and legislative requirements.

The welfare facilities, that will include a self-contained chemical toilet will be emptied by an approved contractor as part of a maintenance contract and in accordance with relevant waste management legislation.

7.6.2 Operational Phase

Once planning is obtained, it is intended to apply to KCC for a Waste Facility Permit. Subject to grant of permission, only clean soil and subsoil from greenfield development sites will be accepted in accordance with the conditions of the permit. The only EWC code accepted on site will be 17 05 04 - Soil and Stones other than those mentioned in 17 05 03*.

An Environmental Management System (EMS) will be developed for the Proposed Development and control and mitigation requirements will be strictly implemented for the duration of the Operational Phase to mitigate any potential impact on the receiving hydrological and hydrogeological environment. As part of the EMS a register of incoming materials for the site will be maintained at all times.

Mitigation measures will be adopted as part of the construction works on the Proposed Development site. These measures are considered to be best practice construction techniques that are applicable to most developments of this scale and nature. The measures will address the main activities of potential impact which include:

- Control and Management of Water and Surface Runoff;
- Management and control of imported soil and aggregates from off-site sources;
- Fuel and Chemical handling, transport, and storage; and
- Accidental release of contaminants – notify relevant statutory authorities.

As part of the overall construction methodology, sediment and water pollution control risks arising from construction-related surface water discharges will be considered. All works carried out as part of these infrastructure works will comply with all Statutory Legislation including the

Local Government (Water Pollution) acts, 1977 and 1990 and the contractor will cooperate fully with the Environment Section of Kildare County Council in this regard.

Import of Soil and Stone

Quality control procedures will be in place to check and verify all materials imported for to the Site are acceptable. The importation of greenfield or equivalent as per EPA guidelines (EPA, 2020) soil and stone will be subject to control procedures which will include testing for contaminants, invasive species and other anthropogenic inclusions. Contract and procurement procedures will ensure that all fill material imported to the Site are coming from a known source which has previously been inspected at the source location and approved for transport to the Proposed Development site. Any and all materials imported to the Site for recovery will be inspected on delivery and prior to unloading / placement on the Site. Any unsuitable materials will be removed from the Site in accordance with all legislative requirements.

Management and Protection of Water

The management and storage of greenfield soil and stone imported to the Site will be carried out in accordance with the pollution prevention controls/ mitigation measures in the EMS that will be developed for the Operational Phase of the Proposed Development.

Imported soils will be sealed to prevent run-off of rainwater /or the generation of dust.

Discharges to the Thomastown Stream will not be permitted. A 10-meter buffer and silt fence will be maintained along the eastern boundaries of the Site where no soil importation will take place to protect surface waters and to ensure that there are no offsite nuisances created by the Site.

An earth bund and silt fence will be constructed around the perimeter of the infill area. The earth bund and silt fencing will act as temporary sediment control devices to protect receiving watercourses from sediment and potential surface water run-off from the Site. The fencing will be inspected twice daily based on Site and weather conditions for any signs of contamination or excessive silt deposits and records of these checks will be maintained.

All trucks leaving the site will pass through a wheel wash and therefore removing the potential for transport of sediment off-site. The wheel wash will be periodically cleaned out and its contents will be disposed of in the appropriate manner by a suitably licensed waste contractor and never discharged onsite.

The welfare facilities, that will include a self-contained chemical toilet will be emptied by an approved contractor as part of a maintenance contract and in accordance with relevant waste management legislation.

Infilling of Open Waterbodies

The infilling of the existing open waterbodies onsite will be undertaken with cognisance to Construction Industry Research and Information Association (CIRIA), 2006. 'Control of Water Pollution from Linear Construction Projects: Technical guidance' (CIRIA C649) and 'Control of water pollution from construction sites. Guidance for consultants and contractors (C532)' and the following mitigation measures will be strictly adhered to:

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- In advance of restoration works, the open waterbodies should be infilled to a depth of 1m with clean native gravel to act as a filter medium prior to infilling with soil and stone;
- The infilling of the open water bodies will be undertaken in advance of restoration works across remaining areas of the Site;
- All works will be executed so as to minimise the re-suspension of solids;
- Any machines working in the vicinity of the open waterbodies will be protected against leakage or spillage of fuels, oils, greases and hydraulic fluids;
- Any displaced water during the infilling of the open waterbodies will be allowed to infiltrate to ground in the immediate surrounding area. Where required, drainage runoff controls such as settlement tanks, silt fences and silt traps will be temporarily provided. Displaced water will not be permitted to enter the Thomastown Stream.

Restoration

The restoration of the Site will take into consideration the surround landscape, the local groundwater flow regime and proposed use of the lands for agriculture (i.e., grazing of animals) and will be undertaken in accordance with the requirements of applicable EPA restoration guidelines (EPA Landfill Design Manuals, 1999 and 2000). Where required, the appropriate drainage layers will be incorporated into the soil cover to minimise potential issues for slope stability associated with pore water.

Accordingly, any potential impact on receiving surface water and groundwater beneath the Proposed Development Site will be avoided taking account of the design and mitigation proposals. Therefore, it is considered that the water quality protection criteria and objectives of the GDSDS and Water Framework Directive will be achieved.

There is no other requirement for mitigation measures for the Operational Phase of the Proposed Development.

Handling of Fuels and hazardous Materials

There will be no storage or handling of deleterious materials such as lubricants, oils etc. and any refuelling will be controlled to minimise the potential for release to ground.

Refuelling of plant and vehicles during the Construction Phase will only be permitted at the designated impermeable refuelling station onsite and will be from a road tanker brought to site as required. The refuelling station will be fully contained and equipped for spill response. A procedure will be drawn in advance of works commencing which will be adhered to during refuelling of on-site vehicles. This will include the following:

- Fuel will be delivered to plant on-site by dedicated tanker;
- All deliveries to on-site vehicles will be supervised and records will be kept of delivery dates and volumes;
- The driver will be issued with, and will carry at all times, absorbent sheets and granules to collect any spillages that may accidentally occur;
- Where the nozzle of a fuel pump cannot be placed into the tank of a machine then a funnel will be used; and
- All re-fuelling will take place in a designated impermeable area. In addition, oil absorbent materials will be kept on-site in close proximity to the re-fuelling area.

Emergency procedures developed in accordance the EMS will be strictly implemented during the Operational Phase of the Proposed Development and spillage kits will be available on-site including in vehicles operating on-site. All staff will be familiar with emergency procedures for in the event of accidental fuel spillages

In the event of a leak or spill from equipment (e.g., leak or spill from machinery during restoration works), any contaminated soil will be removed from the Site and compliantly disposed off-site. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and EPA guidelines.

7.6.3 "Worst Case" Scenario

During the Construction Phase and Operational Phase of the Proposed Development, in a worst-case scenario, such as a fuel spill or accidental unmitigated release of other hazardous compounds occurring, and in the absence of any mitigation measures it is considered that there would be a potential 'negative', 'significant', 'medium term' impact on the quality of a localised zone of the aquifer and potentially the receiving Thomastown Stream and within the Blackwater (Longwood) River locally within the vicinity of the point of discharge to the Blackwater (Longwood) River. However, this worst-case scenario is deemed to be unlikely scenario taking account of the embedded design avoidance measures and mitigation measures.

7.7 Residual Impacts

Residual Impacts are defined as 'effects that are predicted to remain after all assessments and mitigation measures. They are the remaining 'environmental costs' of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts.

The predicted impacts of the Construction and Operational Phases are described in Table 7-9 in terms of quality, significance, extent, likelihood, and duration. The relevant mitigation measures are detailed, and the residual impacts are determined which take account of the avoidance, remedial and mitigation measures.

There will be no significant adverse residual impacts on the receiving hydrological and hydrogeological environment associated with the Proposed Development.

The restoration of the existing quarry will have an overall 'positive', 'slight', and 'permanent' impact on the vulnerability of the underlying groundwater environment.

There will be no impact to the existing WFD Status of water bodies associated with the Proposed Development including the Thomastown Stream, the Blackwater (Longwood) River, the River Boyne and the Trim GWB as a result of the Proposed Development taking account of design avoidance and mitigation measures where required.



Table 7-9: Summary of Residual Impacts

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Construction Phase								
Accidental release of deleterious materials including fuel and other materials being used on-site.	Water quality / WFD Status	Potential for impact on Trim GWB within a localised zone of the aquifer and on the receiving Blackwater (Longwood) River. It is deemed unlikely to impact on the receiving River Boyne.	Negative	Significant	Medium Term	Direct / Worst Case	Appropriate mitigation measures to prevent the worst-case scenario occurring will be implemented during the Construction Phase.	Imperceptible
Operational Phase								
Infilling with reduced permeability soils	Hydrogeological Regime	Infilling of the Site with soil and stone that has a lower hydraulic conductivity and infiltration rate than the native sand and gravel has the potential for localised variations in recharge potential, groundwater resource and flow regime associated with infilling the Site.	Negative	Slight	Permanent	Direct	The restoration of the Site will take account of the local groundwater flow regime and will be in accordance with the requirements of applicable EPA restoration guidelines (EPA Landfill Design Manuals, 1999 and 2000).	Slight
Infilling with reduced permeability soils	Flood Risk	Infilling of the Site with soil and stone that has a lower hydraulic conductivity and infiltration rate than the native sand and gravel may give rise to increased surface water runoff.	Neutral	Imperceptible	Long Term	Direct	The design of the Proposed Development is that the land will be restored and planted with native grassland, thereby reducing surface runoff potential.	Imperceptible

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Infilling with reduced permeability soils	Groundwater Vulnerability	Infilling of the Sita with soil and stone that has a lower hydraulic conductivity and infiltration rate than the native sand and gravel will increase the overall thickness of overburden above the aquifer, thereby reducing the groundwater vulnerability across the Site.	Positive	Moderate	Permanent	Direct	None Required.	Positive
Accidental release of deleterious materials including fuel and other materials being used on-site.	Water quality / WFD Status	Potential for impact on Trim GWB within a localised zone of the aquifer and on the receiving Blackwater (Longwood) River. It is deemed unlikely to impact on the receiving River Boyne.	Negative	Significant	Medium Term	Direct / Worst Case	There will be no storage of deleterious materials and refuelling of plant will be undertaken in accordance with the EMS that will be developed for the Proposed Development. Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants.	Imperceptible
Sita Restoration	Water quality	The planting of the Sita with native grassland will have a positive impact on the quality of surface water runoff through the reduction and control of siltation of any runoff from the Site	Positive	Slight	Long Term	Direct	None Required.	Positive

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7.8 Monitoring

7.8.1 Construction Phase

There are no monitoring requirements specifically in relation to hydrology and hydrogeology during the Construction Phase of the Proposed Development.

7.8.2 Operational Phase

The Proposed Development will be subject to a Waste Facility Permit from KCC. The operator will comply with monitoring requirements as per the conditions of the waste facility permit.

Monitoring of imported soil and stone for restoration materials will be undertaken in accordance with the waste acceptance criteria and procedures set out in the waste facility permit to ensure that only clean inert materials free of contaminants, invasive species and other anthropogenic inclusions is infilled at the site to ensure that there are no potential contaminant sources at Site.

A monitoring programme for groundwater monitoring will be implemented for the Proposed Development. The groundwater quality monitoring programme will ensure that the implemented mitigation and restoration measures are effective in controlling emissions and that there is no negative impact on the receiving water (hydrogeological) environment.

Groundwater samples will be analysed for the following parameters to ensure compliance with the European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010), as amended 2012 (SI 149 of 2012) and 2016 (S.I. No. 366 of 2016):

- pH, electrical conductivity, temperature, dissolved oxygen, ammoniacal nitrogen, total petroleum hydrocarbons (TPH), heavy metals.

It is proposed that groundwater monitoring is undertaken annually. However, the monitoring programme and sampling frequency will be agreed with KCC.

7.9 Interactions

7.9.1 Population and Human Health

Appropriate industry standard and health and safety legislative requirements will be implemented during the construction and operational phases of the Proposed Development that will be protective of Site workers.

Monitoring of groundwater will ensure that there are no associated human health issues. However, there are no anticipated impacts to groundwater, surface water and nearby potable water supply sources associated with the Proposed Development.

It is noted that specific issues relating to Public Health associated with the Proposed Development are set out in Chapter 4 of this EIAR.

7.9.2 Land, Soil, Geology and Hydrogeology

An assessment of the potential impact of the Proposed Development on the existing land, soils and geological environment are set out in Chapter 6 Land, Soil and Geology.

7.9.3 Biodiversity

An assessment of the potential impacts of the Proposed Development on the Biodiversity of the Site, with emphasis on habitats, flora and fauna which may be impacted as a result of the Proposed Development are included in Chapter 5 of this EIAR. It also provides an assessment of the impacts of the Proposed Development on habitats and species, particularly those protected by national and international legislation or considered to be of particular conservation importance and proposes measures for the mitigation of these impacts.

7.10 Difficulties Encountered When Compiling

There were no difficulties encountered when compiling the Hydrology and Hydrogeology Chapter of this EIAR.

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8 AIR QUALITY AND CLIMATE

8.1 Introduction

This Chapter will describe and assess the potential impacts on air quality and climate associated with the proposed importation of material to infill and re-counter the site in the Townland of Thomastown in the Barony of Carbury, in the Electoral Division of Cadamstown, Co. Kildare. The Applicant proposes, subject to the grant of permission, to import clean greenfield soil and stone to remediate approximately 3.689ha of the total site.

Taking into account Ambient Air Quality Standards, the baseline air quality of the proposed facility will be examined along with the potential impacts of the Proposed Development on the existing environment. This Chapter will also describe and assess the potential impacts on micro and macro-climate as a result of the Proposed Development; attention will be focused on Ireland's obligations under the Kyoto Protocol in the context of the overall climatic impact of the presence and absence of the Proposed Development.

8.1.1 Quality Assurance and Competence

This Chapter was prepared by Laura Griffin (BA Hons English and Geography, MSc Climate Change), Environmental Consultants, Enviroguide Consulting. Laura has experience working on a number of EIARs and EIA Screening Reports for projects of a similar scale to the Proposed Development.

8.1.2 Ambient Air Quality Standards

For the protection of health and ecosystems, EU directives apply air quality standards in Ireland and other EU member states for a range of pollutants. These rules include requirements for monitoring, assessment and management of ambient air quality. The first major instrument in tackling air pollution was the Air Quality Framework Directive 96/62/EC and its four daughter Directives. Each of these instruments was repealed with the introduction of Directive 2008/50/EC on ambient air quality and cleaner air for Europe in 2008 (as amended by Decision 2011/850/EU and Directive 2015/1480/EC) (the CAFE Directive), save for the "Fourth Daughter Directive" (Directive 2004/107/EC relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air).

The CAFE Directive lays down measures aimed at:

- 1) defining and establishing objectives for ambient air quality designed to avoid, prevent or reduce harmful effects on human health and the environment as a whole;
- 2) assessing the ambient air quality in Member States on the basis of common methods and criteria and, in particular, assessing concentrations in ambient air of certain pollutants;
- 3) providing information on ambient air quality in order to help combat pollution and nuisance and to monitor long-term trends and improvements resulting from national and Community measures;
- 4) ensuring that such information on ambient air quality is made available to the public;
- 5) maintaining air quality where it is good and improve it in other cases;
- 6) promoting increased cooperation between the Member States in reducing air pollution.

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Ambient air quality monitoring and assessment in Ireland is carried out in accordance with the requirements of the CAFE Directive. The CAFE Directive has been transposed into Irish legislation by the Air Quality Standards Regulations (S.I. No. 180 of 2011). The CAFE Directive requires EU member states to designate 'Zones' reflective of population density for the purpose of managing air quality. Four zones were defined in the Air Quality Standards Regulations (2011) and subsequently amended in 2013 to account for 2011 census population counts and to align with coal restricted areas in the Air Pollution Act (Marketing, Sale, Distribution and Burning of Specified Fuels) Regulations 2012. (S.I. No. 326 of 2012) (the 2012 Regulations).

The main areas defined in each zone are:

- ❖ **Zone A:** Dublin Conurbation
- ❖ **Zone B:** Cork Conurbation
- ❖ **Zone C:** Other cities and large towns comprising Limerick, Galway, Waterford, Drogheda, Dundalk, Bray, Navan, Ennis, Tralee, Kilkenny, Carlow, Naas, Sligo, Newbridge, Mullingar, Wexford, Letterkenny, Athlone, Celbridge, Clonmel, Balbriggan, Greystones, Leixlip and Portlaoise.
- ❖ **Zone D:** Rural Ireland, i.e., the remainder of the State excluding Zones A, B and C.

The site of the Proposed Development is located in Thomastown, Johnstownbridge, Co. Kildare and falls under the 'Zone D' category based on the EPA CAFE Directive.

The CAFE Directive outlines certain limit or target values specified by the five published directives that apply limits to specific air pollutants. These limits, outlined in Table 8-1, will be referred to as part of the Proposed Development assessment with respect to air quality.



Table 8-1: Limit Values of Cleaner Air for Europe (CAFE) Directive 2008/50/EC (Source: EPA, 2020)

Pollutant	Limit Value Objective	Averaging Period	Limit Value $\mu\text{g}/\text{m}^3$	Limit Value ppb	Basis of Application of the Limit Value	Limit Value Attainment Date
SO ₂	Protection of Human Health	1 hour	350	132	Not to be exceeded more than 24 times in a calendar year	1 Jan 2005
SO ₂		24 hours	125	47	Not to be exceeded more than 3 times in a calendar year	1 Jan 2005
SO ₂	Protection of vegetation	Calendar year	20	7.5	Annual mean	19 July 2001
SO ₂		1 Oct to 31 Mar	20	7.5	Winter mean	19 July 2001
NO ₂	Protection of human health	1 hour	200	105	Not to be exceeded more than 18 times in a calendar year	1 Jan 2010
NO ₂		Calendar year	40	21	Annual mean	1 Jan 2010
NO + NO ₂	Protection of ecosystems	Calendar year	30	16	Annual mean	19 July 2001
PM ₁₀	Protection of human health	24 hours	50	-	Not to be exceeded more than 35 times in a calendar year	1 Jan 2005
PM ₁₀		Calendar year	40	-	Annual mean	1 Jan 2005
PM _{2.5} - Stage 1		Calendar year	25	-	Annual mean	1 Jan 2015
PM _{2.5} - Stage 2		Calendar year	20	-	Annual mean	1 Jan 2020
Lead		Calendar year	0.5	-	Annual mean	1 Jan 2005
Carbon Monoxide		8 hours	10,000	8,620	Not to be exceeded	1 Jan 2005
Benzene		Calendar year	5	1.5	Annual mean	1 Jan 2010

The EPA is the competent authority for the purpose of the CAFE Directive and is required to send an annual report to the Minister for Environment and the European Commission. The regulations further provide for the distribution of public information. This includes information on any exceedances of target values, the reasons for exceedances, the area(s) in which they occurred, and the relevant information regarding effects on human health and environmental impacts.

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8.1.3 Climate Agreements

Climate change is recognised as one of the most serious global environmental problems and arguably the greatest challenge facing humanity today. While natural variations in climate over time are normal, anthropogenic activities have interfered greatly with the global atmospheric system by emitting substantial amounts of greenhouse gases (GHGs). This has caused a discernible effect on our global climate system, with continued change expected due to current and predicted trends of GHG emissions. In Ireland this is demonstrated by rising sea levels, changes in the ecosystem, and extreme weather events.

In March 1994, the United Nations Framework Convention on Climate Change (UNFCCC) was established as an intergovernmental effort to tackle the challenges posed by climate change. The Convention membership is almost universal, with 197 countries having ratified. Under the Convention, governments gather and share information on GHG emissions, national policies, and best practices. This information is then utilised to launch national strategies and international agreements to address GHG emissions. Following the formation of the UNFCCC, two major international climate change agreements were adopted: The Kyoto Protocol, and the Paris Agreement.

In April 1994, Ireland ratified the United Nations Framework Convention on Climate Change (UNFCCC) and subsequently signed the Kyoto Protocol in 1997. The Kyoto Protocol is an international agreement linked to the UNFCCC which commits its parties to legally binding emission reduction targets. In order to ensure compliance with the protocol, the Intergovernmental Panel on Climate Change (IPCC) has outlined detailed guidelines on compiling National Greenhouse Gas Inventories. These are designed to estimate and report on national inventories of anthropogenic GHG emissions and removals. Under Article 4 of the Kyoto Protocol, Ireland agreed to limit the net anthropogenic growth of the six named GHGs to 13% above the 1990 level, during the period 2008 to 2012.

The second commitment period of the Kyoto Protocol was established by the Doha amendment which was adopted *in extremis* on the 8th of December 2012, to impose quantified emission limitation and reduction commitments (QELRCs) to Annex I (developed country) Parties during a commitment period from 2013 to 2020. 38 developed countries, inclusive of the EU and its 28 member states, are participating. Under the Doha amendment, participating countries have committed to an 18% reduction in emissions from 1990 levels. The EU has committed to reducing emissions in this period to 20% below 1990 levels. Ireland's QELRCs for the period 2013 to 2020 is 80% of its base year emissions. Ireland's compliance with the Doha amendment will be assessed based on the GHG inventory submission in 2022 for 1990-2020 data. As of October 2020, the Doha Amendment has received the required number of ratifications to enter into force. Once in force, the emission reduction commitments of participating developed countries and economies in transition (EITs) become legally binding.

In December 2015, the Paris Climate Change Conference (COP21) took place and was an important milestone in terms of international climate change agreements. The Paris Agreement sets out a global action plan to put the world on track to mitigate dangerous climate change by setting a global warming limit not to exceed 2°C above pre-industrial levels, with efforts to limit this to 1.5°C. As a contribution to the objectives of the agreement, countries have submitted comprehensive national climate action plans (nationally determined

contributions, NDCs). Under this agreement, governments agreed to come together every 5 years to assess the collective progress towards the long-term goals and inform Parties in updating and enhancing their nationally determined contributions. Ireland will contribute to the Agreement through the NDC tabled by the EU on behalf of Member States in 2020, which commits to a 55% reduction in EU-wide emissions by 2030 compared to 1990. This is considered to be the current NDC maintained by the EU and its Member States under Article 4 of the Paris Agreement.

The EU has set itself targets for reducing its GHG emissions progressively up to 2050, these are outlined in the 2020 climate and energy package and the 2030 climate and energy policy framework. These targets are defined to assist the EU in transitioning to a low-carbon economy, as detailed in the 2050 low carbon roadmap. The 2020 package is a set of binding legislation to ensure that the EU meets its climate and energy targets for the year 2020. There are three key targets outlined in the package which were set by the EU in 2007 and enacted in legislation in 2009:

- 20% reduction in GHG emissions from 1990 levels;
- 20% of EU energy to be from renewable sources;
- 20% improvement in energy efficiency.

The 2030 climate and energy framework builds on the 2020 climate energy package and was adopted by EU leaders in October 2014. The framework sets three key targets for the year 2030:

- At least 40% cuts in GHG emissions from 1990 levels;
- At least 32% share for renewable energy;
- At least 32.5% improvement in energy efficiency.

The EU has acted in several areas in order to meet these targets, including the introduction of the Emissions Trading System (ETS). The ETS is the key tool used by the EU in cutting GHG emissions from large-scale facilities in the power, industrial, and aviation sectors. Around 45% of the EU's GHG emissions are covered by the ETS.

As part of the European Green Deal, the Commission proposed in September 2020 to raise the 2030 greenhouse gas emission reduction target, including emissions and removals, to at least 55% compared to 1990. The European Climate Law came into force in July 2021 and writes into law the goal set out in the European Green Deal for Europe's economy and society to become climate-neutral by 2050. The law also sets the intermediate target of reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels.

8.1.3.1 National Policy Position in Ireland

National climate policy in Ireland recognises the threat of climate change to humanity and supports mobilisation of a comprehensive international response to climate change, and global transition to a low-carbon future.

The Climate Action and Low Carbon Development (Amendment) Act 2021 was enacted in 2021 and sets Ireland on a legally binding path to net-Zero emissions no later than 2050, and to a 51% reduction in emissions by the end of this decade. The Act provides the framework for Ireland to meet its international and EU climate commitments and to become a leader in addressing climate change.

The Irish Government published its Climate Action Plan (2021) and the accompanying Annex of Actions which provides a detailed plan for taking decisive action to achieve a 51% reduction in overall greenhouse gas emissions by 2030. The plan lists actions needed to deliver on our climate targets (and had set indicative ranges of emissions reductions for each sector of the economy, before the Sectoral Emissions Ceilings had been finalised). It will be updated annually to ensure alignment with Ireland's legally binding economy-wide Carbon Budgets and Sectoral Emissions Ceilings. The next Climate Action Plan is due to be published by the end of 2022.

Ireland's latest greenhouse gas (GHG) emissions 1990-2021 are provisional figures based on the SEAI's final energy balance released in June 2022 (EPA, 2022). In 2021, Ireland's GHG emissions are estimated to be 61.53 million tonnes carbon dioxide equivalent (Mt CO₂eq), which is 4.7% higher (or 2.76 Mt CO₂eq) than emissions in 2020 (58.77 Mt CO₂eq). There was a decrease of 3.4% in emissions reported for 2020 compared to 2019. Emissions are over 1% higher than pre-pandemic 2019 figures.

In 2021, national total emissions excluding Land Use, Land Use Change and Forestry (LULUCF) increased by 4.7%, emissions in the stationary ETS sector increased by 15.2% and emissions under the ESR (Effort Sharing Regulation) increased by 1.6%. When LULUCF is included, total national emissions increased by 5.5%. The energy industries, transport and agriculture sectors accounted for 71.9% of total GHG emissions. Agriculture is the single largest contributor to the overall emissions, at 37.5%. Transport, energy industries and the residential sector are the next largest contributors, at 17.7%, 16.7% and 11.4%, respectively (EPA, 2022).

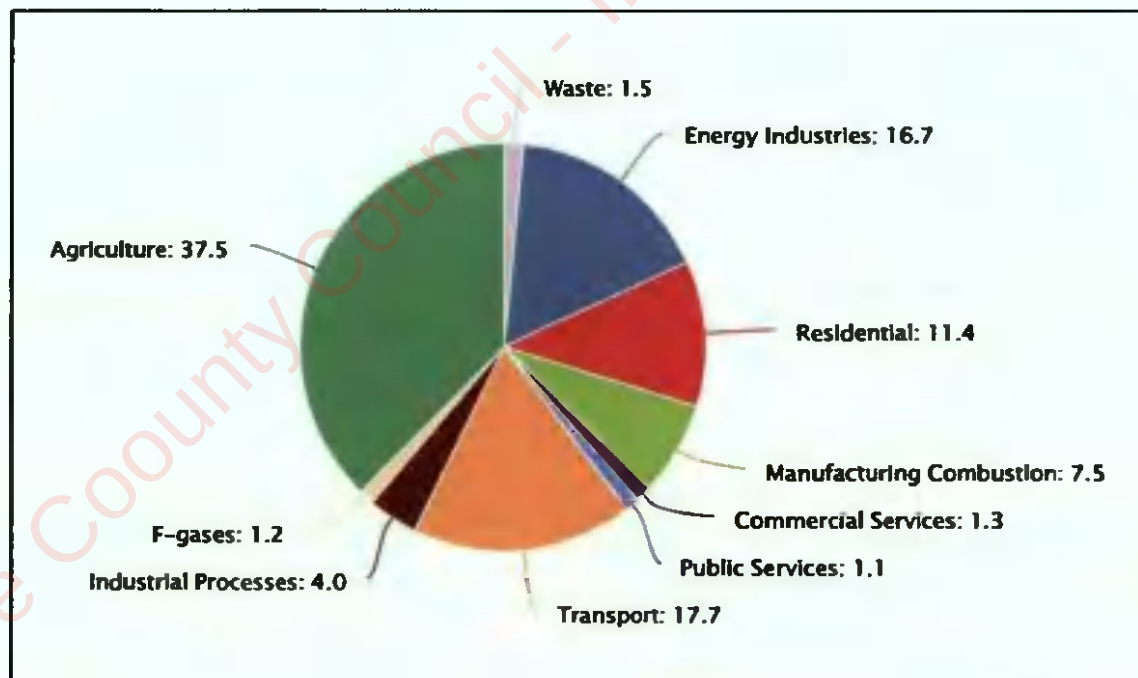


Figure 8-1: Ireland's Greenhouse Gas Emissions by Sector for 2021 (Source: EPA, 2022)

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8.2 Study Methodology

A desktop study involving various national and international documents on climate change and analysis of synoptic meteorological data was carried out in order to compile this Chapter. Furthermore, a semi-quantitative assessment of fugitive dust emissions from operations of the Proposed Development was undertaken and sets out to:

- Assess the existing PM₁₀ concentrations and dust deposition rates
- Identify the potential sources of impacts on air quality and climate
- Identify the local sensitive receptors
- Identify the pathway and distance of sensitive receptors relative to the site
- Analysis of weather data to assess impacts caused by weather events

The impact of dust is generally monitored by measuring rates of dust deposition. According to the EPA Guideline Document *Environmental Management in the Extractive Industry* (2006), there are currently no Irish statutory standards or EPA guidelines relating specifically to dust deposition thresholds for inert mineral dust. There are a number of methods to measure dust deposition, however only the German TA Luft Air Quality Standards (TA Luft, 1986) specify a method of measuring dust deposition – The Bergerhoff Method (German Standard VDI 2119, 1972) – with dust nuisance. It is the only enforceable method available. On this basis, it is recommended that the following TA Luft dust deposition limit value be adopted at site boundaries associated with quarry developments:

- Total dust deposition (soluble and insoluble): **350 mg/m²/day** when averaged over a 30-day period.

Table 8-2: Dust Deposition Limit Values

Measures	Monitoring Frequency	Standard
Dust Emissions	Monthly	350 mg/m ² /day – Bergerhoff Method

8.3 The Existing and Receiving Environment (Baseline Situation)

The Proposed Development is situated in the Townland of Thomastown in the Barony of Carbury, in the Electoral Division Of Cadamstown. Co. Kildare.

The Proposed Development will be accessed via the existing entrance point from the L1522.

Johnstown Bridge village is located ca. 1.7km to the east of the site and the village of Kilshanroe is 1.9 km to the south-west. The setting is predominantly rural with surrounding land uses of agriculture, forestry and a number of one-off residential dwellings and one-off commercial type facilities. The site is located approximately 2.5km from junction 9 on the M4 motorway.

The Proposed Development has a total area, including the access road, of 7.243 hectares (ha) (17.898 acres).

8.3.1 Air Quality

According to the 2012 Regulations (S.I. No. 326 of 2012) the proposed site falls into 'Zone D' of Ireland which is described by the EPA as 'Rural Ireland'. It is expected that existing ambient air quality in the vicinity of the site is characteristic of a rural location with the primary source air emissions (such as particulate matter (dust), NO₂ and hydrocarbons) likely to be of local domestic and agricultural origin. Local agricultural activities may exert a higher or lower influence on dust generation in the vicinity of the site on a seasonal basis.

In conjunction with individual local authorities, the EPA undertakes ambient air quality monitoring at specific locations throughout the country in the urban and rural environment; an Air Quality Report based on data from monitoring stations and a number of mobile air quality units is developed on an annual basis. The EPA's most recent publication 'Air Quality in Ireland, 2021' reports the quality of the air in Ireland based on the data from the National Ambient Air Quality Monitoring Network throughout the year 2021.

When assessing air quality, the EPA focuses on two main pollutants: particulate matter and nitrogen oxides. Measured concentrations of NO₂ for the years 2020 and 2021 are presented in Table 8-3 for Zone D monitoring stations. These results show that current levels of NO₂ are well below the annual mean and 1-hour maximum limit values. In the year 2020, annual mean concentrations of NO₂ ranged from 2 - 17 µg/m³ across all Zone D stations, with no exceedance of the maximum hourly limit (EPA, 2021). In the year 2021, annual mean concentrations of NO₂ ranged from 2.4 - 12.8 µg/m³ across all Zone D stations, with no exceedance of the maximum hourly limit (EPA, 2022).

During 2020, the restriction of movement in Ireland due to the Covid-19 Pandemic had an impact on air quality nationally with a large-scale reduction in vehicular traffic. It is noted that the decrease in NO₂ levels during that year is a direct result of the restrictions placed on movements and construction due to Covid-19.

Based on the EPA data, a conservative estimate of the current background NO₂ concentration in the region of the Proposed Development is 8.5 µg/m³.



Table 8-3: Concentrations of NO₂ at Zone D Monitoring Stations

Station	Objective	Concentration (µg/m ³)		Limit or Threshold Value
		2020	2021	
Emo Court	Annual Mean NO ₂	4	3.6	40 µg/m ³
	Days >200µg/m ³	0	0	35 days
Birr	Annual Mean NO ₂	9	12.8	40 µg/m ³
	Days >200µg/m ³	0	0	35 days
Castlebar	Annual Mean NO ₂	6	6.3	40 µg/m ³
	Days >200µg/m ³	0	0	35 days
Carrick-On-Shannon	Annual Mean NO ₂	17	11.2	40 µg/m ³
	Days >200µg/m ³	0	0	35 days
Kilkitt	Annual Mean NO ₂	2	2.4	40 µg/m ³
	Days >200µg/m ³	0	0	35 days
Edenderry	Annual Mean NO ₂	-	8.8	40 µg/m ³
	Days >200µg/m ³	-	0	35 days

Measured concentrations of PM₁₀ for the years 2020 and 2021 are presented in Table 8-3 for Zone D monitoring stations. As is evident from these results, current levels of PM₁₀ are well below the annual mean limit value. In the year 2020, annual mean concentrations of PM₁₀ ranged from 7 – 15 µg/m³ across all Zone D stations, with no exceedance of short-term limit values (EPA, 2020). In the year 2021, annual mean concentrations of PM₁₀ ranged from 7.8 – 17.8 µg/m³ across all Zone D stations, with no exceedance of short-term limit values (EPA, 2021).

Based on the EPA data, a conservative estimate of the current background PM₁₀ concentration in the region of the Proposed Development is 12 µg/m³.



Table 8-4: Concentrations of PM₁₀ at Zone D Monitoring Stations

Station	Objective	Concentration (µg/m ³)		Limit or Threshold Value
		2020	2021	
Tipperary Town	Annual Mean PM ₁₀	12	12.7	40 µg/m ³
	Days >50µg/m ³	1	3	35 days
Carrick-On-Shannon	Annual Mean PM ₁₀	10	9.4	40 µg/m ³
	Days >50µg/m ³	0	0	35 days
Enniscorthy	Annual Mean PM ₁₀	15	13.7	40 µg/m ³
	Days >50µg/m ³	4	1	35 days
Birr	Annual Mean PM ₁₀	10	12.2	40 µg/m ³
	Days >50µg/m ³	0	2	35 days
Askeaton	Annual Mean PM ₁₀	7	8.7	40 µg/m ³
	Days >50µg/m ³	0	0	35 days
Macroon	Annual Mean PM ₁₀	15	14.6	40 µg/m ³
	Days >50µg/m ³	5	2	35 days
Castlebar	Annual Mean PM ₁₀	14	9.8	40 µg/m ³
	Days >50µg/m ³	2	0	35 days
Cobh Carrigna-foy	Annual Mean PM ₁₀	13	12	40 µg/m ³
	Days >50µg/m ³	0	1	35 days
Claremorris	Annual Mean PM ₁₀	10	9.5	40 µg/m ³
	Days >50µg/m ³	0	1	35 days
Kilkitt	Annual Mean PM ₁₀	8	7.8	40 µg/m ³
	Days >50µg/m ³	0	0	35 days
Cavan	Annual Mean PM ₁₀	9	10.6	40 µg/m ³
	Days >50µg/m ³	0	0	35 days
Roscommon Town	Annual Mean PM ₁₀	11	10.3	40 µg/m ³
	Days >50µg/m ³	0	0	35 days
Edenderry	Annual Mean PM ₁₀	-	17.8	40 µg/m ³
	Days >50µg/m ³		4	35 days

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Station	Objective	Concentration ($\mu\text{g}/\text{m}^3$)		Limit or Threshold Value
		2020	2021	
Mallow	Annual Mean PM_{10}	-	14.7	$40 \mu\text{g}/\text{m}^3$
	Days $>50\mu\text{g}/\text{m}^3$	-	2	35 days
Longford	Annual Mean PM_{10}	-	13.9	$40 \mu\text{g}/\text{m}^3$
	Days $>50\mu\text{g}/\text{m}^3$	-	1	35 days
Cobh Cork Harbour	Annual Mean PM_{10}	-	13.4	$40 \mu\text{g}/\text{m}^3$
	Days $>50\mu\text{g}/\text{m}^3$	-	1	35 days

8.3.2 Macroclimate

Ireland has a typical maritime climate, largely due to its proximity to the Atlantic Ocean and the presence of the Gulf Stream. Due to the moderating effects of the Gulf Stream, Ireland does not suffer the temperature extremes that are experienced by many other countries at a similar latitude. Mean annual temperatures generally range between 9°C and 10°C . Winters tend to be cool and windy while summers are mostly mild and less windy. The prevailing wind direction is between the south and west with average annual wind speeds ranging between 6 knots in parts of south Leinster to over 15 knots in the extreme north. Rainfall in Ireland occurs throughout the year with reasonable frequency. The highest rainfall occurs in the western half of the country and on high ground; and generally, decreases towards the northeast. As the prevailing winds are from the west-southwest, the west of Ireland experiences the largest number of wet days. The area of least precipitation is along the eastern seaboard of the country.

8.3.3 Microclimate

The synoptic meteorological station in Dunsany, Co. Meath is located approximately 20km north-east of the proposed facility; and for the purposes of this Chapter, weather data collected here may be considered similar to that which is experienced in the area of the Proposed Development site.

The weather in the area of the Proposed Development site is generally dominated by cool oceanic air masses, with cool winters, mild humid summers, and a lack of temperature extremes. Based on meteorological data at Dunsany over the last 3 years, the mean January temperature is 4.8°C , while the mean July temperature is 15.8°C . The prevailing wind direction is from a quadrant centred on the southwest. These are moderately warm winds from the Atlantic and they habitually bring rain. The expected annual rainfall for the eastern half of the country ranges between 750 and 1000mm. Easterly winds are less frequent, weaker, and tend to bring cooler weather from the northeast in spring and warmer weather from the southeast in summer.



8.3.3.1 Rainfall

Rainfall is a key indicator of changes in climate, as measurements of rainfall are fundamental to assessing the effects of climate change on the water cycle and water balance. Table 8-5 illustrates the monthly and annual rainfall data collected over a 3-year period (2019-2021) at Dunsany Weather Station. The annual rates of precipitation ranged from 952.6 mm in 2019 to 815.8 mm in 2021 with distribution of the highest monthly rainfall values falling in the autumn and winter months. The long-term average annual rainfall is 869.7mm; this is within the expected range of the eastern half of the country.

Table 8-5: Monthly Rainfall Values (mm) for Dunsany Weather Station from January 2019 to December 2021 (Source: Met Eireann)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2021	104.7	100.4	46.0	11.8	106.7	12.6	96.1	53.3	37.7	101.7	30.2	114.6	815.8
2020	55.1	157.1	47.1	19.3	14.2	76.9	130.9	99.2	69.0	86.1	73.4	89.0	917.3
2019	38.2	34.5	109.7	73.1	39.8	78.1	35.3	123.9	125.0	75.0	154.0	66.3	952.6
LTA ⁴	80.2	59.7	63.4	61.1	65.1	71.5	61.4	77.7	71.8	90.6	84.0	83.2	869.7

8.3.3.2 Wind

Wind at a particular location can be influenced by a number of factors, such as obstructions by trees or buildings, the nature of the terrain, and deflection by nearby mountains or hills. Wind blows most frequently from the south and west for open sites while winds from the northeast and north occur less often. The analysis of hourly weather data from Dunsany synoptic weather station over a period of 11 years suggests that the predominant wind direction blows from the southwest, with windspeeds of between 7 and 10 knots occurring most frequently.



⁴ The 'LTA' is average for the climatological long-term-average (LTA) reference period 1981-2010

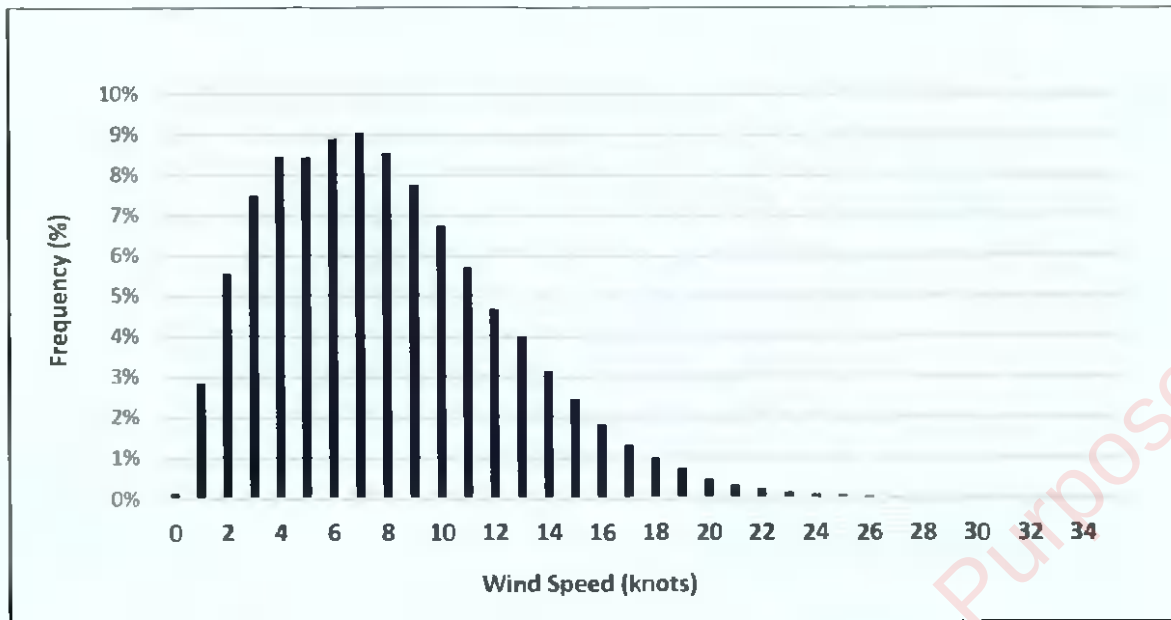


Figure 8-2: Wind Speed Frequency Distribution at Dunsany Synoptic Weather Station over 11 years (2010-2020)

Figure 8-3 provides a wind rose of the predominant wind directions and associated wind speeds at Dunsany. As is visible from Figure 8-3, the prevailing wind is from a south-westerly direction with an annual incidence of 34.29% for winds between 200 and 250 degrees. The most frequent wind speed associated with this wind direction is between 7 and 10 knots which is considered a 'gentle breeze' in terms of the Beaufort scale, this wind direction and wind speed occurs in combination approximately 11.30% of the time. The overall most common windspeed is between 7 and 10 knots, occurring in 31.78% of incidences, and wind speeds of between 11 and 16 knots occurring in 21.66% of incidences.

The lowest frequency is for winds blowing from the northern quadrant at approximately 3.61% of the time. The incidence of wind between 1 and 6 knots is about 41.78% with wind speeds of above 17 knots (8.7 m/s) occurring in just 4.59% of incidences. This wind rose is broadly representative of the prevailing conditions experienced at the Proposed Development site.



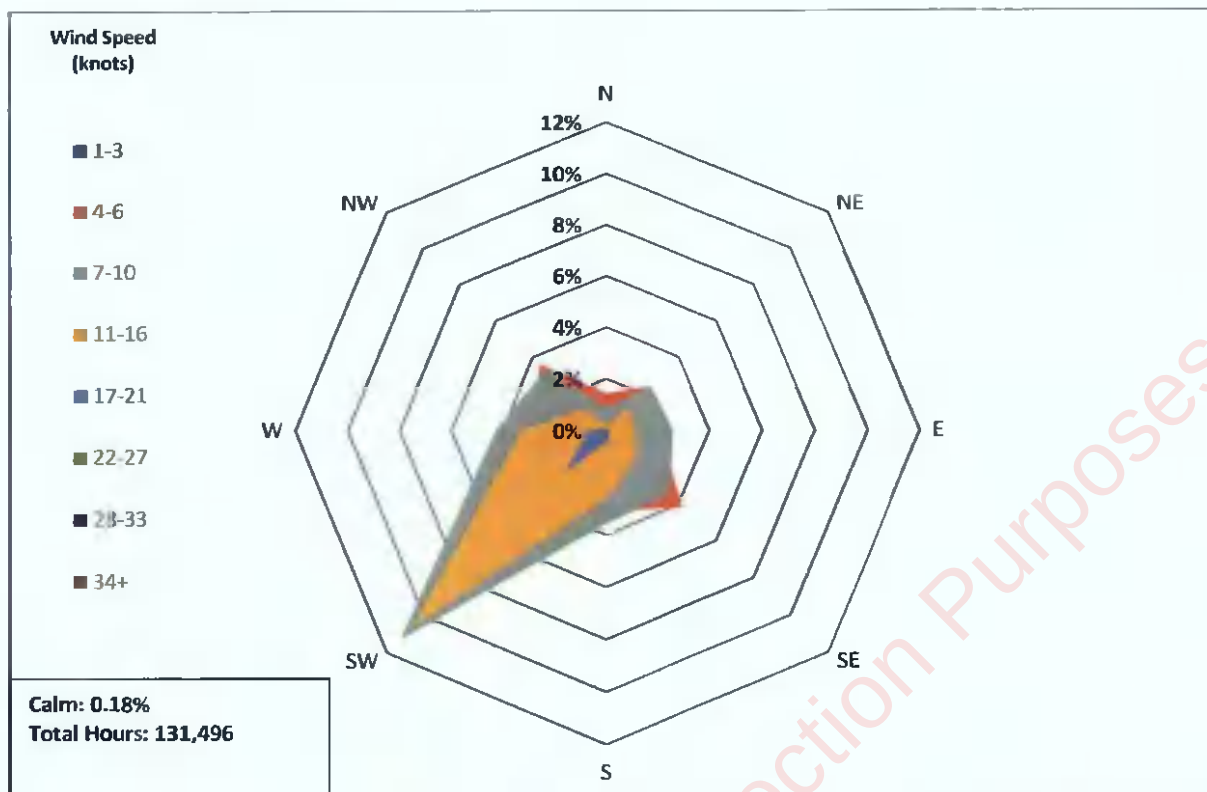


Figure 8-3: 13-year Windrose at Dunsany Weather Station 2007-2021 (Developed using Met Eireann Hourly Data)

8.4 Characteristics of the Proposed Development

The Proposed Development comprises the importation of material to in-fill and re-contour the site. It comprises of the importation of soil and subsoil from greenfield development sites. The Applicant proposes, subject to the grant of permission, to import clean greenfield soil and stone to remediate approximately 3.689 ha of the total site.

The 3.689ha is divided into two distinct areas – Area 1 is 2.718ha and Area 2 is 0.971ha. A fill plan has been drawn up for the importation of 68,970m³ of soil to fill Area 1, and 16,670m³ to fill Area 2, equating to a total of 85,640m³ (ca. 128,460 tonnes) of soil and subsoil. A volume to weight conversion factor of 1.50 is taken from the Waste Management (Landfill Levy) Regulations, 2008, SI 199 of 2008.

It is proposed to carry this work out over a 5-year period, subject to the availability of appropriate soil, to allow the soil to settle naturally with minimal compaction. The soil and subsoils will be mixed, to minimise compaction and improve drainage.

Once planning permission is obtained, it is intended to apply to Kildare County Council for a Waste Facility Permit. Material will be accepted in accordance with the conditions of the permit. As part of the Environmental Management Plan a register of incoming materials for the site will be maintained at all times. The only List of Waste (LoW) code accepted on site will be 17 05 04 - Soil and Stones other than those mentioned in 17 05 03.

8.5 Potential Impact of the Proposed Development

8.5.1 Potential Impacts on Air Quality

There are a number of potential sources of dust generation associated with the filling phase of the Proposed Development at Thomastown, Johnstownbridge, Co. Kildare. Additionally, the increased movement of vehicles during this phase will potentially generate exhaust fumes and consequently potential emissions of volatile organic compounds, nitrogen oxides, sulphur oxides, and PM₁₀ (dust).

8.5.1.1 Dust

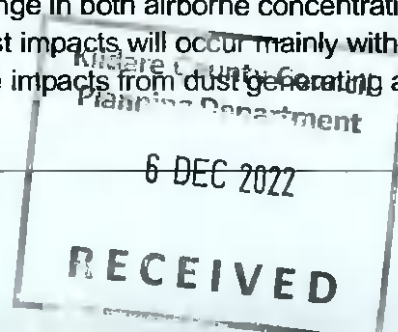
The main potential impact on ambient air quality from soil and stones processing activities will be that associated with the deposition of dust generated by mechanical processing and transfer operations. The primary sources of dust identified include stockpiling, handling, and placement of materials. They are generally dispersed sources rather than specific point sources, which dictates the measures required to mitigate potential dust-related impacts. Furthermore, the movement of vehicles and use of machinery during this phase will potentially generate exhaust fumes and consequently potential emissions of volatile organic compounds, nitrogen oxides, sulphur oxides, and particulate matter (PM_{2.5} and PM₁₀).

Dust emissions associated with vehicular movements are largely due to the resuspension of particulate materials that are present on road surfaces. The movement of vehicles within the facility and to and from the facility to the external road network has potential to cause dust due to deposition from the vehicles themselves if appropriate mitigation measures are not considered.

The potential for dust generation depends on site activity, particle size, the moisture content of materials, and meteorological conditions. The type of material being processed can also have a significant influence on potential emissions. Soil and stone deposits may possess an inherently high moisture content, which can cause particles to adhere and thereby affords a high degree of natural mitigation. However, this does not negate the potential for fugitive emissions from this material if it dries out, especially during high wind conditions. The prevailing meteorological conditions have the largest impact on the rate of dust dispersion. During periods of prolonged dry weather, there is the potential for dust dispersion rates to be higher than average. Where rainfall has or is occurring, dust emissions can be dramatically reduced.

Potential dust arising from the infill site can reduce amenity in the local community if dust soiling takes place. The coarser dust associated with these effects may be referred to as 'nuisance dust'. Smaller dust particles remain airborne for longer and have the potential to increase local ambient air concentrations of suspended particulate matter (PM₁₀ and PM_{2.5}) which can be associated with a range of health concerns (IAQM, 2016). It is further noted that ambient air quality limit values for these pollutants are rarely exceeded in rural areas where traffic pollution is significantly less than in urban areas.

According to Institute of Air Quality Management Guidance on the Assessment of Mineral Dust Impacts for Planning (IAQM, 2016), the experience of the IAQM Working Group together with published studies and anecdotal evidence on the change in both airborne concentrations and the rate of deposition with distance, suggests that dust impacts will occur mainly within 400m of the operation, even at the dustiest of sites. Adverse impacts from dust generating activities



are uncommon beyond 250m, and continuous or stark concerns about dust are most likely to be experienced within 100m of the dust source; the greatest potential for high rates of dust deposition and elevated PM₁₀ concentrations occurs within this distance.

The significant potential impacts associated with dust emissions from the Proposed Development are outlined in Table 8-6:

Table 8-6: Potential Impacts Associated with Dust Emissions

Element	Description	Potential Risk
Source	Stockpiling of materials	Particulate matter on surface of stockpiles
	Unloading of materials	Particulate matter being handled and re-suspended
	Traffic movements	Resuspension of particulate matter and deposition due to facility vehicles
Pathway	Dry days with wind speeds >5m/s	Potential for particulate suspension and deposition
	Distance between sensitive receptor and dust source <400m	Potential for particulate deposition
Receptors	Human sensitive receptors	Health impacts Visual impacts

According to IAQM Guidance (2016), the primary factor influencing the Pathway is the distance between the sensitive receptor and the dust sources. However, other factors can cause a higher or a lower category to be assigned than would be the case based on distance alone. These factors include:

- Orientation of receptors relative to the prevailing wind direction; and
- Topography, terrain and physical features.

Meteorological conditions greatly affect the level of dust emissions and subsequent deposition downwind of the source; the most predominant being rainfall and wind speed. Relatively high levels of moisture in the surrounding air, soils, and precipitation helps to suppress dust due to the cohesive properties of water between dust particles. The least favourable meteorological conditions for dust generation would typically be warm days with strong winds and low precipitation.

Table 8-7 outlines the hourly percentage distribution of wind speed and direction at Dunsany synoptic weather station over a period of 13 years. This data suggests that the most frequent wind directions prevail from the west and southwest with similar frequencies for both. The corresponding most frequent wind speed is between 7 and 10 knots which is considered a 'gentle breeze' in terms of the Beaufort scale. This corresponds with the wind speed frequency distribution shown in Figure 8-2. **Error! Reference source not found.**

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Table 8-7: Percentage Distribution of Wind Speeds and Direction at Dunsany Weather Station (January 2007 - December 2021)

Wind speed (Knots)		<1	1 - 3	4 - 6	7 - 10	11-16	17-21	22-27	28-33	34+	% Dry Days
Wind Direction	Degrees										
North	350 - 10	0.18	1.09	1.43	0.88	0.21	0.01	0.00	0.00	0.00	32.5%
North-east	20 - 70		1.86	2.40	2.40	1.17	0.15	0.03	0.00	0.00	
East	80 - 100		0.92	2.07	2.58	1.12	0.09	0.00	0.00	0.00	
South-east	110 - 150		2.32	4.16	3.44	1.54	0.16	0.02	0.00	0.00	
South	170 - 190		1.74	3.12	3.57	2.57	0.44	0.05	0.00	0.00	
South-west	200 - 250		3.49	6.22	11.30	10.58	2.25	0.43	0.02	0.00	
West	260 - 280		1.60	2.95	4.28	3.28	0.70	0.13	0.01	0.00	
North-west	290 - 340		2.79	3.62	3.33	1.19	0.11	0.00	0.00	0.00	

Sensitive receptors, as noted in Table 8-8, in the vicinity of the Proposed Development are described as one-off rural housing and farm buildings of low density. The Institute of Air Quality Management (IAQM) (2016) propose that the majority of dust deposition will typically occur within 100m of the operational area. The closest sensitive receptors (SR) are outside the site line boundary and are all at a distance which is greater than 100m from the operational area. The closest sensitive receptors to site operations as indicated in Table 8-8 are SR4, SR5 and SR6 at approximately 250m south of the proposed facility. In addition, there are three more SRs located to the south, three located to the southwest, and the remaining two SRs are positioned to the southeast.

All sensitive receptors positioned within a 400m radius of the site have been identified in Table 8-8.



Table 8-8: Sensitive Receptors located within a 400m Radius of the site

Sensitive Receptor ID	Coordinates	Distance from site (m)	Orientation relative to site	Receptor Type
SR1	53.39950, -6.88934	400m	South-west	Residential
SR2	53.39930, -6.88729	290m	South-west	Residential
SR3	53.39915, -6.88659	270m	South-west	Residential
SR4	53.39861, -6.88380	250m	South	Residential
SR5	53.39857, -6.88293	250m	South	Residential
SR6	53.39848, -6.88247	250m	South	Residential
SR7	53.39827, -6.88202	265m	South	Residential
SR8	53.39799, -6.88148	295m	South-east	Residential
SR9	53.39778, -6.88073	315m	South-east	Residential

Table 8-9 provides a summary of all events of hourly wind speeds above 2m/s and corresponding directions from Dunsany weather station. Hourly data which featured winds of below 2m/s have been excluded for the purposes of this assessment. Data displayed in Table 8-8 shows south-west and west as the prevailing wind directions. In light of this data, sensitive receptors were assessed and those with potential to be affected by fugitive dust emissions were identified.

Table 8-9: Summary of Prevailing Wind Directions at Dunsany Weather Station above 2m/s (1-3 knots)

Wind direction prevailing	Frequency (%)	Sensitive Receptor likely to be affected (ID)	% Dry days (2017 – 2019)
North	2.52	SR4, SR5, SR6, SR7	32.5%
North-east	6.15	SR1, SR2, SR3	
East	5.87	-	
South-east	9.32	-	
South	9.75	-	
South-west	30.80	-	
West	11.85	-	
North-west	8.25	SR8, SR9	



Sensitive receptors likely to be impacted by prevailing wind conditions would need to be positioned to the northeast and east of the site; there are no receptors positioned to the northeast of the site. In the context of IAQM (2016), all receptors are positioned more than 100m away from the Proposed Development which suggests that fugitive dust will have adequate time to deposit on the preceding landscape before reaching the sensitive receptors. Incorporating mitigation measures will substantially reduce any likelihood of fugitive emissions causing an impact on sensitive receptors in the vicinity of the proposed facility.

Receptors located to the south and southwest of the facility (SR1, SR2, SR3, SR4, SR5, SR6, and SR7) would require prevailing winds from the north and northeast to be potentially impacted in this regard; these winds are uncommon at <7% frequency (2.52 and 6.15, respectively). SR8 and SR9 could potentially be impacted by winds which blow from the northwest (<9% frequency). All identified sensitive receptors are located more than 100m from the site boundary. The trees and hedgerows which are currently present on the site boundary will further act as a natural buffer for dust deposition for all sensitive receptors. It can therefore be concluded that dust emissions associated with the Proposed Development will not have a significant impact on the local sensitive receptors.

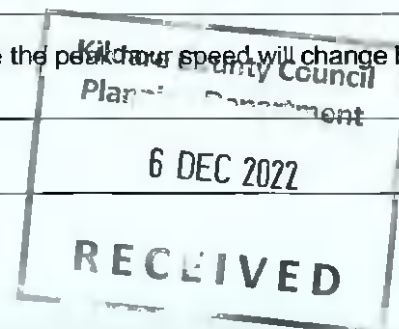
8.5.1.2 Traffic-Related Air Emissions

Development-related traffic will use local roads to access the facility with potential increases of traffic flow on some roads and subsequent associated emissions of VOCs, nitrogen oxides, sulphur dioxides and increased particulate matter concentrations.

In terms of associated impacts on air quality, Table 8-10 outlines the criteria that are prerequisite for an air quality assessment. According to IAQM guidance (2017), if none of the criteria are met, then there should be no requirement to carry out an air quality assessment for the impact of the development on the local area, and the impacts can be considered as having an insignificant effect.

Table 8-10: Indicative Criteria for Requiring an Air Quality Assessment (Source: IAQM, 2017)

Potential Change resulting from Proposed Development	Indicative Criteria to Proceed to an Air Quality Assessment
Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors	A change of LDV flows of more than 1000 Annual Average Daily Traffic (AADT)
Cause a significant change in Heavy Duty Vehicle (HGV) flows on local roads with relevant receptors	A change of HGV flows of more than 100 Annual Average Daily Traffic (AADT)
Realign roads, i.e. changing the proximity of receptors to traffic lanes	Where the change is 5m or more
Cause a change in Daily Average Speed (DAS)	Where the DAS will change by 10 km/h or more
Cause a change in peak hour speed	Where the peak hour speed will change by 20km/h or more.



As per Chapter 12.1 Traffic, the criteria presented in Table 8-10 have not been met by the Proposed Development; it is therefore considered unlikely for significant air quality impacts to occur as a result of increased traffic flow and a quantitative assessment is not required in this case.

8.5.2 Potential Impacts on Climate

There is the potential for combustion emissions from onsite machinery and traffic derived pollutants of CO₂ and N₂O to be emitted during the construction phase of the development. However, due to the size and duration of the construction phase, and the mitigation measures proposed, the effect on national GHG emissions will be insignificant in terms of Ireland's obligations under the Kyoto Protocol and therefore will have no considerable impact on climate.

8.5.3 Potential Cumulative Impacts

Cumulative Impacts can be defined as *"impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project"*. Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the accumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

The cumulative effects on the air quality and climate of the Proposed Development and other existing developments have been considered, in particular through the generation of air pollutants and greenhouse gas emissions. There are no known committed or planned developments in the vicinity of the Proposed Development that would have the potential to cause a cumulative impact on the level of air pollutants and greenhouse gas emissions.

8.5.4 "Do Nothing" Impact

A do-nothing scenario would result in the site remaining undeveloped. If the Proposed Development were not to proceed there would be no immediate impact on the air quality in the area or the macro and microclimate.

8.6 Avoidance, Remedial, and Mitigation Measures

8.6.1 Air Quality

Dust emissions as a result of site operations are not considered to pose a significant impact to air quality in the vicinity of the Proposed Development. However, to minimise the risks of such impacts occurring, a series of mitigation measures have been prepared:

- Where practicable, movements of large volumes of material will not be carried out in periods of dry and windy weather unless suitable mitigation measures are implemented;
- In the event of prolonged dry weather, rotary atomisers and water bowzers will be employed to dampen material and avoid dust suspension;

- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind and shorten the length of time for which material will be stockpiled;
- Harvested rainwater will be used as a wheel wash for dust suppression to ensure dust is not transferred to external roads;
- Operational activities are located away from dust sensitive land uses and will be carried out over 100m from local sensitive receptors.
- Exhaust emissions from construction vehicles and machinery will be minimised by avoidance of engines running unnecessarily as idle engines will not be permitted for excessive periods

8.6.2 Climate

As negative climatic impacts associated with the development are negligible, no mitigation measures are proposed.

8.6.3 Worst Case Scenario

Worst case scenario would involve failures of mitigation measures for the Proposed Development. In the event of this, it is considered that localised dust nuisances may occur. However, this is deemed highly unlikely and indeterminable.

8.7 Residual Impacts

Residual Impacts are defined as *'effects that are predicted to remain after all assessments and mitigation measures'*. They are the remaining 'environmental costs' of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts. Potential residual impacts from the Proposed Development were considered as part of this environmental assessment.

No negative residual impacts in the context of air quality and climate are anticipated regarding this Proposed Development.

8.8 Monitoring

The Proposed Development will be subject to a Waste Facility Permit (WFP) from Kildare County Council. The operator will comply with monitoring requirements as per the conditions of the WFP. Quarterly operational dust monitoring will be put in place to ensure dust mitigation measures are effective in controlling emissions. This will be conducted using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119.

8.9 Interactions

Interactions between Air Quality and Climate and other aspects of this Environmental Impact Assessment Report have been considered and are detailed below.

8.9.1 Population and Human Health

Interactions between Air Quality and Population and Human Health have been considered as the Operational Phase has the potential to cause health issues as a result of impacts on air quality from dust nuisances and potential traffic derived pollutants. However, the mitigation measures employed at the Proposed Development will ensure that all impacts are compliant with ambient air quality standards and human health will not be affected.

8.9.2 Land, Soils and Geology

The infilling of soils at the Proposed Development Site has the potential to generate nuisance impacts (i.e., dust). Dust emissions as a result of site operations are not considered to pose a significant impact to air quality in the vicinity of the Proposed Development. However, appropriate mitigation and monitoring measures have been recommended and will be implemented at the site in order to minimise the risk of dust emissions arising during the Proposed Development. Provided such measures are adhered to, it is not considered that significant air quality impacts will occur. Furthermore, the trees and hedgerows which are currently present on the site boundary will further act as a natural buffer for dust deposition for all sensitive receptors.

8.9.3 Traffic

Traffic derived pollutants which may affect Air Quality and Climate are deemed insignificant due to the marginal change in traffic volume and movement associated with the Proposed Development as outlined in Chapter 12, Section 2.1 Traffic.

8.10 Difficulties Encountered When Compiling

No difficulties were encountered when compiling this Chapter.

8.11 References

Air Pollution Act 2012 (S.I. No. 326 of 2012) Irish Statute Book.

Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011) Irish Statute Book.

Air Quality, Clean Air for Europe Directive (2008/50/EC) EUR-Lex.

Department of the Environment, Transport and the Regions, 1995. The Environmental Effects of Dust from Surface Mineral Workings- Volume 2. Technical Report.

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Environmental Protection Agency (2019) Ireland's Final Greenhouse Gas Emissions 1990-2017.

Environmental Protection Agency (2019) Irelands National Inventory Report: Greenhouse Gas Emissions 1990-2017.

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European Commission (2007) 2020 Climate & Energy Package.

European Commission (2011) A Roadmap for Moving to a Competitive Low Carbon Economy in 2050.

European Commission (2014) 2030 Climate & Energy Framework.

German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft.

Institute of Air Quality Management (IAQM) 2016. Guidance on the Assessment of Mineral Dust Impacts for Planning, London, United Kingdom.

Intergovernmental Panel on Climate Change (2006) IPCC Guidelines for National Greenhouse Gas Inventories.

Intergovernmental Panel on Climate Change (2019) Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

Met Eireann (2021) Daily Meteorological Data for Dublin Airport Synoptic Weather Station.

Met Eireann (2021) Hourly Meteorological Data for Dublin Airport Synoptic Weather Station.

Met Eireann (2021) Monthly Meteorological Data for Dublin Airport Synoptic Weather Station.

United Nations Framework Convention on Climate Change (1998) Kyoto Protocol to the UNFCCC.

United Nations Framework Convention on Climate Change (2012) The Doha Amendment to the Kyoto Protocol.

United Nations Framework Convention on Climate Change (2015) The Paris Agreement.



9 NOISE & VIBRATION

9.1 Introduction

This Chapter of the EIAR provides a description and assessment of the likely impact of the Proposed Development from noise. This Chapter discusses the existing ambient noise levels at nearby sensitive receptors, the potential impacts of the Proposed Development on the existing ambient noise environment and the mitigation measures that may be employed to reduce or eliminate any potential impact.

9.1.1 Quality Assurance and Competence

This Chapter was prepared by Laura Griffin (BA Hons English and Geography, MSc Climate Change), Environmental Consultants, Enviroguide Consulting. Laura has experience working on a number of EIARs and EIA Screening Reports for projects of a similar scale to the Proposed Development.

9.2 Study Methodology

This assessment examined the likely impacts of sound pressure levels generated by the Proposed Development located in the townland of Thomastown in the Barony of Carbury, in the Electoral Division of Cadamstown, Co. Kildare. Noise calculations were used to predict and assess the likely impact of equipment on noise sensitive receptors.

For the purpose of the assessment 'sensitive receptors' terminology used describes any persons, locations or otherwise that may be susceptible to changes as a consequence of the Proposed Development.

The primary noise impacts associated with this Proposed Development are likely to be due to:

- Truck movements through the site and tipping of inert materials
- Additional plant and equipment within the facility

With respect to the listed noise impacts, the key objective of the proposed facility is to manage activities to ensure any significant increase in noise emissions are minimised.

Documents consulted during the preparation of this EIAR Chapter are listed in the References section. The acoustics section has been compiled taking cognisance of:

- Design Manual for Roads and Bridges Volume 11 Section 3 Part 7 (HD 213/11 – Revision 1) (The Highways Agency et al., 2011);
- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise.
- ISO 1996-1:2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures
- ISO 1996-2:2017 Acoustics - Description, measurement and assessment of environmental noise Part 2: Determination of sound pressure levels
- ISO 9613-1:1993 Acoustics - Attenuation of sound during propagation outdoors – Part 1: Calculation of the absorption of sound by the atmosphere

- ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors -- Part 2: General method of calculation
- Environmental Protection Agency (2016) Guidance Note for Noise (NG4): Licence Applications, Surveys and Assessments in Relation to Scheduled Activities.
- Guidelines for the Treatment of Noise & Vibration in National Road Schemes, National Roads Authority, Revision 1, 25th October 2004

The following noise indices, analysis and observations were reviewed.

- LAeq - The A-weighted, equivalent continuous sound level of the measurement period. Represents an 'energy average' of the sound pressure levels measured.
- LA90 - The A-weighted, noise level exceeded for 90% of the measurement period. Calculated by statistical analysis of the measurement data.
- LA10 - The A-weighted, noise level exceeded for 10% of the measurement period. Calculated by statistical analysis of the measurement data.

9.2.1 Desk Study

The noise assessment reviewed all existing information relating to the site and its environs, which involved a desk-based study of the following:

- An evaluation of the site and the surrounding area to assess certain changes to noise that are likely to impact the surrounding environs.
- Identification of sensitive receptors for a complete list of the sensitive receptors identified as part of this assessment, see Section 9.5.1.
- BS 5228 2009 +A1 2014 Code of practice for noise and vibration control on construction and open sites with respect to the controlling noise and vibration impacts

9.3 The Existing and Receiving Environment (Baseline Situation)

The Proposed Development is situated in the Townland of Thomastown in the Barony of Carbury, in the Electoral Division of Cadamstown. Co. Kildare.

The Proposed Development will be accessed via the existing entrance point from the L1522.

Johnstown Bridge village is located ca. 1.7km to the east of the site and the village of Kilshanroe is 1.9 km to the south-west. The setting is predominantly rural with surrounding land uses of agriculture, forestry and a number of one-off residential dwellings and one-off commercial type facilities. The site is located approximately 2.5km from junction 9 on the M4 motorway.

The Proposed Development has a total area, including the access road, of 7.243 hectares (ha) (17.898 acres).

The landholding is in a rural location and is owned by the Applicant. The land is undeveloped and is of marginal agricultural use in that the site is too soft during winter months to support grazing animals.

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9.3.1 Quiet Area Screening

The location of the Proposed Development was screened in order to determine if it is located in or near an area that could be considered a 'Quiet Area' in open country according to the Environmental Protection Agency's publication *Environmental Quality Objectives - Noise in Quiet Areas, 2003*.

The following criteria were assessed for this determination:

- At least 3 km from urban areas with a population >1,000 people;
- At least 10 km from any urban areas with a population >5,000 people;
- At least 15 km from any urban areas with a population >10,000 people;
- At least 3 km from any local industry;
- At least 10 km from any major industry centre;
- At least 5 km from any National Primary Route, and;
- At least 7.5 km from any Motorway or Dual Carriageway.

If the site does not meet these criteria it is not considered to be a quiet area as per the definition of the Environmental Protection Agency. 'Quiet Areas', according to NG4 (2016), they have a much more stringent noise criterion set out in the guidelines. Before relevant noise criterion can be applied, 'Quiet Area Screening' must be performed to identify or rule out the site as a Quiet Area. Quiet Area screening results can be viewed in Table 9-1.

Table 9-1: Quiet Area Screening of the Development Location

Quiet Area Screening of the Development Location			
Screening Question	Answer (Yes/No)		Screening Results
Is the site >3km away from urban areas with a population >1,000 people?	Yes ☐	No ☒	Enfield town, population 3,239 (Census, 2016) is located approximately 3km northeast of the site.
Is the site >10km away from urban areas with a population >5,000 people?	Yes ☒	No ☐	The Proposed Development is not within 10km of an urban area with a population >5,000 people.
Is the site >15km away from urban areas with a population >10,000 people?	Yes ☒	No ☐	The Proposed Development is not within 15km of an urban area with a population >10,000 people.
Is the site >3km away from any local industry?	Yes ☐	No ☒	The Proposed Development is bounded by industrial and commercial sites.
Is the site >10km away from any major industry centre?	Yes ☐	No ☒	The Proposed Development is bounded by industrial and commercial sites.
Is the site >5km away from any national primary route?	Yes ☒	No ☐	The Proposed Development is not within 5km of a national primary route.
Is the site >7.5km away from any motorway or dual carriageway?	Yes ☐	No ☒	The M4 motorway runs approximately 830m from the Proposed Development site.
QUIET AREA?	No		The site does not meet these criteria it is not considered to be a quiet area.

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According to the EPA Guidance, NG4, where an area is determined not to be a 'quiet area' baseline monitoring should be conducted to determine if there is a low background noise. Due to the location of the Proposed Development, within an area where industrial facilities are operating in the vicinity of the Proposed Development, and within 830m proximity to the M4 national motorway and 3km from Enfield, a low background noise would not be predicted. As such, baseline noise monitoring for the site is recommended and any monitoring will be carried out in accordance with the planning permission for the site (once obtained).

9.3.2 Recommended Noise Limits

Table 9-2 shows the recommended noise limits for the Waste Facility Permit application relating to this Proposed Development.

Table 9-2: Recommended Noise Limit Criteria (Source: EPA NG4)

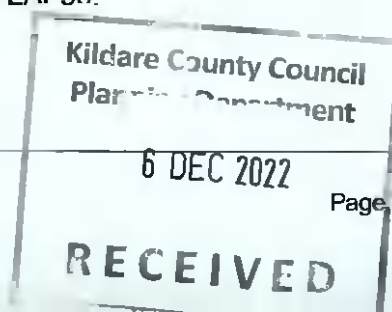
Scenario	Daytime Noise Criterion, dB L _A ,T (07:00 to 19:00hrs)	Evening Noise Criterion, dB L _A ,T (19:00 to 23:00hrs)	Night-time Noise Criterion, dB L _A eq,T (23:00 to 07:00hrs)
Quiet Area	Noise from the permitted site to be at least 10dB below the average daytime background noise level measured during the baseline noise survey.	Noise from the permitted site to be at least 10dB below the average evening background noise level measured during the baseline noise survey.	Noise from the permitted site to be at least 10dB below the average night-time background noise level measured during the baseline noise survey.
Areas of Low Background Noise	45dB	40dB	35dB
All other Areas	55dB	50dB	45dB
Proposed Noise Limits for the Proposed Development	55dB	50dB	45dB

9.3.3 Noise

Noise is defined as any sound, that has the potential to cause disturbance, discomfort or psychological stress to a person exposed to it, or any sound that could cause actual physiological harm to a person exposed to it, or physical damage to any structure exposed to it. In summary noise can be defined as any unwanted sound. Sound levels are expressed in decibels (dB) on a logarithmic scale, where 0dB is nominally the "threshold of hearing" and 120dB is nominally the "threshold of pain" (refer to Figure 9-1).

Background noise is defined as 'the steady existing noise level present without contribution from any intermittent sources. The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 per cent of a given time interval. T (L_AF₉₀, T)'. According to the EPA Noise Guidance NG4, an area of low background noise is one where the existing background noise levels measured during an environmental noise survey are as follows:

- Average Daytime Background Noise Level ≤40dB L_AF₉₀, and;
- Average Evening Background Noise Level ≤35dB L_AF₉₀, and;
- Average Night-time Background Noise Level ≤30dB L_AF₉₀.



Due to the close proximity of the Proposed Development to major road networks and other commercial and industrial facilities, the environmental noise is creating a high background noise level in the area.

Figure 9-1 gives depiction of typical sounds and their noise levels on a decibel scale.

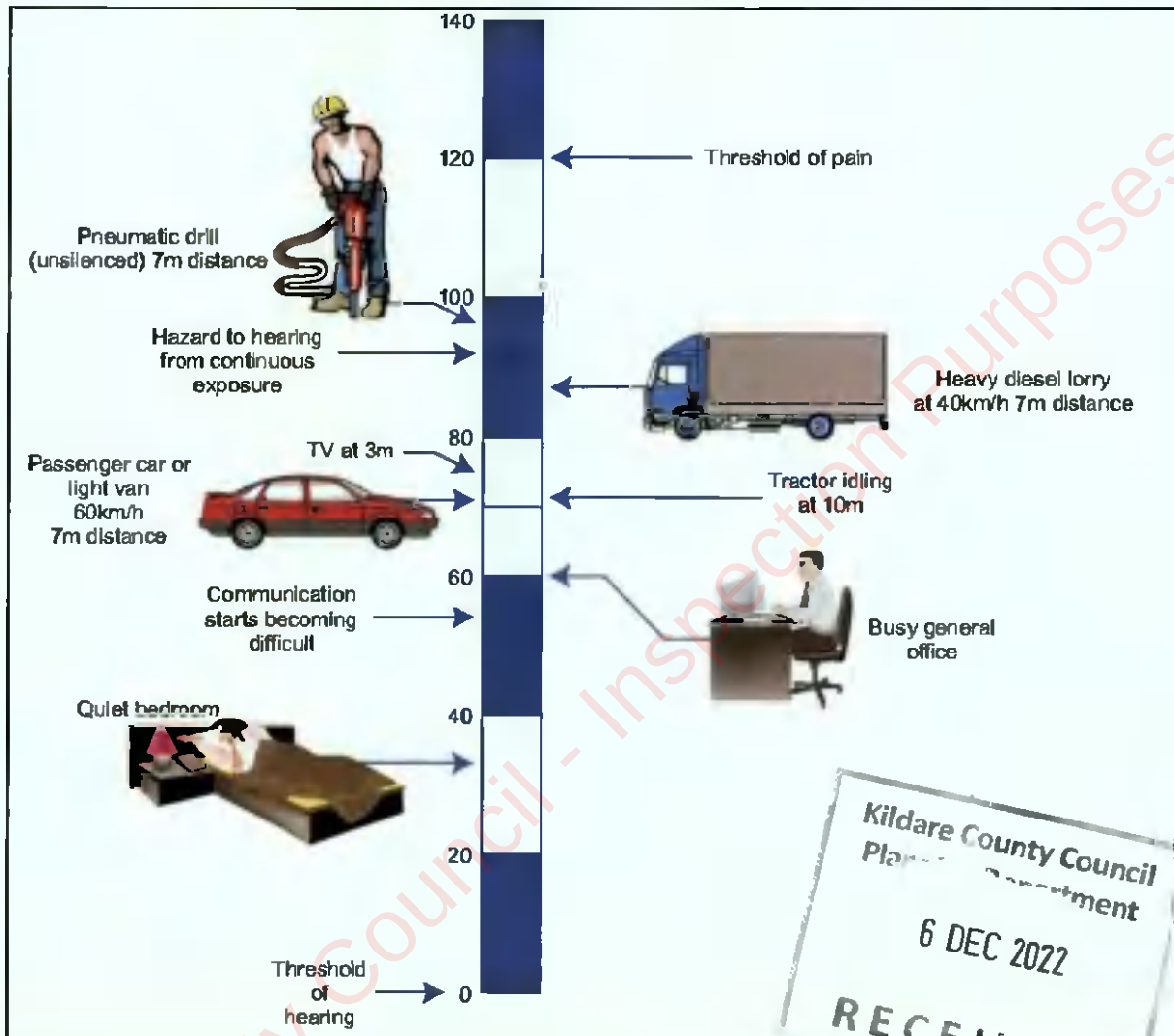


Figure 9-1: Scale and Indicative Noise Levels on the dB(A) Scale (Based on guidance taken from: Design Manual for Roads and Bridges, Volume 11 Consolidated Edition 1993)

9.4 Characteristics of the Proposed Development

The Applicant is seeking planning permission from Kildare County Council for the importation of material to in-fill and re-contour the site. It comprises of the importation of clean topsoil and subsoil. The Applicant proposes, subject to the grant of permission, to import clean greenfield soil and stone to remediate approximately 3.689 ha of the total site, in order that the site can be rendered suitable for agriculture.

The 3.689ha is divided into two distinct areas – Area 1 is 2.718ha and Area 2 is 0.971ha. A fill plan has been drawn up for the importation of 68,970m³ of soil to fill Area 1, and 16,670m³ to fill Area 2, equating to a total of 85,640m³ (ca. 128,460 tonnes) of soil and subsoil. A volume

to weight conversion factor of 1.50 is taken from the Waste Management (Landfill Levy) Regulations, 2008, SI 199 of 2008.

It is proposed to carry this work out over a 5-year period, subject to the availability of appropriate soil, to allow the soil to settle naturally with minimal compaction. The soil and subsoils will be mixed, to minimise compaction and improve drainage.

Once planning permission is obtained, it is intended to apply to Kildare County Council for a Waste Facility Permit. Material will be accepted in accordance with the conditions of the permit. As part of the Environmental Management Plan a register of incoming materials for the site will be maintained at all times. The only List of Waste (LoW) code accepted on site will be 17 05 04 - *Soil and Stones other than those mentioned in 17 05 03*.

9.5 Potential Impact of the Proposed Development

This section assesses the impact of the Proposed Development on the human environment. The noise-generating activities associated with the site are as follows:

- Truck movements through the site and tipping of inert materials
- Additional plant and equipment within the facility

9.5.1 Noise Sensitive Locations

The EPA define noise sensitive locations as '*any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels*'.

Identified noise sensitive receptors can be viewed in Figure 9-2.





Figure 9-2: Location of Noise Sensitive Locations in relation to Project site

Figure 9-2 shows the location of the Proposed Development with a 250m buffer around the site. This figure identifies 9 dwellings which are each treated as a 'Noise Sensitive Location' (NSL).

9.5.2 Noise from Operational Traffic

The Design Manual for Roads and Bridges (DMRB) Volume 11 Section 3 Part 7 (HD 213/11 – Revision 1) (The Highways Agency et al., 2011) states that “changes in traffic volume on existing roads or new routes may cause either of the threshold values for noise to be exceeded. A change in noise level of 1dB LA10, 18h is equivalent to a 25% increase or a 20% decrease in traffic flow, assuming other factors remain unchanged and a change in noise level of 3dB LA10, 18h is equivalent to a 100% increase or a 50% decrease in traffic flow”.

No traffic routes are predicted to experience increases of more than 25% in total traffic flows during the Operational Phase and therefore no detailed assessment is required as per the DMRB Guidelines. Refer to Chapter 12 of the EIAR for a detailed traffic assessment report.

The impact of noise from operational traffic will be unnoticeable and will not have a negative impact.

9.5.3 Noise from Mobile Plant On-site

Mobile equipment such as dozers and excavators, may operate in a cyclic fashion in which a period of full power is followed by a period of reduced power.

BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Noise sets out typical noise levels for items of construction plant. Table 9-3 sets out the assumed plant items during the key phases of the development.

Noise prediction calculations have been completed for noise from the use of onsite plant up to 250m from the source. According to the inverse square law, for each doubling of distance from a point source, the sound pressure level decreases by approximately 6 dB. The reference levels were calculated and projected for a range of distances from the source to the appropriate receptor using the following formula:

$$L_{Source} \approx L_{Ref} - 20 \cdot \log_{10}(R2/R1)$$

Where:

L_{Source} = Sound Pressure Level at Initial Location

L_{Ref} = Sound Pressure Level at the new Location

$R1$ = Distance from the noise source to initial location

$R2$ = Distance from noise source to the new location

The calculations make a number of assumptions such as:

1. There is a straight line between the source and observer.
2. Meteorological conditions are static.
3. There are no natural barriers that affect attenuation of noise other than distance.
4. All plant items are operating from a single source simultaneously and at full capacity.
5. All plant items are operating at the edge of the work area closest to the sensitive receptor.

The inverse square law is the logical first estimate of the sound you would get at a distant point in a reasonably open area. It is noted that the sound intensity from a point source will obey the inverse square law if there are no reflections or reverberation. If there are barriers between the source and the point of measurement, you are likely to get less than what the inverse square law predicts.

Table 9-3: Machinery associated with proposed activities and corresponding noise values

Plant Item	Ref	dB(A) @10m	dB(A) @- 100m	dB(A) @ 200m	dB(A) @ 300m	dB(A) @ 500m
Dozer	BS 5228-1	75	55	49	45	21
Excavator	BS 5228-1	75	55	49	45	21

Table 9-3 details the noise emissions from the plant items to be used in the Proposed Development and the relevant LA_{eq} values at the reference distances. The closest noise

sensitive locations, NSL4, NSL5 and NSL6 are located approximately 250 metres from the proposed operational site. The predicted noise levels at 250m from the proposed activities are detailed in Table 9-3. There is a predicted noise level of 45dB(A)@250m which is within the recommended daytime noise level of 55dB(A). Therefore, daytime noise limits for a non-quiet area will not be exceeded at this location as a result of plant machinery.

Due to the nature of the proposed operations, there is no continuous noise source associated with the importation of soils to the site. The occasional trucks intermittently entering and leaving the site and the tipping of soils and subsoils will result in intermittent noise being generated at the Proposed Development. The levels of noise generated as a result of these activities will not be continuous.

9.5.4 Potential Cumulative Impacts

Cumulative Impacts can be defined as "impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project". Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the cumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

A review of other off-site developments and proposed developments was completed as part of this environmental assessment. It is not expected that the Proposed Development will result in cumulative impacts with any existing or proposed offsite projects.

9.5.5 "Do Nothing" Impact

A do-nothing scenario would result in the site remaining undeveloped. Noise and vibration levels would remain unchanged onsite and at nearby sensitive receptors.

9.6 Avoidance, Remedial & Mitigation Measures

9.6.1 Operational Phase

In order to control likely noise impacts caused by the proposed operations, mitigation measures as set out in *BS 5228-1: A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise* can be adopted;

- Selection of plant with low inherent potential for generating noise.
- Siting of plant as far away from sensitive receptors as permitted by site constraints.
- Avoid unnecessary revving of engines and switch off plant items when not required.
- Keep plant machinery and vehicles adequately maintained and serviced.
- Proper balancing of plant items with rotating parts.
- Keep internal routes well maintained and avoid steep gradients.
- Minimise drop heights for materials or ensure a resilient material underlies.
- Use of alternative reversing alarm systems on plant machinery.
- Where noise becomes a source of resonating body panels and cover plates, additional stiffening ribs or materials should be safely applied where appropriate.

- Limiting the hours during which site activities likely to create high levels of noise are permitted
- Appointing a site representative responsible for matters relating to noise
- Monitoring typical levels of noise during critical periods and at sensitive locations

9.6.2 "Worst Case" Scenario

The worst-case scenario where mitigation measures fail for the Proposed Development, it is considered that localised noise nuisances may arise. This is considered highly unlikely and indeterminable.

9.7 Residual Impacts

Residual Impacts are defined as 'effects that are predicted to remain after all assessments and mitigation measures'. They are the remaining 'environmental costs' of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts.

Potential residual impacts from the Proposed Development were considered as part of this environmental assessment.

No residual impacts are anticipated.

9.8 Monitoring

9.8.1 Operational Phase

The Proposed Development will be subject to a Waste Facility Permit (WFP) from Kildare County Council. The operator will comply with the noise monitoring requirements as per the conditions of the WFP. Based on the quiet area screening as detailed in Section 0 of this Chapter, the following noise limits will be complied with:

Scenario	Daytime Noise Criterion, dB L _A ,T (07:00 to 19:00hrs)	Evening Noise Criterion, dB L _A ,T (19:00 to 23:00hrs)	Night-time Noise Criterion, dB L _A eq,T (23:00 to 07:00hrs)
Proposed Noise Limits for the Proposed Development	55dB	50dB	45dB

9.9 Interactions

9.9.1 Population and Human Health

The impact assessment of noise and vibration has concluded that additional noise associated with the operation of on-site machinery will be intermittent and will not create any major negative impacts beyond the site boundary. Mitigation and monitoring measures will be incorporated to further reduce the potential for noise generation from the Proposed Development.

It is noted that specific issues relating to Population and Human Health associated with the Proposed Development are set out in Chapter 4 of this EIAR.

9.9.2 Biodiversity

It is not considered that the Noise and Vibration effects of the Proposed Development will have an adverse impact on biodiversity in the local area. While the proposed Construction Phase will result in a temporary increase in noise and vibration, it is considered that this will not cause a significant disturbance to the local fauna including birds due to the existing established urban environment.

9.9.3 Traffic

Both the Construction Phase and the Operational Phase of the Proposed Development are expected to generate a limited number of traffic movements on the local road network as outlined in Chapter 12, Section 12.1 Traffic. The Chapter provides a robust assessment by assuming the worst-case scenario of HGV movements were day and a conservative estimate for visitor trips to the site. The impact of noise from operational traffic will be unnoticeable and will not have a negative impact.

9.10 Difficulties Encountered When Compiling

No difficulties were encountered when compiling this Chapter.

9.11 References

Design Manual for Roads and Bridges Volume 11 Section 3 Part 7 (HD 213/11 – Revision 1) (The Highways Agency et al., 2011);

BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise.

ISO 1996-1:2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures

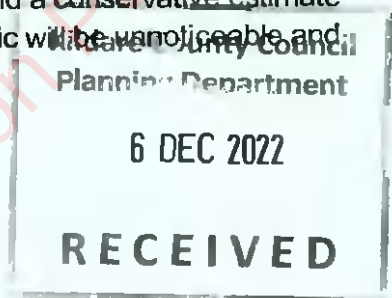
ISO 1996-2:2017 Acoustics - Description, measurement and assessment of environmental noise Part 2: Determination of sound pressure levels

ISO 9613-1:1993 Acoustics - Attenuation of sound during propagation outdoors -- Part 1: Calculation of the absorption of sound by the atmosphere

ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors -- Part 2: General method of calculation

Environmental Protection Agency (2016) Guidance Note for Noise (NG4): Licence Applications, Surveys and Assessments in Relation to Scheduled Activities.

Guidelines for the Treatment of Noise & Vibration in National Road Schemes, National Roads Authority, Revision 1, 25th October 2004



10 LANDSCAPE AND VISUAL ASSESSMENT

10.1 Introduction

This Landscape and Visual Impact Assessment Chapter has been prepared in respect of an application by PJ Doran for the importation of material to in-fill and re-contour the site at Thomastown, Johnstown Bridge, Co. Kildare.

This Chapter assesses the effects of the Proposed Development on the landscape and visual amenities of the area and details the potential direct and indirect effects of the Proposed Development on landscape fabric, character and quality, and the resulting impact on visual amenity.

The aim of a landscape and visual assessment is to identify the elements of the landscape which make it unique and the extent to which it is possible to alter these landscapes before unacceptable consequences arise. Landscape character represents the individuality of an area based on its particular combination of features and elements. The purpose of this assessment is to evaluate the existing landscape character of the site and surroundings, to assess the visual impact of the Proposed Development and to identify landscape designations and planning policies that may concern the Proposed Development site and its environs.

Landscape Impact Assessment (LIA) relates to assessing effects on the landscape as a resource in its own right and is concerned with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character.

Visual Impact Assessment (VIA) relates to assessing effects on specific views and on the general visual amenity experienced by people. This deals with how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements. Visual effects may occur from: Visual Obstruction (blocking of a view, be it full, partial or intermittent) or; Visual Intrusion (interruption of a view without blocking).

Cumulative landscape and visual impact assessment is concerned with additional changes to the landscape or visual amenity caused by the Proposed Development in conjunction with other developments, or actions that occurred in the past, present or are likely to occur in the foreseeable future.

10.1.1 Quality Assurance and Competence

This Chapter was prepared by Enviroguide Environmental Consultant Nuno Costa. Nuno has a M.Sc. in Landscape Architecture from *University of Porto*, a Postgraduate Diploma in Advanced Studies in Territory, Environment and Sustainable Development from *Nova University Lisbon*, and is a PhD student in Landscape Architecture and Urban Ecology. Nuno has 13 years professional experience as a Landscape Architect.

10.2 Methodology

This section sets out the methodology for the LVA as result of the Proposed Development.

10.2.1 Guidelines and other information used in the LVA

The assessment has been undertaken in accordance with best practice, legislation and guidance notes. The methodology used is based on the Environmental Protection Agency Documents: Environmental Protection Agency (EPA) Guidelines on the Information to be contained in Environmental Impact Assessment Report (2022), and their precursor *The Guidelines on the Information to be contained in Environmental Impact Statements (2002)* and *Advice notes on current practise in the praparation of Environmental Impact Statements (2003)*. It is also based on the Department of the Environment, Heritage and Local Governments Document; *Architectural Heritage Protection, Guidelines for Planning Authorities, 2004* and the Landscape Institute and Institute of Environmental Management & Assessment Document *Guidelines for Landscape and Visual Impact Assesmant (2013)*.

The aforementioned documents recommend baseline studies to describe, classify and appraise the existing landscape and visual properties, focusing on any sensitive receptors in the area and the ability of the landscape to accommodate the Proposed Development changes that will occur at the Proposed Development site. This is established through a collective process of desktop study and onsite survey work. Once the baseline conditions are established it allows for the identification of impacts, and an assessment of their magnitude and significance on the landscape character and visual amenities of the area.

A judgement on the sensitivity of the landscape is made from a combination of the susceptibility of the landscape to development, and therefore change, and the value attached to that landscape. This is determined by way of existing designations, both legislative and non-legislative for scenic beauty, landscape quality, recreational value, significant importance, rarity etc. Visual sensitivity is determined by a combination of judgements about the susceptibility of visual receptors such as dwellings, roads, scenic spots etc. to changes in visual amenity and the value attached to these views. The *Guidelines for Landscape and Visual Impact Assessment* state that the aim is "to establish the area in which the development will be visible, the differant groups of people who may experience views of the development, the places where they will be affected and the nature of the views and visual amenity at those points".

The assessment of the landscape and visual impacts for this development was informed by the guidance documents indicated on the References Chapter. However, documents: "*Kildare County Development Plan 2017-2023*" and "*The Landscape Institute, 'Guidelines for Landscape and Visual Impact Assessment', (3rd Edition) 2013*" had a special relevance in this analysis.

10.2.2 Desktop Study

The desktop study comprised the following:

- Establishing an appropriate Study Area from which to study the landscape and visual effects of the Proposed Development;

- Review of Viewsheds, which indicates areas from which the Development is potentially visible in relation to terrain within the Study Area;
- Review of relevant County Development Plans, particularly with regard to sensitive landscape and scenic view/route designations;
- Selection of potential Viewshed Reference Points (VRPs) from key visual receptors to be investigated during fieldwork for actual visibility and sensitivity.

10.2.3 Fieldwork

Site visits were carried out at various times in order to:

- Select a refined set of VRP's for assessment.
- Record a description of the landscape elements and characteristics within the Study Area generally and also within view from each VRP.
- Capture high quality base photography from which to prepare photomontages of the proposal.

10.2.4 Landscape and Visual Assessment Criteria

The assessment of landscape and visual effects involves a description of the geographic location and landscape context of the Proposed Development as well as a general landscape description concerning essential landscape character and salient features of the wider Study Area. This is discussed with respect to: landform and drainage; vegetation and land use; centres of population and houses; transport routes and; public amenities and facilities. Consideration of design guidance, the planning policy context and relevant landscape designations are also considered.

Once the baseline environment was established, an assessment of the likely potential significant effects associated with the Proposed Development was carried out. This included the following:

- Appraisal of salient landscape character.
- Appraisal of predicted landscape effects.
- Appraisal of predicted visual Viewsheds maps as well as photomontages prepared from selected VRP locations.
- Appraisal of predicted cumulative effects.
- Discussion of mitigation measures.
- Assessment of residual effects following mitigation.

10.2.5 Assessment of Effects

The landscape and visual impact assessment seeks to identify, predict and evaluate the significance of potential effects to landscape characteristics and established views. The assessments are based on an evaluation of the sensitivity to change and the magnitude of change for each landscape or visual receptor. The assessment acknowledges that landscape and visual effects change over time as the existing landscape evolves and proposed planting establishes and matures. The assessment therefore reports on potential effects during both the construction phase and the operational phase of the Proposed Development. The prominence of the Proposed Development in the landscape or view will vary according to the existing screening effects of local topography, structures and buildings, intervening existing vegetation and type and height of the proposed structures.

10.2.5.1 Landscape Effects

Landscape effects describe the impact on the fabric or structure of a landscape or landscape character. The assessment of landscape effects firstly requires the identification of the components of the landscape. The landscape components are also described as landscape receptors and comprise the following: Individual landscape elements or features; Specific aesthetic or perceptual aspects; and Landscape character, or the distinct, recognisable and consistent pattern of elements (natural and man-made) in the landscape that makes one landscape different from another. The assessment will identify the interaction between these components and the Proposed Development during construction and operational phases. The condition of the landscape and any evidence of current pressures causing change in the landscape will also be documented and described.

Landscape Value

Landscape value is frequently addressed by reference to international, national, regional and local designations, determined by statutory and planning agencies. However, absence of such a designation does not necessarily imply a lack of quality or value. Factors such as accessibility and local scarcity can render areas of nationally unremarkable quality, highly valuable as a local resource. The quality and condition is also considered in the determination of the value of a landscape. The evaluation of landscape value is undertaken with reference to the definitions stated in Table 10-1.

Table 10-1: Landscape Sensitivity Criteria

Landscape Value	Classification Criteria
High	Nationally designated or iconic, unspoilt landscape with few, if any, degrading elements.
Medium	Regionally or locally designated landscape, or an undesignated landscape with locally important landmark features and some detracting elements.
Low	Undesignated landscape with few if any distinct features or with several degrading elements.

The landscape of the site of the Proposed Development is considered to have a Medium Landscape Value.

Landscape Susceptibility

Landscape susceptibility relates to the ability of a particular landscape to accommodate the Proposed Development. Landscape susceptibility is appraised through consideration of the baseline characteristics of the landscape, and in particular the scale or complexity of a given landscape. The evaluation of landscape susceptibility is undertaken with reference to a three-point scale, as outlined in Table 10-2:

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Table 10-2: Landscape Susceptibility Criteria

Landscape Susceptibility	Classification Criteria
High	Small scale, intimate or complex landscape considered to be intolerant of even minor change.
Medium	Medium scale, more open or less complex landscape considered tolerant to some degree of change.
Low	Large scale, simple landscape considered tolerant of a large degree of change.

The landscape of the site of the Proposed Development is considered to have a Medium Landscape Susceptibility.

Landscape Sensitivity

Landscape sensitivity to change is determined by employing professional judgment to combine and analyse the identified landscape value, quality and susceptibility and is defined with reference to the scale outlined in Table 10-3:



Table 10-3: Landscape Sensitivity Criteria

Class	Criteria
High	Landscape characteristics or features with little or no capacity to absorb change without fundamentally altering their present character. Landscape designated for its international or national landscape value or with highly valued features. Outstanding example in the area of well cared for landscape or set of features that combine to give a particularly distinctive sense of place. Few detracting or incongruous elements
High-Medium	Landscape characteristics or features with a low capacity to absorb change without fundamentally altering their present character. Landscape designated for regional or county-wide landscape value where the characteristics or qualities that provided the basis for their designation are apparent. Good example in the area of reasonably well cared for landscape with notable landscape features.
Medium	Landscape characteristics or features with moderate capacity to absorb change without fundamentally altering their present character. Landscape designated for its local landscape value or a regional designated landscape where the characteristics and qualities that led to the designation of the area are less apparent or are partially eroded or an undesignated landscape which may be valued locally – for example an important open space. An example of a landscape or a set of features which is neutral or mixed character.
Medium - Low	Landscape characteristics or features which are reasonably tolerant of change without detriment to their present character. No landscape designation present or of medium to low local value, or an example of a common or un-stimulating landscape or set of features and conditions.
Low	Landscape characteristics or features which are tolerant of change without detriment to their present character. No designation present or of low local value. An example of monotonous unattractive visually conflicting or degraded landscape or set of features.

The landscape of the site of the Proposed Development is considered to have a Medium-Low Landscape Sensitivity.

Magnitude of Landscape Change

Magnitude of change is an expression of the size or scale of change in the landscape, the geographical extent of the area influenced and the duration and reversibility of the resultant effect. The variables involved are described below:

- The extent of existing landscape elements that will be lost, the proportion of the total extent that this represents and the contribution of that element to the character of the landscape;

- The extent to which aesthetic or perceptual aspects of the landscape are altered either by removal of existing components of the landscape or by addition of new ones;
- Whether the effect changes the key characteristics of the landscape, which are integral to its distinctive character;
- The geographic area over which the landscape effects will be felt (within the Project Development site itself; the immediate setting of the Project Development site; at the scale of the landscape type or character area; on a larger scale influencing several landscape types or character areas); and
- The duration of the effects (short term, medium term or long term) and the reversibility of the effect (whether it is permanent, temporary or partially reversible).

Changes to landscape characteristics can be both direct and indirect. Direct change occurs where the Proposed Development will result in a physical change to the landscape within or adjacent to the Project Development site. Indirect changes are a consequence of the direct changes resulting from the Proposed Development. They can often occur away from the Proposed Development site (for example, off-site construction staff parking) and may be a result of a sequence of interrelationships or a complex pathway (for example, a new road or footpath construction may increase public access and associated problems e.g. littering). They may be separated by distance or in time from the source of the effects.

The magnitude of change affecting the baseline landscape resource is based on an interpretation of a combination of the criteria set out in Table 10-4.



Table 10-4: Magnitude of Landscape Change Criteria

Magnitude of Landscape Change	Classification Criteria
None	Landscape characteristics or features with little or no capacity to absorb change without fundamentally altering their present character. Landscape designated for its international or national landscape value or with highly valued features. Outstanding example in the area of well cared for landscape or set of features that combine to give a particularly distinctive sense of place. Few detracting or incongruous elements
Negligible	Landscape characteristics or features with a low capacity to absorb change without fundamentally altering their present character. Landscape designated for regional or county-wide landscape value where the characteristics or qualities that provided the basis for their designation are apparent or a landscape with highly valued features locally. Good example in the area of a well-cared for landscape or set of features that combine to give a clearly defined sense of place.
Low	Landscape characteristics or features which are reasonably tolerant of change without detriment to their present character. No designation present or of little local value. An example of an un-stimulating landscape or set of features; with some areas lacking a sense of place and identity.
Medium	Noticeable change, affecting some key characteristics and the experience of the landscape; and Introduction of some uncharacteristic elements
High	Noticeable change, affecting many key characteristics and the experience of the landscape; and Introduction of many incongruous developments
Very High	Highly noticeable change, affecting most key characteristics and dominating the experience of the landscape; and Introduction of highly incongruous development

It's considered that the Proposed Development changes to landscape characteristics are Medium to High.

10.2.5.2 Visual Effects

Visual effects are determined by the extent of visibility and the nature of the visibility (i.e. how a development is seen within the landscape); for example, whether it appears integrated and balanced within the visual composition of a view or whether it creates a focal point. Negative visual effects may occur through the intrusion of new elements into established views, which are out of keeping with the existing structure, scale and composition of the view. Visual effects may also be beneficial, where an attractive focus is created in a previously unremarkable view.

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or the influence of previously detracting features is reduced. The significance of effects will vary, depending on the nature and degree of change experienced and the perceived value and composition of the existing view.

Receptors

For there to be a visual impact, there is the need for a viewer. Views experienced from locations such as settlements, recognised routes and popular vantage points used by the public have been included in the assessment. Receptors are the viewers at these locations. The degree to which receptors, i.e. people, will be affected by changes as a result of the Proposed Development depends on a number of factors.

Value of the View

Value of the view is an appraisal of the value attached to views and is often informed by the appearance on Ordnance Survey of tourist maps and in guidebooks, literature or art. Value can also be indicated by the provision of parking or services and signage and interpretation. The nature and composition of the view is also an indicator. The value of the view is determined with reference to the definitions outlined in Table 10-5:

Table 10-5: Value of the View

Value	Classification Criteria
High	Nationally recognised view of the landscape, with no detracting elements.
Medium	Regionally or locally recognised view, or unrecognised but pleasing and well composed view, with few detracting elements.
Low	Typical or poorly composed view often with numerous detracting elements.

Visual Susceptibility

The GLVIA guidelines identify that the susceptibility of visual receptors to changes in views and visual amenity is a function of:

- The occupation or activity of people experiencing the view at a particular location; and
- The extent to which their attention or interest may therefore be focused on the views and visual amenity they experience at particular locations.

For example, residents in their home, walkers whose interest is likely to be focused on the landscape or a particular view, or visitors at an attraction where views are an important part of the experience often indicate a higher level of susceptibility. Whereas receptors occupied in outdoor sport, where views are not important, or at their place of work, are often considered less susceptible to change. Visual susceptibility is determined with reference to the three-point scale and criteria outlined in Table 10-6.

Table 10-6: Visual Susceptibility

Susceptibility	Classification Criteria
High	Receptors for which the view is of primary importance and are likely to notice even minor change.
Medium	Receptors for which the view is important but not the primary focus and are tolerant of some change.
Low	Receptors for which the view is incidental or unimportant and is tolerant of a high degree of change.

Visual Sensitivity

Sensitivity to change considers the nature of the receptor; for example, a person occupying a residential dwelling is generally more sensitive to change than someone working in a factory unit. The importance of the view experienced by the receptor also contributes to an understanding of the susceptibility of the visual receptor to change as well as the value attached to the view. A judgement is also made on the value attached to the views experienced. This takes account of:

- Recognition of the value attached to particular views, for example in relation to heritage assets, or through planning designations;
- Indicators of the value attached to views by visitors, for example through appearance in guidebooks or on tourist maps, provision of facilities for their enjoyment (sign boards, interpretive material) and references to them in literature or art; and
- Possible local value: it is important to note that the absence of view recognition does not preclude local value, as a view may be important as a resource in the local or immediate environment due to its relative rarity or local importance.

The visual sensitivity to change is based on interpretation of a combination of all or some of the criteria outlined in Table 10- 7:



Table 10-7 Visual Sensitivity

Visual Sensitivity	Criteria
High	Users of outdoor recreational facilities, on recognised national cycling or walking routes or in national designated landscapes. Dwellings with views orientated towards the Proposed Development.
High Medium	Users of outdoor recreational facilities, in locally designated landscapes or on local recreational routes that are well publicised in guide books. Road and rail users in nationally designated landscapes or on recognised scenic routes, likely to be travelling to enjoy the view.
Medium	Users of primary transport road network, orientated towards the Development, likely to be travelling for other purposes than just the view. Dwellings with oblique views of the Proposed Development.
Medium Low	People engaged in active outdoor sports or recreation and less likely to focus on the view. Eg: outdoor workers – agriculture, horticulture Primary transport road network and rail users likely to be travelling to work with oblique views of the Development or users of minor road network.
Low	People engaged in work activities indoors, with limited opportunity for views of the Development.

Magnitude of Visual Change

Visual effects are direct effects as the magnitude of change within an existing view will be determined by the extent of visibility of the Proposed Development. The magnitude of the visual effect resulting from the development at any particular viewpoint or receptor is based on the size or scale of change in the view, the geographical extent of the area influenced and its duration and reversibility. The variables involved are described below:

- The scale of the change in the view with respect to the loss or addition of features in the view and changes in its composition, including the proportion of the view occupied by the development;
- The degree of contrast or integration of any new features or changes in the landscape form, scale, mass, line, height, skylining, back-grounding, visual clues, focal points, colour and texture;
- The nature of the view of the Proposed Development, in relation to the amount of time over which it will be experienced and whether views will be full, partial or glimpses;
- The angle of view in relation to the main activity of the receptor, distance of the viewpoint from the development and the extent of the area over which the changes will be visible; and
- The duration of the effects (short term, medium term or long term) and the reversibility of the effect (whether it is permanent, temporary or partially reversible).

The magnitude of visual effect resulting from the development at any particular viewpoint or receptor is based on the interpretation of the above range of factors and is set out in Table 10-8:

Table 10-8 Magnitude of Visual Change (Visual effects)

Magnitude	Criteria
Very High	The development will cause significant changes in the existing view over a wide area or a change which will dominate over a limited area.
High	The development will cause a considerable change in the existing view over a wide area or a significant change over a limited area.
Medium	The development will cause modest changes to the existing view over a wide area or noticeable change over a limited area.
Low	The development will cause very minor changes to the view over a wide area or minor changes over a limited area.
Negligible	The development will cause a barely discernible change in the existing view.
None	No change in the existing view.

10.2.6 Duration and Quality of Effects

Table 10-9 provides the definition of the duration of landscape and visual effects:

Table 10-9 Definition of the duration of landscape and visual effects

Duration	Description
Temporary	Impacts lasting one year or less
Short-term	Impacts lasting one to seven years
Medium-term	Impacts lasting seven to twenty years
Long-term	Impacts lasting twenty to fifty years
Permanent	Impacts lasting over fifty years

The quality of both, landscape and visual effects, can be Beneficial (Positive), Adverse (Negative) or Neutral according to the definitions set out in Table 10- 10 :

Table 10-10 Definition of Quality of Effects

Class	Criteria
Beneficial:	A positive impact which will improve or enhance the landscape character or viewpoint.
Neutral	A neutral impact which will neither enhance nor detract from the landscape character or viewpoint.
Negative	A negative impact which will detract from the existing landscape character or viewpoint.

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10.2.7 Significance Criteria

The objective of the assessment process is to identify and evaluate the potentially significant effects arising from the Proposed Development. The assessment will identify the residual effects likely to arise from the finalised design taking into account mitigation measures and the change over time. The significance of effects is assessed by considering the sensitivity of the receptor and the predicted magnitude of effect in relation to the baseline conditions. In order to provide a level of consistency and transparency to the assessment and allow comparisons to be made between the various landscape and visual receptors subject to assessment, the assessment of significance is informed by pre-defined criteria as outlined in Table 10-11. When assessing significance, individual effects may fall across several different categories of significance and professional judgement is therefore used to determine which category of significance best fits the overall effect to a landscape or visual receptor. The significance of the effects can be adverse (negative) or beneficial (positive) according to the definitions set out in Table 10- 11:



Table 10-11 Categories of Significance of Landscape and Visual Effects

Impact Magnitude	Definition
Imperceptible Impact:	An impact capable of measurement but without noticeable consequences
Minor Impact:	An impact which causes noticeable changes in the character of the environment without affecting its sensitivities
Moderate Impact:	An impact that alters the character of the environment in a manner that is consistent with the existing and emerging trends
Significant Impact:	An impact which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
Profound Impact:	An impact which obliterates sensitive characteristics

10.2.8 Study Area

Due to the scale and nature of the Proposed Development within this receiving landscape setting, it is anticipated that the Proposed Development is not likely to give rise to significant landscape or visual impacts beyond approx. 1km. However, out of an abundance of caution, a 3.0km-radius study area is used in this instance.

As one moves away from any type of development in the landscape, it will become less perceptible with distance. It is common practice to consider the viewpoint distance as laid out in Table 10-12 Viewpoint Distance.

Table 10-12 identifies and describes the impact of a viewpoint and the distances associated with these visual impacts.

Table 10-12 Viewpoint Distance

Viewpoint Distance	Description
0-2km	It is generally accepted that a development located approximately 2km or less from a viewer would be close enough to allow identification of significant detail. Any positions within this range with open uninterrupted views of a development would generally receive the greatest visual impacts.
2-5km	At this distance, visibility of a development site becomes more general, with viewers in open uninterrupted positions able to identify general form, colour/tone and textural contrast, but losing the more focused detail achievable from closer positions. Impacts at this distance are generally less than those found between 0-2km.
5-10km	Beyond 5km visual prominence quickly diminishes. Certain circumstances/light conditions etc. have potential to allow certain types of development and material finishes to be perceived. The development increasingly becomes part of the general background/distance views. Upwards of 15km distance, developments quickly become minor features within the landscape and considered imperceptible to the average human eye. The impact of the development diminishes as the developments becomes part of the general background/distance views.

10.2.9 Viewsheds

To confirm the study area, Viewsheds were defined in 4 different points of the property (V1-V4), as it can be seen in the Figure 10-1. These Viewsheds were processed using Google

Earth Pro software, that adjusted the view of the observer 2.00 meters above the terrain. In green, on the images, it can be seen the visibility from the points considered.

As can be seen from Figures 10-2 to 10-5, visibility is very limited to north of the M4, west of the L1003, east of Johnstown Bridge/R402 and south of Kilshanroe.



Figure 10-1: Location of Viewsheds



Figure 10-2: Viewshed V1. Viewing altitude: 10.0 km





Figure 10-3: Viewshed V2. Viewing altitude: 10.0 km

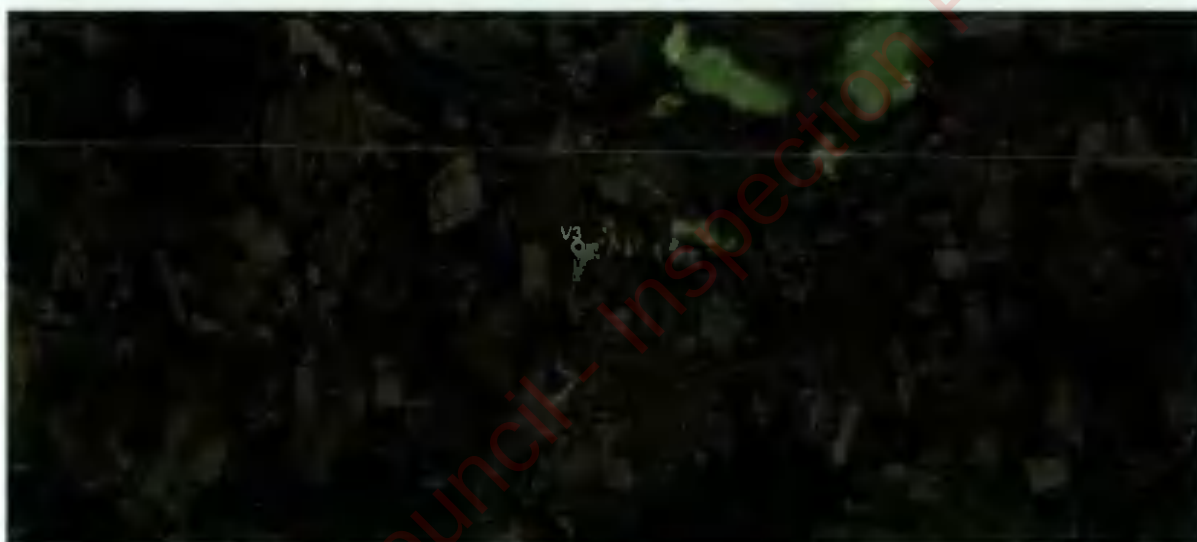


Figure 10-4: Viewshed V3. Viewing altitude: 10.0 km



Figure 10-5: Viewshed V4. Viewing altitude: 10.0 km

10.2.10 Potential Receptors

Following the production of the Viewsheds and field study, the following possible receptors of impacts were noted.

10.2.10.1 *Dwellings with views orientated towards the development*

Dwellings with views orientated towards the development are generally accepted as having a high visual sensitivity.

The access road to the Proposed Development originates from L5014, to the south. This road has dwellings on both sides.

To the south of the Proposed Development there are 4 dwellings that directly overlook the site and are located just 200 meters.

To the northeast of the site is the settlement, with the nearest dwelling being about half a mile from the site (northeast limit of this village).

10.2.10.2 *Road / transport users*

Users of the main roads around the Proposed Development are generally accepted as having medium to low visual sensitivity.

A road, that only serves to access the site, with about 250 meters extension, originates from the L5014 and links to the southwest corner of the site.

L504 connects to L1003 (about 2km west) and the R402 (about 500 meters east). The M4 is about 800 meters north, from the southern limit of the site.

10.2.10.3 *Indoor workers*

People engaged in work activities indoors, with limited opportunity for views of the development are generally accepted as having a low visual sensitivity.

Workers from "Max Pallets", "Colm Brady Hair" and in a minor scale "Applegreen Enfield", close to the M4, can be included in this category of potential receptors.

10.2.10.4 *Farmers*

Agricultural workers from properties on the periphery of the development, with a medium visual sensitivity.

10.3 The Existing and Receiving Environment (Baseline Situation)

10.3.1 Site Context

The Proposed Development is situated in the townland of Thomastown, Co. Kildare. Kildare is situated in the Irish midlands located in the province of Leinster. The Proposed Development has a total area of 7.243 ha (17.898 acres) and lies at or slightly below the level of the public road. Johnstown Bridge village is located ca. 1.5km to the east of the site and the village of Kilshanroe is 1.80 km to the south-west. The setting is predominantly rural with surrounding land uses of agriculture, forestry and a number of one-off residential dwellings and one-off commercial type facilities.

The entrance to the Proposed Development is located along an L5014, just off the R 402. The site is located approximately 2.5km from junction 9 on the M4 motorway.



Figure 10-6: Aerial view with the Proposed Development outlined in red in its broader landscape context. Viewing altitude: 12.00 km. Source: Google Earth

- 1 – M4
- 2 – L1003
- 3 – R402
- 4 – Thomastown
- 5 – Martinstown

- 6 – Johnstown Bridge
- 7 – Kilwarden
- 8 – Kilshanroe
- 9 – Royal Canal
- 10 – Train line

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10.3.2 Landscape Character Assessment (LCA)

A Landscape Character Assessment (LCA) for County Kildare was undertaken as part of the Kildare County Development plan 2017-2023. This assessment focussed on *"the discernment of the character of the landscape based on its land cover and landform, but also on its values, such as historical, cultural, religious and other understandings of the landscape. It concentrates on the distinctiveness of different landscapes and on the sensitivity of that landscape to development"*. This assessment divided the county into eight broad scale Landscape Character Areas:

- North Western Lowlands;
- Northern Lowlands;
- Central Undulating Lands;
- Western Boglands;
- Southern Lowlands;
- Eastern Transition;
- Eastern Uplands; and
- South-Eastern Uplands

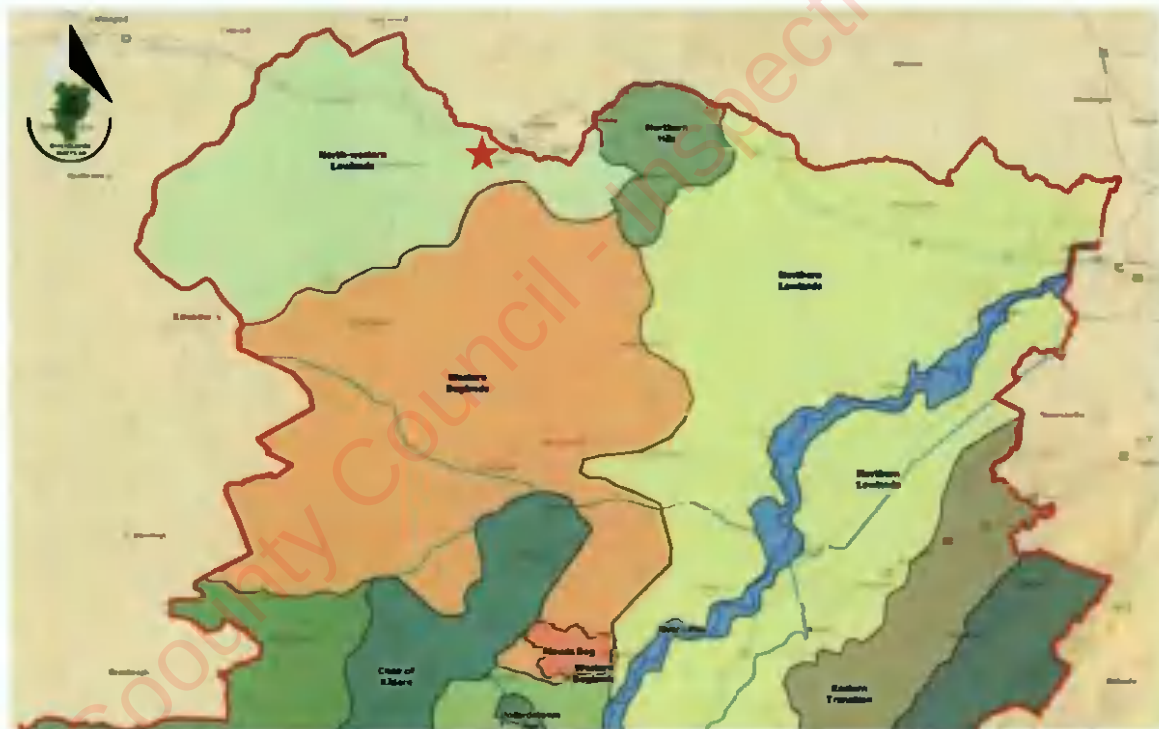


Figure 10-7: Extract of Landscape Character Areas (Kildare County Development Plan 2017-2023). Proposed Development site marked with a star

The Proposed Development is located in the area classified as North-Western Lowlands (Figure 10-7) which was designated as Class 1 – Low Sensitivity.

The North-Western Lowlands were classified as being of 'High' compatibility with Forestry, Housing, Urbanisation, Infrastructure, Extraction and Energy and of being 'Most' compatible with Agriculture.

Figure 10-8 outlines the landscape sensitivity in Kildare County. The sensitivity of a landscape receptor can be defined as the vulnerability to change it may experience. Landscape receptors can be considered the physical or natural resource, special interest or viewer group that will experience an impact. This Class-1 designation refers to "Areas with the capacity to generally accommodate a wide range of uses without significant adverse effects on the appearance or character of the area".

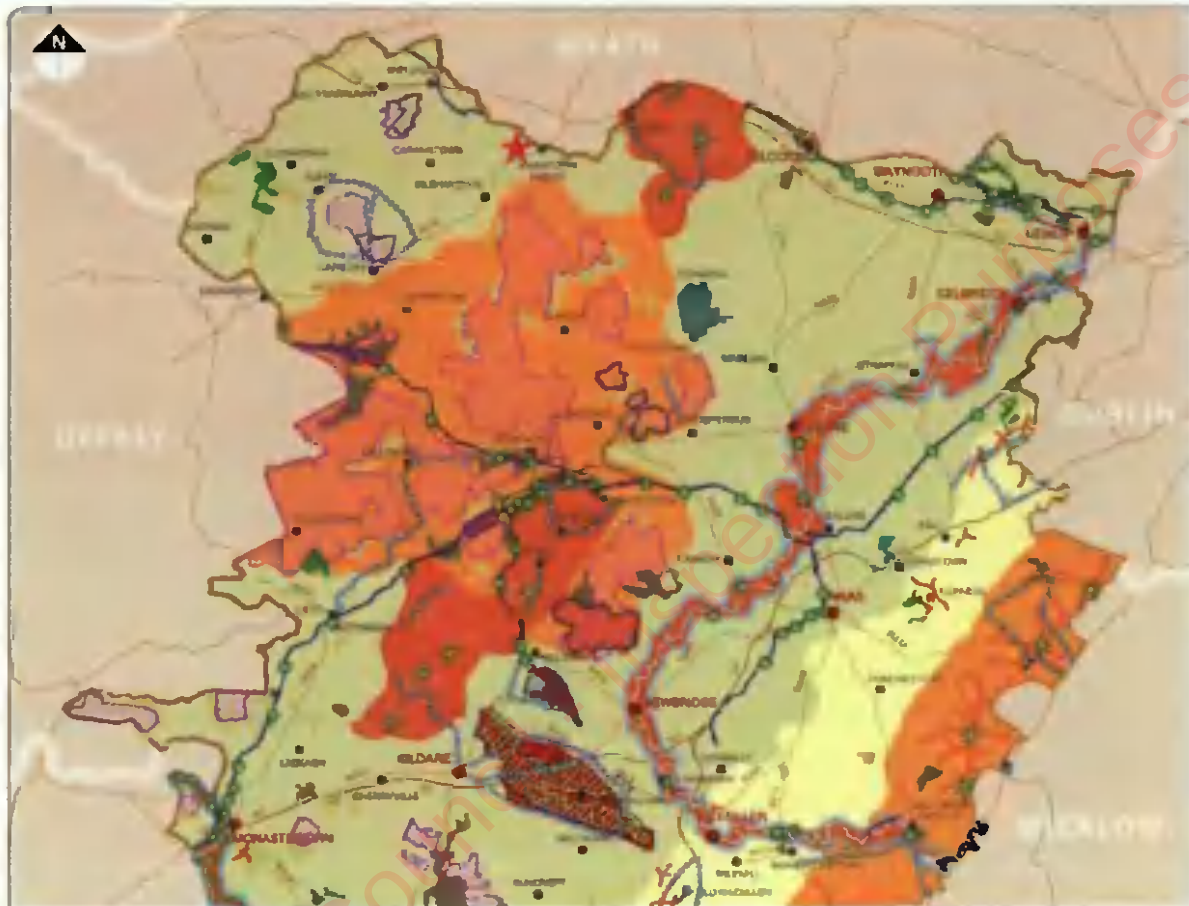


Figure 10-8: Landscape Sensitivity Areas (Kildare County Development Plan 2017-2023). Proposed Development site marked with a star

In relation to the general objectives that the Council states the following are worth noting:

LR 01 Ensure that consideration of landscape sensitivity is an important factor in determining development uses. In areas of high landscape sensitivity the design, type and the choice of location of the Proposed Development in the landscape will be critical considerations.

LR 02 Require a Landscape/Visual Impact Assessment to accompany proposals that are likely to significantly affect:

- Landscape Sensitivity Factors;
- A Class 4 or 5 Sensitivity Landscape (i.e. within 500m of the boundary);
- A route or view identified in Map 13-2 or Map 13-3 (i.e. within 500m of the site boundary).

- All Wind Farm development applications irrespective of location, shall be required to be accompanied by a detailed Landscape/Visual Impact Assessment including a series of photomontages at locations to be agreed with the Planning Authority, including from scenic routes and views identified in Chapter 13.

LR O3 Require all Landscape and Visual Impact Assessments of specified linear infrastructure projects to be undertaken in line with the guidance on best practice methodology of the TII publication Landscape Character Assessment (LCA) and Landscape and Visual Impact Assessment (LVIA) of Specified Infrastructure Projects (2020).

LR O4 Ensure that local landscape features, including historic features and buildings, hedgerows, shelter belts and stone walls, are retained, protected and enhanced where appropriate, so as to preserve the local landscape and character of an area, whilst providing for future development.

LR O5 Preserve, where appropriate, the open character of commonage.

LR O6 Investigate the feasibility of preparing a Landscape Conservation Area Assessment within the county to identify any area(s) or place(s) within the county as a Landscape Conservation Area, in accordance with the Planning and Development Act 2000 (as amended).

LR O7 Restrict the quarrying of sensitive sites within the Landscape Character Areas in line with Table 13-3 and Table 13-4 above and to protect and conserve the ecological, archaeological, biodiversity and visual amenity surrounding quarry sites.

LR O8 Ensure that all quarrying activities and projects associated with the extractive industry comply with all relevant Planning and Environmental Legislation and the Guidelines for the Protection of Biodiversity within the Extractive Industry document 'Wildlife, Habitats & the Extractive Industry'.

LR O9 Continue to support development that can utilise existing structures, settlement areas and infrastructure, whilst taking account of local absorption opportunities provided by the landscape, landform and prevailing vegetation.

LR O10 Recognise that the lowlands and the transitional area are made up of a variety of working landscapes, which are critical resources for sustaining the economic and social well-being of the county and include areas of significant landscape and ecological value, which are worthy of protection.

(Source Kildare County Development Plan 2017-2023, Chapter 13: Landscape, Recreation & Amenity).

10.3.3 Scenic Routes and Viewpoints

Scenic routes and protected views can be considered views of importance and value within the County.

There are no designated scenic routes or protected views located within the vicinity of the site or within the wider vicinity of Thomastown. Figure 10-9 illustrates part of the scenic routes, hilltop views and scenic viewpoints within the County.



Figure 10-9: Scenic routes and viewpoints near project site (Kildare County Development Plan 2017-2023). Proposed Development site marked with a star

These are the closest protected views to the site:

Protected View 15: Views of the Plains of Kildare and West Central Boglands, to and from Newtown Hills (including county roads L5027, L50281, L5028, L1007).

The closest point to the site is the most northwest section of this route, which is still almost 6 km from the site, at the intersection with the R148.

There is no visibility for the site.

Protected View 26: The views and scenic routes closest to the site are the following: Views from the county roads (L1005, L5019, L5018, L1006, L5017 and L5011) of Carbury Castle and Hill – Teelough road junction with the R402 and upland area at Mylerstown.

The closest point to the site turns out to be the most southeast section of this route, which is still almost 5 km from the site, at the intersection with the R402.

There is no visibility for the site.

10.3.4 Landscape Capacity of the site

The Proposed Development site is inserted in a rural context, and well delimited by hedgerows in almost all of its periphery, as can be seen in Figure 10-10.



Figure 10-10: Existing Situation – Aerial View



Figure 10-11: Existing Situation – Drone Photo, from the southeast part of the site.

As can be seen in Figure 10-11, there is a flaw in the hedgerow in the south-eastern limit. There are some patches of vegetation in the centre of the site. There are also hedgerows that bordered the access roadway, on both sides.

The site is mostly composed of spontaneous herbaceous vegetation and artificial lakes and ponds, of a more seasonal character.

On the periphery of the site, a mesh of agricultural fields are visible, separated by hedgerows that clearly delimit these properties.

A visual element that stands out in the reading of this landscape are the high voltage electric poles whose cables cross the site in its central area, from east to west.

Some clusters of more or less dispersed dwellings and some small industrial units are also visible, in the broader landscape.

According to the Biodiversity Chapter prepared for this EIAR, the following distinct habitat types were identified:

- GS4 - Wet grassland
- WS1 - Scrub
- ED3/GS4 - Recolonising bare ground/Wet grassland
- WN6 - Wet willow-alder-ash woodland
- GS2 - Dry meadows and grassy verges
- FL8 - Other artificial lakes and ponds
- ED3 - Recolonising bare ground
- ED2 - Spoil and bare ground
- WL1 - Hedgerow
- FW4 - Drainage ditch
- ED5 - Refuse and other waste



Considering this distribution, the habitats that have a greater predominance in the site are the "WS1 - Scrub" and "GS4 - Wet grassland" that combined constitute more than 50% of the total site coverage.

One invasive plant species was identified, within the tetrad associated with the Proposed Development site. One species is Japanese Knotweed (JK) *Fallopia japonica*. JK is a *High impact* invasive species (Kelly et al. 2013). The other invasive recorded within the relevant tetrads, Sycamore *Acer pseudoplatanus*, was not found on the site during the site surveys in May and June 2022.



Figure 10-12: Example of hedgerow at the site. This photo is of the northeast boundary hedgerow.

10.3.5 Topography and Soils

The topography surrounding the site comprises gently rolling farmland with elevations of approximately 80meters above Ordinance Datum (maOD) towards the south of the site which

slope slightly towards the M4 motorway located approximately 0.79km north of the site (which lies at approximately 70maOD) Figure 10-13 illustrates the topography of the area along the M4, both to the north and south, as flat, with the highest altitude points being located in the townlands of Cloghanna and Carbury, to the south of the site.

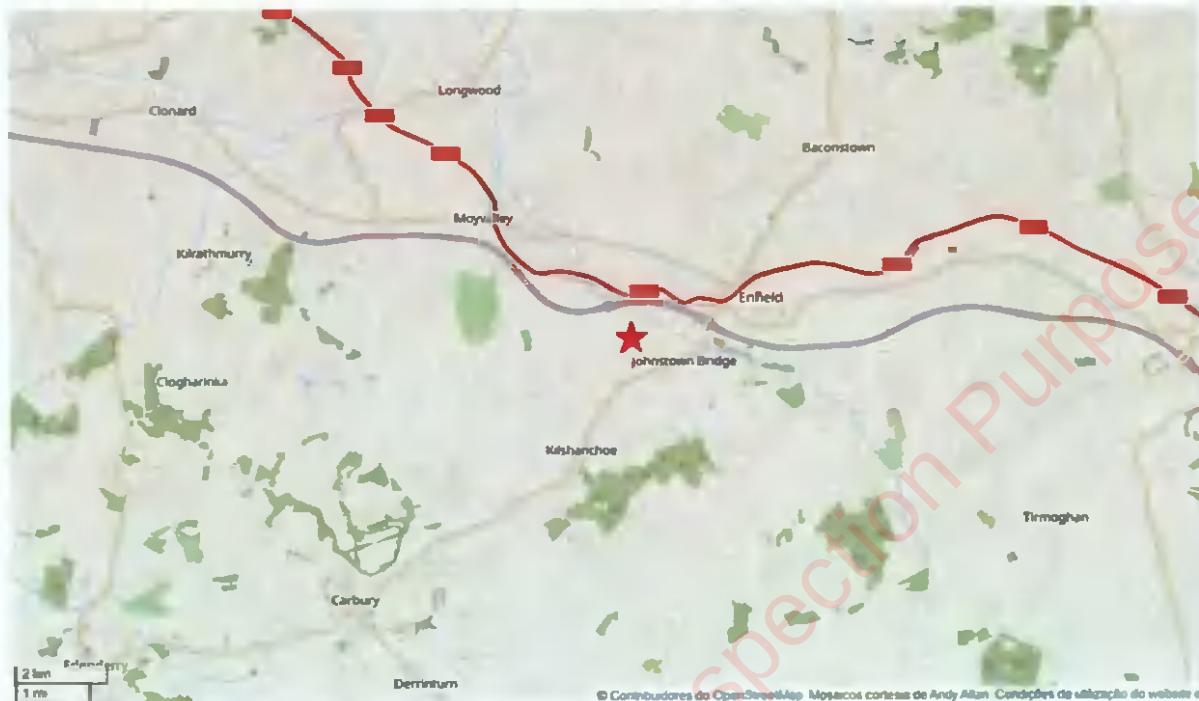


Figure 10-13: Topography on the Broader Landscape. Source: Openstreetmap.
Proposed Development site marked with a star

The topographical survey of the site indicated that the topography ranges from a high point 79mOD in the unworked area of the quarry in the central portion of the site to 74mOD at the quarry floor in the north, west and south of the site. There is a steep slope between the quarry pit floor at approximately 74mOD and the western boundary of the Proposed Development site at 77mOD.





Figure 10-14: Existing Survey

The soil beneath the site has been mapped by Teagasc (Teagasc, 2022) as moderately drained fine loamy drift with limestones of the Elton (1000x) soil series (Teagasc, 2022).

The subsoils or quaternary soils beneath the site are mapped by the GSI (GSI, 2022) as gravels derived from limestones (GLs) in the central and northern portions of the site, 'till derived from limestones (TLs)' in the northwest and southwest corners of the site and 'lacustrine sediments' in the southeast corner of the site.

10.3.6 Existing Protected Structures

There are no protected structures within the site boundary.

20 protected structures were identified in the broader landscape, as shown in Figure 10-15 (blue circles).

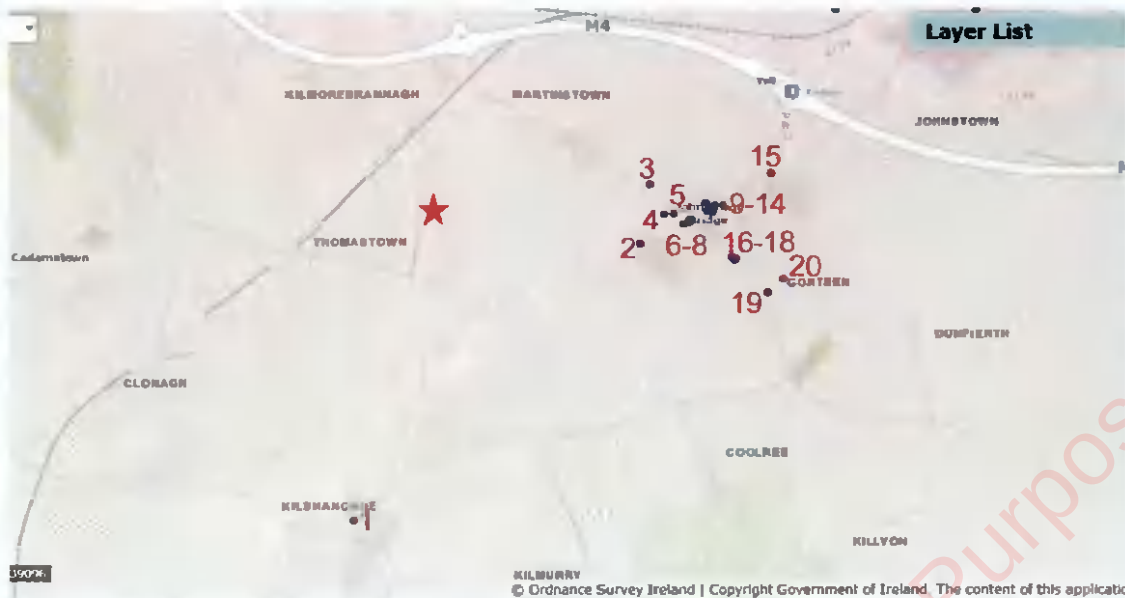


Figure 10-15: Protected Structures, National Monuments Service.

1. Kilshanchoe Catholic Church - Reg. No. 11900311



Figure 10-16: Kilshanchoe Catholic Church

Date: 1860 - 1900

Original Use: bell tower/stand

In Use as: bell tower/stand

Rating: Regional

Distance: This structure is located 2.0 km from the Proposed Development site.

Visual Impact: There is no visibility to the Proposed Development site, due to the existing built structures and vegetation to the North of this protected structure.

2. Reg. No. 11801010

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Figure 10-17: water pump

Date: 1890 - 1920

Original Use: water pump

In Use as:

Rating: Regional

Distance: This structure is located 1.25 km from the Proposed Development site.

Visual Impact: There is no visibility to the Proposed Development site, due to the existing built structures and vegetation to the West of this protected structure.

3. Reg. No. 11801001



Figure 10-18: Mill (wind)

Date: 1710 - 1715

Original Use: mill (wind)

In Use as:

Rating: Regional

Distance: This structure is located 1.32 km from the Proposed Development site.

Visual Impact: There is no visibility to the Proposed Development site, due to the existing built structures and vegetation to the Southwest of this protected structure.

4. Reg. No. 11801009





Figure 10-19: Farm house

Date: 1810 - 1830

Original Use: farm house

In Use as: farm house

Rating: Regional

Distance: This structure is located 1.4 km from the Proposed Development site.

Visual Impact: There is no visibility to the Proposed Development site, due to the existing built structures and vegetation to the West of this protected structure.

5. Reg. No. 11801008

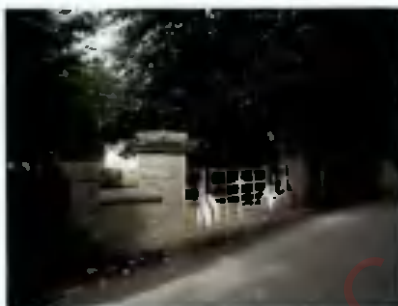


Figure 10-20: gates

Date: 1810 - 1830

Original Use: gates/railings/walls

In Use as: gates/railings/walls

Rating: Regional

Distance: This structure is located 1.5 km from the Proposed Development site.

Visual Impact: There is no visibility to the Proposed Development site, due to the existing built structures and vegetation to the West of this protected structure.

6. Reg. No. 11801007



Figure 10-21: Monument

Date: 1410 - 1415

Original Use: monument

In Use as: monument

Rating: Regional

Distance: This structure is located 1.525 km from the Proposed Development site.

Visual Impact: There is no visibility to the Proposed Development site, due to the existing built structures and vegetation to the West of this protected structure.

7. Reg. No. 11801016



Figure 10-22: House

Date: 1830 - 1870

Original Use: house

In Use as: house

Rating: Regional

Distance: This structure is located 1.55 km from the Proposed Development site.

Visual Impact: There is no visibility to the Proposed Development site, due to the existing built structures and vegetation to the West of this protected structure.



8. Reg. No. 11801017



Figure 10-23: House

Date: 1830 - 1870

Original Use: house

In Use as: house

Rating: Regional

Distance: This structure is located 1.55 km from the Proposed Development site.

Visual Impact: There is no visibility to the Proposed Development site, due to the existing built structures and vegetation to the West of this protected structure.

9. Saint Patrick's Catholic Church - Reg. No. 11801004



Figure 10-24: Church

Date: 1820 - 1840

Original Use: church/chapel

In Use as: church/chapel

Rating: Regional

Distance: This structure is located 1.67 km from the Proposed Development site.

Visual Impact: There is no visibility to the Proposed Development site, due to the existing built structures and vegetation to the West of this protected structure.



10. Johnstown National School - Reg. No. 11801005



Figure 10-25: Johnstown National School

Date: 1810 - 1815

Original Use: school

In Use as: engine shed

Rating: Regional

Distance: This structure is located 1.67 km from the Proposed Development site.

Visual Impact: There is no visibility to the Proposed Development site, due to the existing built structures and vegetation to the West of this protected structure.

11. Johnstown National School - Reg. No. 11801006



Figure 10-26: Johnstown National School

Date: 1810 - 1820

Original Use: school

In Use as: house

Rating: Regional

Distance: This structure is located 1.68 km from the Proposed Development site.

Visual Impact: There is no visibility to the Proposed Development site, due to the existing built structures and vegetation to the West of this protected structure.



12. Reg. No. 11801003

Date: 1880 - 1900

Original Use: post box

In Use as: post box

Rating: Regional

Distance: This structure is located 1.7 km from the Proposed Development site.

Visual Impact: There is no visibility to the Proposed Development site, due to the existing built structures and vegetation to the West of this protected structure.

13. Saint Patrick's National School - Reg. No. 11801019



Figure 10-27: Saint Patrick's National School

Date: 1955 - 1960

Original Use: school

In Use as: school

Rating: Regional

Distance: This structure is located 1.74 km from the Proposed Development site.

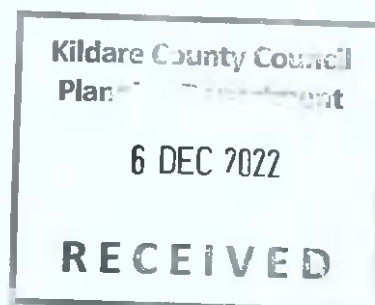
Visual Impact: There is no visibility to the Proposed Development site, due to the existing built structures and vegetation to the West of this protected structure.

14. Reg. No. 11801002



Figure 10-28: Water pump

Date: 1890 - 1920



Original Use: water pump

In Use as:

Rating: Regional

Distance: This structure is located 1.78 km from the Proposed Development site.

Visual Impact: There is no visibility to the Proposed Development site, due to the existing built structures and vegetation to the West of this protected structure.

15. Johnstown Bridge - Reg. No. 11801015



Figure 10-29: Johnstown Bridge

Date: 1830 - 1870

Original Use: bridge

In Use as: bridge

Rating: Regional

Distance: This structure is located 2.1 km from the Proposed Development site.

Visual Impact: There is no visibility to the Proposed Development site, due to the existing built structures and vegetation to the Southwest of this protected structure.

16. Fear English Bridge - Reg. No. 11801011



Figure 10-30: Fear English Bridge

Date: 1830 - 1870

Original Use: bridge

In Use as: bridge

Rating: Regional

Distance: This structure is located 1.85 km from the Proposed Development site.

Visual Impact: There is no visibility to the Proposed Development site, due to the existing built structures and vegetation to the Northwest of this protected structure.

17. Metcalfe Park - Reg. No. 11801012



Figure 10-31: Metcalfe Park

Date: 1820 - 1860

Original Use: gate lodge

In Use as:

Rating: Regional

Distance: This structure is located 1.87 km from the Proposed Development site.

Visual Impact: There is no visibility to the Proposed Development site, due to the existing built structures and vegetation to the Northwest of this protected structure.

18. Metcalfe Park - Reg. No. 11801018



Figure 10-32: Metcalfe Park

Date: 1820 - 1860

Original Use: demesne walls/gates/railings

In Use as: demesne walls/gates/railings

Rating: Regional

Distance: This structure is located 1.85 km from the Proposed Development site.

Visual Impact: There is no visibility to the Proposed Development site, due to the existing built structures and vegetation to the Northwest of this protected structure.



19. Reg. No. 11801013



Figure 10-33: Farm house

Date: 1730 - 1770

Original Use: farm house

In Use as:

Rating: Regional

Distance: This structure is located 2.14 km from the Proposed Development site.

Visual Impact: There is no visibility to the Proposed Development site, due to the existing built structures and vegetation to the Northwest of this protected structure.

20. Metcalfe Park - Reg. No. 11801014



Figure 10-34: Country house

Date: 1700 - 1740

Original Use: country house

In Use as: country house

Rating: Regional

Distance: This structure is located 2.25 km from the Proposed Development site.

Visual Impact: There is no visibility to the Proposed Development site, due to the existing built structures and vegetation to the Northwest of this protected structure.



10.4 Characteristics of the Proposed Development

10.4.1 Description of the Proposed Development

The Proposed Development comprises the importation of material to in-fill and re-contour a site which was previously quarried. The Applicant proposes, subject to the grant of permission, to import clean greenfield soil, subsoil and stone to remediate approximately 3.689ha of the total site. The 3.689ha is divided into two distinct areas – Area 1 is 2.718ha and Area 2 is 0.971ha. A fill plan has been drawn up for the importation of 68,970m³ of soil to fill Area 1, and 16,670m³ to fill Area 2, equating to a total of 85,640m³ (ca. 128,460 tonnes) of soil and subsoil. A volume to weight conversion factor of 1.50 is taken from the Waste Management (Landfill Levy) Regulations, 2008, SI 199 of 2008. The surface layer will comprise of 300mm of topsoil which will be graded to an even surface finish. It is proposed even out the levels of the site in order to allow for the safety of grazing animals. Once the importation is complete the Applicant will seed the land in line with Teagasc guidelines and return it to agricultural use. The proposed new levels and fill plan are detailed in in Figures 10-35 to 10-37, prepared by Enviroguide Consulting, 2022.

Once planning permission is obtained, it is intended to apply to Kildare County Council for a Waste Facility Permit. Material will be accepted in accordance with the conditions of the permit. As part of the Environmental Management Plan a register of incoming materials for the site will be maintained at all times. The only List of Waste (LoW) code accepted on site will be 17 05 04 - Soil and Stones other than those mentioned in 17 05 03. It is proposed to accept material onto the site from 08.00 until 18.00 Monday to Friday and 08.00 to 14.00 on Saturday. It is not proposed to operate on Sundays or Bank Holidays.

Temporary welfare facilities will be located in the northeast of the site as per Figure 10-37, Site Layout Plan, and harvested rainwater will be used in the wheel wash or for dust suppression.

Soil will be imported using Heavy Goods Vehicles from contractors authorised to transport waste, coming from a known source which has previously been inspected. In the interest of maintaining quality of incoming material the number of contractors delivering material to the site will be limited to a single contractor. Prior to deposition the consignment note for each load will be inspected by the site supervisor to ensure that the material is acceptable, and each load will be evaluated in accordance with the site's waste acceptance procedure.

The site has the potential to import inert soil and stones for land improvement for agriculture uses and will also improve drainage. As the site elevations decrease from across the site, with the most acute declines located to the north, it is proposed to raise the northern, central and southern sections of the site to come in line with the boundary elevations, refer to Figures 10-36. The proposed plant will consist of a tracked bulldozer for placing the soil and compressing it to a level that will permit good drainage. An excavator may be brought on to site from time to time to construct internal haul roads.

Thus, the focus of the proposed filling is concentrated in the central and eastern areas of the site. Cut and fill cross sections for the Proposed Development can be seen in Figures 10-38 to 10-39. It is proposed to carry this work out over a 5-year period, subject to the availability of appropriate soil, to allow the soil to settle naturally with minimal compaction. The soil and subsoils will be mixed, to minimise compaction and improve drainage.

Filling operations will be confined to a selected area of the site at any one time with each area being restored in a timely manner from commencement of the next phase.

A 10-meter buffer and silt fence will be maintained along the eastern boundaries of the site where no soil importation will take place to protect surface waters and to ensure that there are no offsite nuisances created by the site.

The re-profiling of the surface will be carried out to allow for the planting of native grassland as recommended by Teagasc. The re-profiling works will be supervised by a qualified landscape architect to ensure that the filling is carried out in a manner that will derive maximum benefit from this.



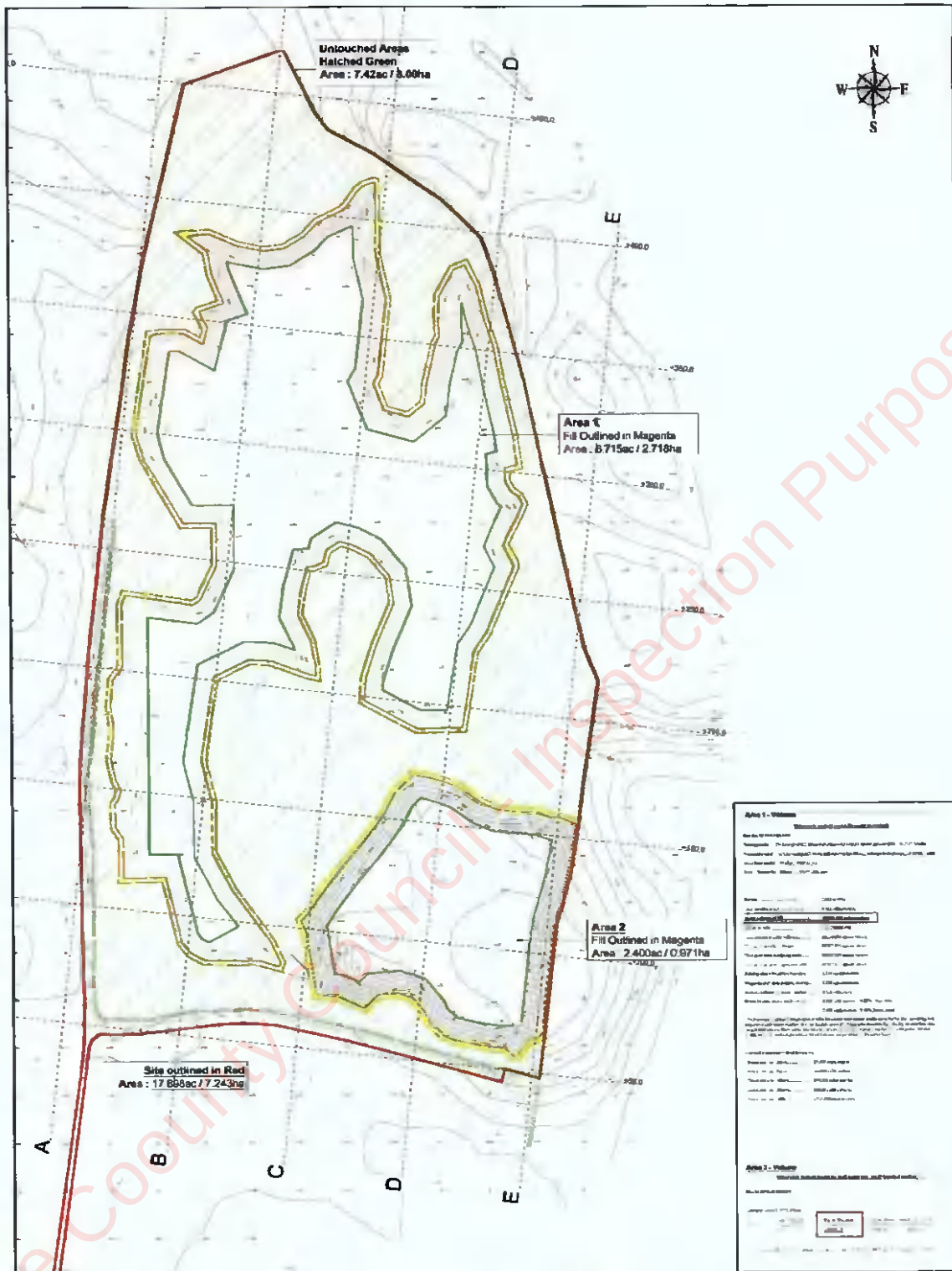


Figure 10-35: Proposed Design Levels

Enviroguide
CONSULTING

EMAIL:
PHONE:
WEBSITE:

Johnstownbridge
DEPARTMENT: DRAWING STATUS:

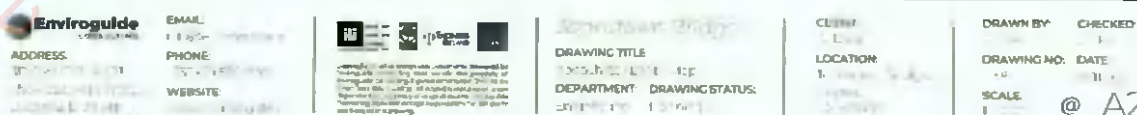
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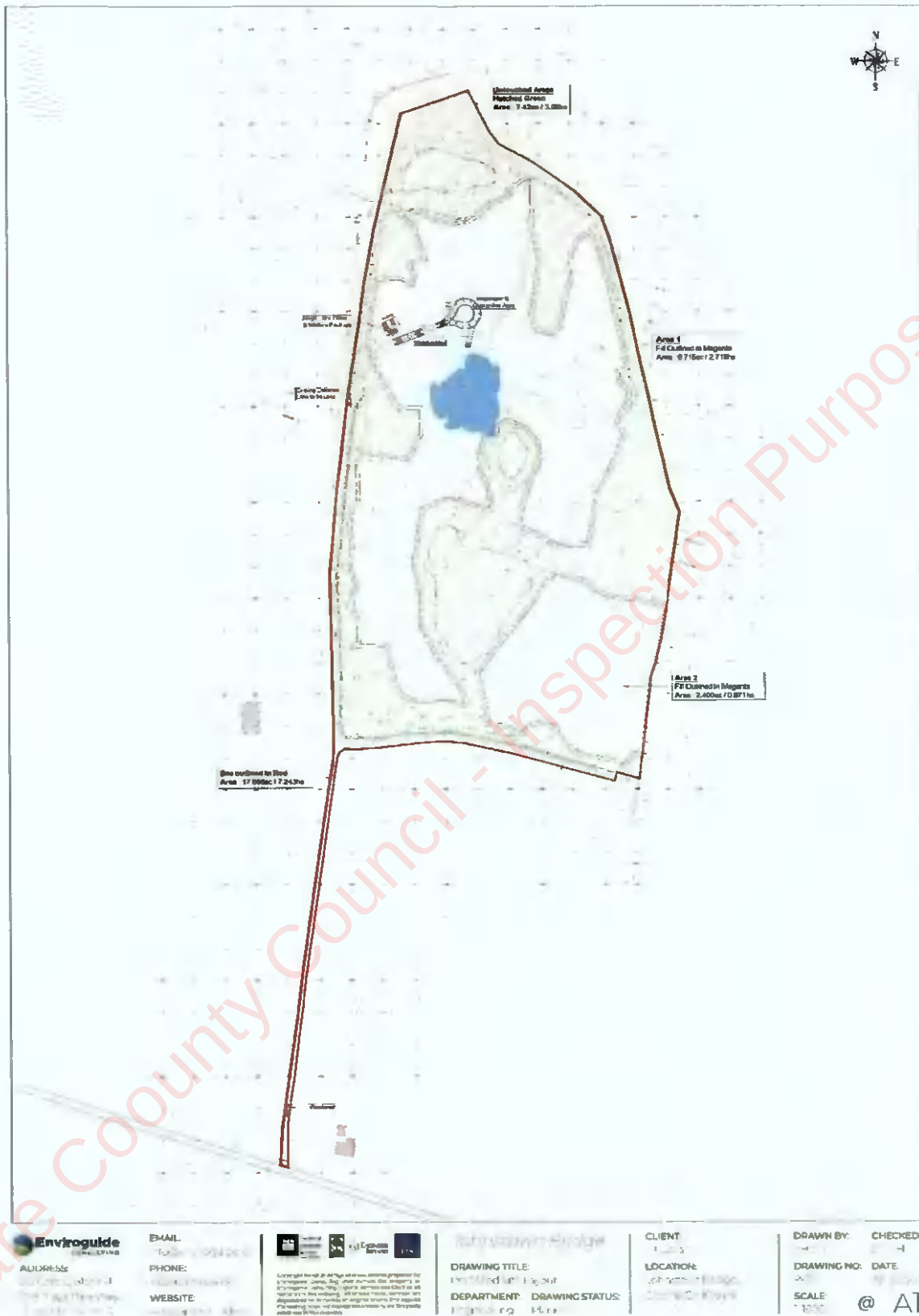
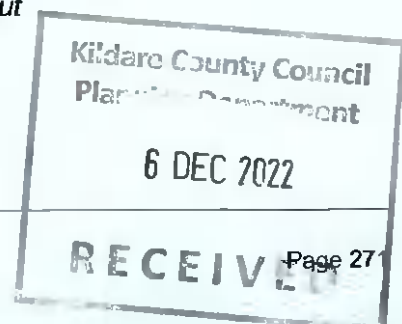


Figure 10-37: Proposed Site Layout



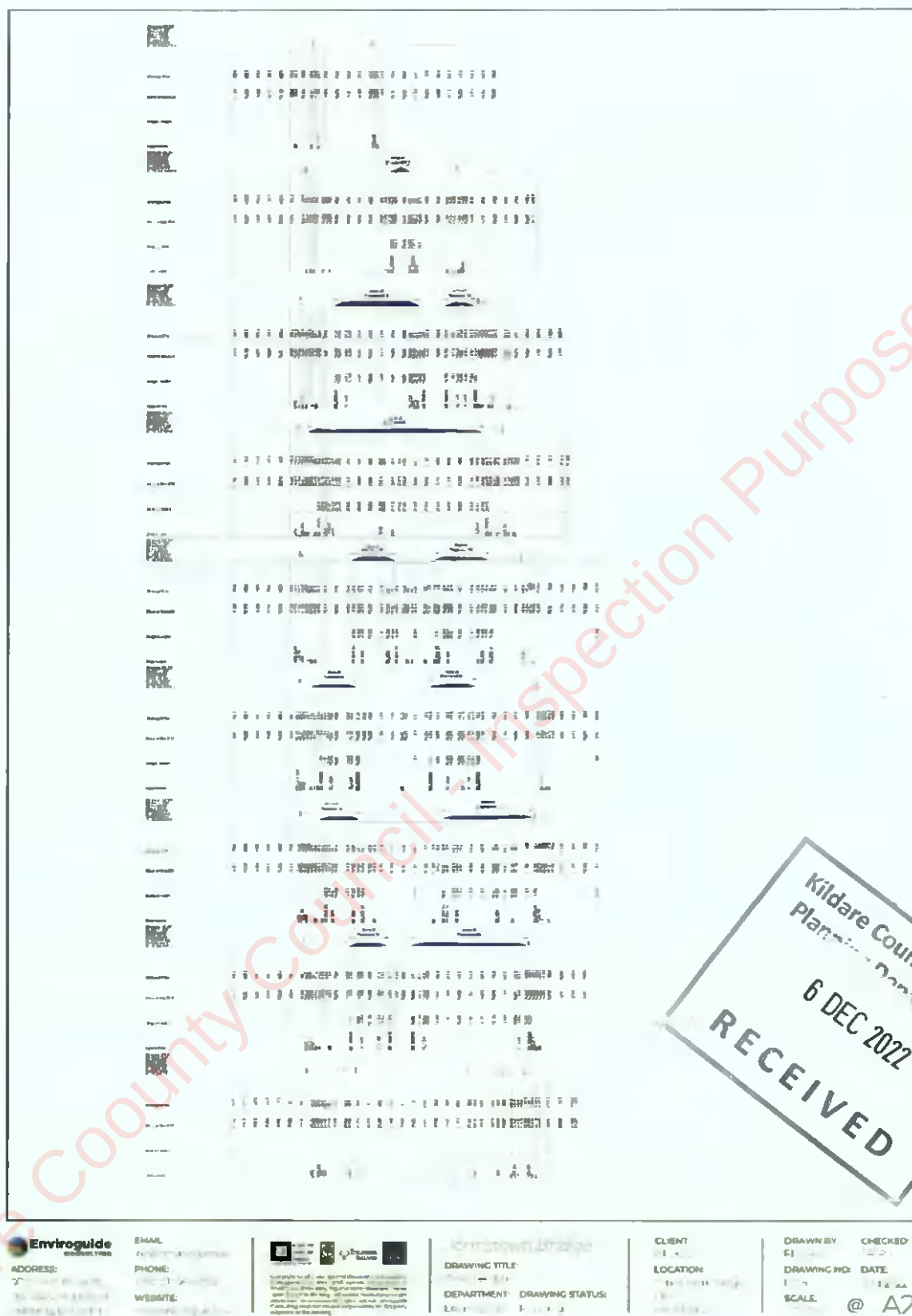
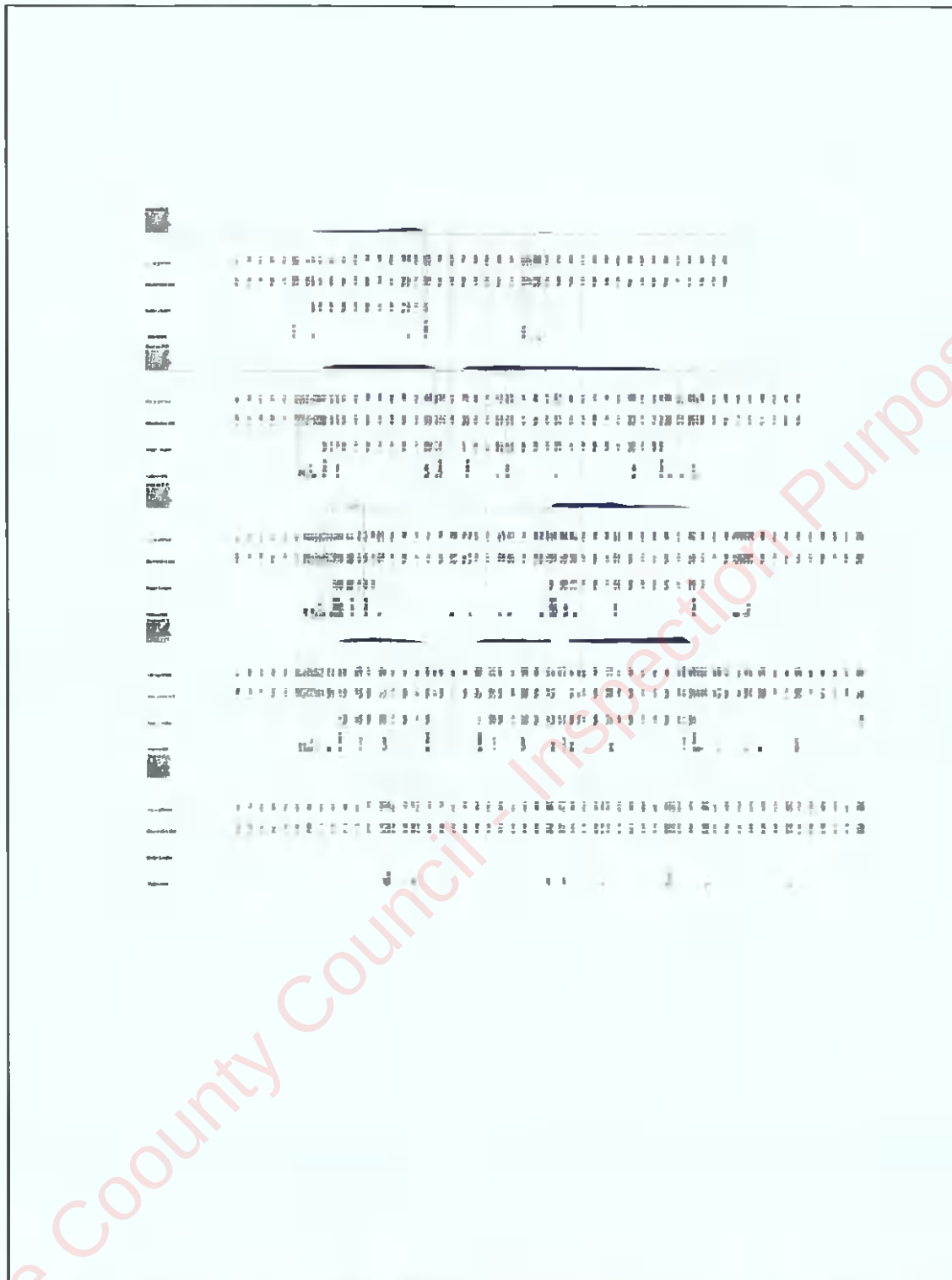


Figure 10-38: Cross Sections



Enviroguide ADDRESS: 27 Ross Court, Johnstownbridge, Co. Kildare EMAIL: info@enviroguide.ie PHONE: 01291 850000 WEBSITE: www.enviroguide.ie	Johnstown Bridge DRAWING TITLE: Cross Sections DEPARTMENT: Planning DRAWING STATUS: Final	CLIENT: Kildare County Council LOCATION: Johnstownbridge, Co. Kildare SCALE: 1:1000	DRAWN BY: E.D. CHECKED: J.D. DRAWING NO.: 10-39 DATE: 12/06/22 SCALE: @ A2
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Figure 10-39: Cross Sections



10.5 Potential Impact of the Proposed Development

10.5.1 Landscape Impacts

10.5.1.1 Construction Phase Landscape Impacts

There will be no Construction Phase for this Proposed Development.

Temporary welfare facilities will be located in the northeast of the site but will have a minor landscape impact.

10.5.1.2 Operational Phase Landscape Impacts

This section assesses the impact of the Proposed Development on the landscape of the area. The Proposed Development is for the importation of material to in-fill and re-contour the site. This includes the vehicle movements, to transport soil and stones onto the Site, and plant required to place material (dozer) and a digger to in-fill and re-contour the site. The focus of filling proposed is concentrated in the central and eastern areas of the site.

The Proposed Development will result in the loss of approximately 3.7 ha of habitat assessed as local importance (higher value) as per the NRA (2009b) scheme. This includes areas of Wet Grassland (approx. 3.5 ha), and three of the more permanent ponds at the site amounting to approx. 0.2 ha.

Once the importation is complete the Applicant will seed the land and return it to agricultural use. The soil and subsoils will be mixed, to minimise compaction and improve drainage.

Considering the percentage of habitat loss, but taking into account that the changes are concentrated in specific areas of the site, the returning of the land to agriculture use, and all existing hedgerows on the peripheral limits of the site are maintained, the Proposed Development will have a moderate and negative landscape impact in the short to medium term. However, after the in-fill and re-contour is completed the Proposed Development will change to have a neutral impact in the long term.

10.5.2 Visual Impacts

An assessment was carried out and identified 8 key viewpoints at locations with public access established through a combination of Viewsheds and site survey to assess local topography and built or vegetation cover. These viewpoints are important in determining the indicative visibility of the site from these key points and the likely visual receptors. Once evaluated and classified, it allows a level of importance to be attached and against this the predicted changes can be assessed. Viewpoints were selected based on the following criteria:

- Locations where there are either significant views (e.g. elevated areas) or areas likely to have extensive views given scenarios such as no vegetation cover;
- Locations where there are likely to be a significant number of visual receptors (e.g. main roads or open space areas); and
- Locations where there are likely to be sensitive receptors (e.g. recreational areas).

10.5.2.1 Viewpoint Locations

The selected viewpoints for the Proposed Development are depicted in Figure 10-40.



Figure 10-40 Selected viewpoints. Viewing altitude: 5.0 km

Photographs determining the existing visual amenity at the selected viewpoint locations are presented in Table 10-13. These photographs and the corresponding description depict the viewer types at each viewpoint and the nature of existing views.

The entrance to the Proposed Development is located along the L5014 local road close to the R402. The L5014 runs northwestwards from the R402 junction, towards Cadamstown and Thomastown. The Site entrance is 600m from the R402 junction, from the south side. This access is only serving the applicants home, therefore there are no visual reference points from the point of the entrance to the referred road. As there will be no visual impact for these receptors, there are no visual reference beyond the L5014.

Table 10-13 Viewpoints locations

VP No.	Location	Direction of view
P1	Unnamed road, northwest of Johnstown Bridge	N
P2	Unnamed road, northwest of Johnstown Bridge	NW
P3	R402, southwest of Johnstown Bridge	W
P4	R402, southwest of Johnstown Bridge	W/SW
P5	L5014 between R402 and L1003	S
P6	L5014 between R402 and L1003	S
P7	L5014 between R402 and L1003	SE
P8	L5014 between R402 and L1003	SE

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Viewpoint 1

Coordinates: 53.243664, - 6.524737

Direction facing: S



Figure 10-41: Viewpoint 1

This viewpoint is along an unnamed road in direction to Johnstown Bridge and is located north of the Site.

In the foreground there is a fence which has a significant visual impact.

In the background, on the left side, there is a shrub-hedgerow that limits the private field. Even further away is a patch of trees with a mixture of deciduous and perennials.

On a more distant plan, what stands out are the two medium voltage posts that differ from the unity of the existing landscape.

The visibility to the Proposed Development site is blocked by the vegetation that exists between this area and the site.

The dashed red lines mark the limits of the Proposed Development.

Impact: **Neutral**



Viewpoint 2

Coordinates: 53.242793, - 6.521964

Direction facing: SW



Figure 10-42: Viewpoint 2

This viewpoint is along and unnamed road in direction to Johnstown Bridge and is located north of the site.

In the foreground there is a shrub-hedge that separates the road to the private field behind. The separation of the fields with this shrub-hedgerow dominates the landscape, being only broken by the punctual presence of some trees and a denser mesh of trees in the background. The visibility to Proposed Development site is blocked by the vegetation that exists between this area and the site.

The dashed red lines mark the limits of the Proposed Development.

Impact: **Neutral**



Viewpoint 3

Coordinates: 53.235823, - 6.515897

Direction facing: W



Figure 10-43 Viewpoint 3

This viewpoint is along R402 and is located east of the site.

On this road, the hedgerow with a mostly shrub composition (about 1.5-2.0 meters high) almost blocks the visibility to the background, this being one of the few sections where the landscape behind it is visible.

In this opening it is possible to verify the presence of a very dense tree patch to the east.

The presence of electrical cables associated with the medium voltage pole somewhat breaks the unity of this landscape.

The visibility to Proposed Development site is blocked by the vegetation that exists between this area and the site.

The dashed red lines mark the limits of the Proposed Development.

Impact: **Neutral**



Viewpoint 4

Coordinates: 53.235253, - 6.521993

Direction facing: W/NW



Figure 10-44: Viewpoint 4

This viewpoint is along R402 and is located east of the site.

In this section of the road there is a greater opening to the landscape, being the separation between the road and the private fields made by a wooden fence that dominates the foreground.

In the background, the landscape is composed of an herbaceous stratum with some isolated trees, or in small groups and, in a more distant plan, by denser patches of trees.

The visibility to Proposed Development site is blocked by the vegetation that exists between this area and the site.

The dashed red lines mark the limits of the Proposed Development.

Impact: **Neutral**

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Viewpoint 5

Coordinates: 53.235250, - 6.525430

Direction facing: N



Figure 10-45 Viewpoint 5

This viewpoint is along L5014 road and is located south of the Site.

The two dwellings mark this point of view, with the Proposed Development site being in the background, almost at the centre of this view.

The property fences, of different design, mark the foreground and the hedgerow that exists in the private terrain to the north of the houses makes the Proposed Development site practically imperceptible.

The dashed red lines mark the limits of the Proposed Development.

Impact: **Neutral**



Viewpoint 6

Coordinates: 53.235438, - 6.53350

Direction facing: N



Figure 10-46 Viewpoint 6

This viewpoint is along L5014 road and is located south of the site.

The view is marked by the road that gives access to the Proposed Development site, with a shrub-hedge on both sides of the road.

In the foreground, the shrub hedge and the existing tree lines mark this landscape.

In the background, the hedgerow that limits the property is visible.

The visibility to the site is almost blocked by the existing group of trees that are located south of the site.

From this point of view, there may be some visibility for Development, namely during the earthworks, but this will be almost negligible.

The dashed red lines mark the limits of the Proposed Development.

Impact: **Neutral**



Viewpoint 7

Coordinates: 53.235564, - 6.53999

Direction facing: NE



Figure 10-47 Viewpoint 7

This viewpoint is along L5014 road and is located southwest of the site.

The shrub-hedge next to the road, in the foreground, marks this view.

The meadow-lined property dominates the background view, with tree lines and hedgerows that limit the other properties on a third visual plan.

The uniformity of this landscape is interrupted by the electrical poles and cables.

The visibility to the inside of the site is blocked by the existing vegetation.

The dashed red lines mark the limits of the Proposed Development.

Impact: **Neutral**



Viewpoint 8

Coordinates: 53.235881, - 6.533303

Direction facing: NE



Figure 10-48 Viewpoint 8

This viewpoint is along L5014 road and is located southwest of the site.

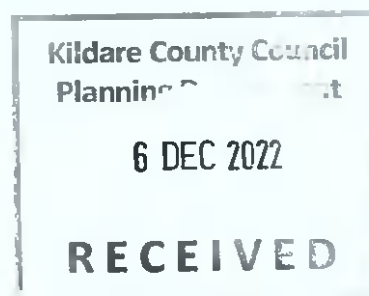
An open field marks the landscape from this point of view, being limited by the shrub-hedge close to the road, in the foreground.

The dwelling on the right of the view interrupts the uniformity of this landscape; however the hedge that limits this property makes some visual integration of this element.

The hedgerows, along the limits of the fields, mark the reading of the landscape in the background.

The dashed red lines mark the limits of the Proposed Development.

Impact: **Neutral**



10.5.2.2 Visual Impacts Effects Conclusion

The potential visual impacts of the Proposed Development were assessed the examination of specific views to and from the site of the Proposed Development. Visual impacts arise when the Proposed Development and the activities associated with the Proposed Development result in any changes to the existing visual environment.

Due to the agricultural nature of the site of the Proposed Development, the lack of nearby sensitive receptors, and the proposed design it is considered that the Proposed Development will have a 'neutral' 'long-term' visual impact.

As can be seen from the analysis of the presented views, the distance from the Proposed Development site to essential points of use, such as roads or living/leisure areas, allied with the maintenance of the existing green structure on the periphery of the property helps to achieve this visual neutrality.

Since each one of the eight study points indicated above depicts a specific landscape, Table 10-14 presents an evaluation using the methodology defined in the beginning of this Chapter.

Table 10-14 Landscape and Visual Impacts

	Landscape Magnitude – Criteria	Visual Magnitude Criteria	Landscape – Sensitive Criteria	Visual Sensitivity – Criteria	Categories of Landscape and Visual Significance	Duration of Impacts	Quality of Effects
1	Very Low	Very Low	High-Medium	Medium-Low	Negligible	Temporary	Neutral
2	Very Low	Very Low	High-Medium	Medium-Low	No impact	Temporary	Neutral
3	Low	Low	Medium	Medium	Negligible	Temporary	Neutral
4	Low	Low	High-Medium	Medium-Low	Negligible	Temporary	Neutral
5	Low	Low	Medium	Medium	Negligible	Temporary	Neutral
6	Low	Low	Medium	Medium-Low	Minor	Temporary	Neutral
7	Low	Low	Medium	Medium-Low	Minor	Temporary	Neutral
8	Low	Low	Medium	Medium	Minor	Temporary	Neutral

10.5.3 Potential Cumulative Impacts

Cumulative impacts can be described as impacts that result from changes caused by a development in conjunction with other past, present, or reasonably foreseeable actions.

In the context of landscape and visual impact and given the agricultural nature of the location of the Proposed Development and its surrounding environment, no cumulative effects are anticipated from the introduction of the Proposed Development.

10.5.4 “Do Nothing” Impact

The do-nothing impact refers to the non-implementation of the Proposed Development. The primary effect of this would be that the impacts and effects identified would not directly occur.

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A do-nothing scenario would result in the site remaining undeveloped. If the Proposed Development were not to proceed, the existing site would continue to be present in the landscape.

The land of the current Site is currently of no economic or agricultural value. As the site sensitivity can be classed as 'Low', a 'Do-Nothing' scenario would result in under-utilisation of the landscape in terms of improving the Proposed Development for ecological and agricultural purposes and would be limited in the range of amenity and use.

10.6 Avoidance, Remedial & Mitigation Measures

As the landscape and visual impacts of the Proposed Development will not cause any significant long-term negative impacts on the surrounding landscape or visual amenities, it is not foreseen that any avoidance, remedial or mitigation measures will be required for the Proposed Development.

The most essential measure to maintain this visual neutrality, in the long term, is the maintenance of the tree/shrub hedge that surrounds the property, which may require some cleaning and maintenance actions.

10.6.1 "Worst Case" Scenario

The worst-case effects arise when the mitigation measures as proposed substantially fail. This would result in landscape and visual impacts lasting in the medium to long term as natural regeneration of pioneer species would be expected to grow and help mitigate impacts.

In the worst-case scenario where mitigation measures fail for the Proposed Development, it is considered that localised nuisances such as noise or dust may arise. This is considered highly unlikely and indeterminable.

10.7 Residual Impacts

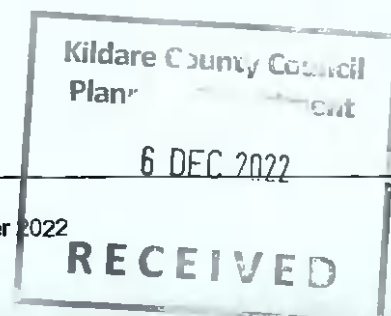
Residual Impacts are defined as *'effects that are predicted to remain after all assessments and mitigation measures'*. They are the remaining *'environmental costs'* of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts. Potential residual impacts from the Proposed Development were considered as part of this environmental assessment.

10.7.1 Construction Phase

No negative residual impacts in the context of landscape and visual impact are anticipated regarding this Proposed Development in the Construction Phase.

10.7.2 Operational Phase

It is considered that the Proposed Development will have a residual minor local impact on the landscape character of its environs and reduce rapidly with distance to impacts which are negligible, neutral long-term impacts.



10.8 Monitoring

10.8.1 Construction Phase

No specific monitoring measures were considered in the Construction Phase.

10.8.2 Operational Phase

Specific monitoring requirements will be that which comply with the proposed Waste Facility Permit, subject to grant of the planning application by Kildare County Council.

The re-profiling works will be supervised by a qualified landscape architect to ensure that the filling is carried out in a manner that will derive maximum benefit from this.

As already referred the monitoring and maintenance of the hedgerows of the Proposed Development is essential. Any works within close proximity to retained trees are advised to be undertaken in accordance with approved method statements prepared by the construction contractor under the direct supervision of a qualified consultant Arboriculturist. Therefore, during the operational phase, a professionally qualified Arboriculturist is recommended to be retained by the principal contractor or site manager to monitor and advice on any works within the RPA of retained trees to ensure successful tree retention and planning compliance. The Arboriculturist is to make regular site visits to ensure that the tree protection measures are in place and adhered to.

10.9 Interactions

Interactions between Landscape and Visual Impact and other aspects of this Environmental Impact Assessment Report have been considered and are detailed below.

10.9.1 Population and Human Health

It is not considered that the Proposed Development by virtue of its visual appearance and in the context of the proposed zoning of the site of the Proposed Development and nature of the surrounding landscape, will cause any issues for the residential local population.

10.9.2 Biodiversity

An assessment of the potential impact of the Proposed Development on the receiving land and soil is included in Chapter 5 of this EIAR.

The proposed landscape of the site interacts with its biodiversity and ecology through the changes that will occur to the existing habitats and flora at the site. The landscape will entail losses in terms of vegetation, which in turn will affect the ecology of the site.

10.9.3 Archaeology and Cultural Heritage

As there are no known archaeological or architectural remains found during the desk top survey as well as the walkover survey, it is not predicted that any changes in landscape or visual impact will affect in any way the archaeology of the area.

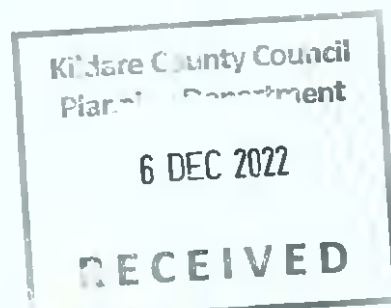
As there are no known archaeological or architectural remains found during the desk top survey as well as the walkover survey, it is not predicted that any changes in landscape or visual impact will affect in any way the archaeology of the area.

10.10 Difficulties Encountered When Compiling

No difficulties were encountered in the preparation of this Chapter.

10.11 References

- A Handbook on Environmental Impact Assessment, Scottish Natural Heritage
- Atlas of the Irish rural landscape, Aalen, Whelen, Stout
- EPA Maps, website, <https://gis.epa.ie/EPAMaps/>
- Environmental Protection Agency (EPA) Guidelines on the Information to be contained in Environmental Impact Assessment Report (2022)
- EPA Advice notes on current practice in the preparation of environment impact statements (2003)
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment. - Department of Housing, Planning and Local Government 2018
- Historic Landscape Characterisation in Ireland: Best Practice Guidance 2013 - The Heritage Council
- Journal of Environmental Psychology, Visual Thresholds for Detection, Recognition and Visual Impact in Landscape Settings (H. Shang and I.D. Bishop, 2000)
- Landscape design with plants, Brian Clouston
- Revised Guidelines (Draft) on the Information to be contained in Environmental Impact Statements (2015) Environmental Protection Agency
- Section 177F of the Planning and Development Act 2000 (as amended)
- Kildare County Development Plan 2017-2023
- The National Parks and Wildlife Service (NPWS) website, www.npws.ie
- Technical Information Note on Townscape Character Assessment, 2016, published by the Landscape Institute
- The Institute of Environmental Management and Assessment (IEMA) and Landscape Institute (UK) 'Guidelines for Landscape and Visual Impact Assessment' (GLVIA-2013)
- The Landscape Institute, 'Guidelines for Landscape and Visual Impact Assessment', (3rd Edition) 2013
- The Countryside Agency and Scottish Natural Heritage – Landscape Character Assessment Guidance for England and Scotland' 2002



11 ARCHAEOLOGY AND CULTURAL HERITAGE

11.1 Introduction

This Chapter of the EIAR describes and assesses the potential effects of the Proposed Development, located in Thomastown townland, Johnstown Bridge, Co. Kildare, on Archaeology, Cultural Heritage and Architectural Heritage.

The aim of this Chapter is to assess the baseline Archaeological, Architectural and Cultural Heritage conditions of the surrounding environment for the Proposed Development, in order to determine any significant impacts that may arise as a result of the Proposed Development and highlight any potential effects this may have on these resources. In addition, mitigation measures are recommended, in accordance with the policies of Kildare County Council, the Department of Arts, Heritage, Regional, Rural and Gaeltacht affairs, the National Monuments Acts 1930-2004 and best practice guidelines.

The assessment comprised a paper survey and cartographic research. The sources used were the Record of Monument and Places (RMP), Department of Culture, Heritage and the Gaeltacht (DoCHG), the National Museum of Ireland topographical files, the County Development plans and various literature resources.

The RMP is comprised of manuals listing all known archaeological sites and monuments in each County with accompanying maps locating these sites and additional information from archaeological excavations and assessment records in the intervening period. All sites included in the RMP are protected under the National Monuments Acts (1930-2004). The record is continually updated with information from the results of on-going research and excavation, as new sites are discovered. The types of Recorded National Monuments, both within the study area and in the immediate vicinity, have served to inform the author in the development of a hypothesis as to the potential sub-surface archaeology within the study area. This is backed up by the results of previous archaeological excavations and investigations both within and without the study area published in excavation summary reports for each year (www.excavations.ie).

The National Museum maintains a register of finds of archaeological objects from each townland in the twenty-six counties of the Republic of Ireland. Detailed records are held for each find, many of which are regarded as 'stray finds' having been recovered by farmers in the course of ploughing or other such activities and received to the museum in accordance with national monuments legislation. The records contain information such as type and location of find, correspondence between the museum and the finder, and, where applicable, results of excavations carried out by museum staff at the location of the finds.

The Kildare County Development Plan (2017-2023) has a list of protected structures which has established the preservation of these structures including their settings. The Record of Protected Structures was established under the Local Government (Planning and Development) Act 2000 and comprises a listing of structures of architectural, historical, archaeological, artistic, cultural, scientific, social, or technical interest, along with accompanying maps. It also safeguards the protected structures along with their curtilage.

against any development without the express permission of the Minister for the Department of Arts Heritage and the Gaeltacht.

A number of literary sources and Cartographic maps were also consulted. Literary sources are a valuable means of completing the written archaeological record of an area and gaining insight into the history of the environs of the proposed works. The principal sources consulted are listed in the bibliography at the end of this Chapter. Cartographic maps consulted were the OS 6-inch first edition mapping (1837-1842), 25-inch mapping series (1889-1913) and third edition (1909) for Co. Kildare.

11.1.1 Quality Assurance and Competence

This Chapter was prepared by Louise Hewitt, Environmental Consultant, Enviroguide Consulting. Louise has a Master of Science (Hons) in Environmental Resource Management from University College Dublin and a Bachelor of Science (Hons) in Biology from Maynooth University. Louise has worked as an Environmental Consultant with Enviroguide since 2021 and has experience preparing Environmental Impact Assessment (EIA) Screening Reports, Introduction, Population and Human Health and Archaeology and Cultural Heritage Chapters of EIARs.

11.2 Study Methodology

11.2.1 Guidance and Legislation

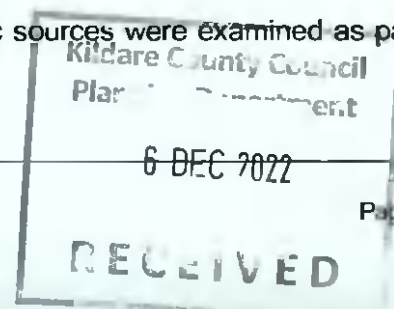
The following legislation and guidance documents were consulted as part of this assessment. This legislation makes up the main legal mechanisms by which Archaeological, Architectural and Cultural Heritage resources are protected in Ireland.

- National Monuments Act, 1930-2014;
- Heritage Act, 1995;
- Architectural Heritage and Historic Properties Act, 1999;
- Local Government (Planning and Development) Act, 2000
- The Planning and Development (Strategic Infrastructure) Act, 2006;
- EPA 'Advice Notes for preparing Environmental Impact Statements' (Draft 2015);
- EPA 'Guidelines on the Information to be Contained in Environmental Impact Statements' (EPA, 2002);
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, Department of Arts, Heritage, Gaeltacht and Islands;
- Architectural Heritage Protection: Guidelines for Planning Authorities, 2011, (formerly) Department of Arts, Heritage and the Gaeltacht.

The assessment contained in this Chapter has involved a desktop study / paper survey which considered all available archaeological, architectural, historical and cartographic sources. This information was used in order to assess any potential impact on the receiving environment and to identify measures to ensure the conservation of any monuments or features.

11.2.2 Desk Study

The following archaeological, historical and cartographic sources were examined as part of the paper study:



Records of Monuments and Places (RMP) is a list of monuments recorded under Section 12 (1) of the National Monuments (Amendment) Act 1994.

Sites and Monuments Record (SMR) is a national baseline database of known archaeological sites and monuments in Ireland.

Topographical Files of the National Museum of Ireland is an archive containing records of all finds logged by the National Museum.

Aerial Photographs provide an important archaeological resource in terms of detecting new sites and identifying the exact location and extent of known sites. These features can be identified through surface anomalies such as earthworks or distinct vegetation marks.

Excavations Bulletin is an annual publication, started in 1970, which summarises all archaeological excavations carried out in Ireland each year (www.excavations.ie).

The National Inventory of Architectural Heritage is a comprehensive database of structures relating to the architectural heritage of Ireland.

Kildare County Development Plan contains a list of Architectural Conservation Areas and recorded Protected Structures for County Kildare.

Cartographic Sources are important in providing topographical information on areas of archaeological potential as well as tracing land use development within the Proposed Development area.

11.3 The Existing and Receiving Environment (Baseline Situation)

The Applicant is seeking planning permission from Kildare County Council for the importation of material to in-fill and re-contour the Site at Thomastown, Johnstown Bridge, Co. Kildare.

Johnstown Bridge village is located ca. 1.8 km to the east of the development Site and the village of Kilshanroe is 2.15 km to the southwest. The setting is predominantly rural with surrounding land uses of agriculture, forestry, and several one-off residential dwellings and one-off commercial type facilities. The Site is located approximately 2.4 km from junction 9 on the M4 motorway. The Proposed Development has a total area of 7.243 hectares.

The Applicant is proposing to remediate the Site to render it suitable for agriculture.

11.3.1 Archaeological and Historical Background

The Site of the Proposed Development at Johnstown bridge is situated in close proximity to Enfield. Little is known historically about the area surrounding Johnstown and the history of Enfield is closely connected to the history of transport throughout south Meath. In the 1790's, maps denote the site of Enfield as "The New Inn" and eventually Innfield. This derives from a mail-coach inn on the 18th century Dublin to Mullingar coach route through Innfield. With the arrival of the Great Western Railway the name became anglicised to Enfield.

The Recorded Monuments in the landscape suggest that the area surrounding the townland of Johnstown and the banks of the River Blackwater have been subject to human development and settlement throughout the prehistoric, early medieval and medieval periods. Prehistoric activity has been identified in the townland of Killickaweeny west of Kilcock where a standing

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stone indicates possible Bronze Age activity. Similarly, a burnt mound or fulachta fiadh (KD003-031) was excavated along the M4 Kinnegad-Enfield-Kilcock Motorway Scheme at Killmorebrannagh townland (Murphy 2004). Radiocarbon analysis of the primary fill from one of the troughs of the burnt mounds returned a date range of Cal BC 2130-2080 and Cal BC 2060-1760 indicating that this Site was Early Bronze Age in date. Barrows and ring ditches are also generally Bronze Age or Iron Age in date. There are two barrows identified as crop marks and located in Kilmurry townland (KD003-039 & 040), located 0.6km from the development lands. One ring ditch (KD003-035) also visible as a crop mark was recorded from Thomastown townland 0.3km from the development lands.

However, the landscape around Johnstown may have been predominantly wetland habitat in prehistoric times, unable to support substantial prehistoric activity leaving only the higher ground available for settlement. It appears highly possible, judging from the topography of the landscape, that large areas located to the south and east of the Johnstown Site may have been wetland associated with the River Blackwater.

Ringforts and enclosures are undoubtedly the most common field monuments within the Irish landscape and there are also several examples from the surrounding areas of Johnstown Bridge. They date to the Early Medieval periods. These include KD003-018, KD003-037, KD003-036, KD004-008 and KD004-009. A ringfort is a space surrounded by an earthen bank formed by material thrown up from a fosse or ditch located immediately outside the earthen bank. Generally, ringforts vary in size from 25–50 metres in diameter and are usually circular in plan but can also be oval or D-shaped.

Judging from the distribution of early medieval ringfort and enclosure sites, it would appear that the landscape around Enfield and Johnstown underwent radical changes from around the fifth century. An increase in population influenced by new agricultural practices would have contributed to these changes.

The Anglo-Norman involvement in Ireland began in 1169 when Richard de Clare landed in Wexford to support MacMurchadha. Approximately two years later, de Clare inherited the kingdom of Leinster. By the end of the twelfth century, the Anglo-Normans had succeeded in conquering much of the country. A moated site possibly related to this period is recorded in Clonagh townland (KD003-025) and located 1.8km south west of the development Site. A kiln/furnace (ME048-33 & 34) was excavated along the M4 Kinnegad to Kilcock motorway in 2002 and has been dated to between the 10th and 12 century AD indicating activity dated to the Later Medieval Period in the surrounding area. It is located 2km north east of the development lands.

11.4 Characteristics of the Proposed Development

The Proposed Development comprises the importation of material to in-fill and re-contour a site which was previously quarried. The Applicant proposes, subject to the grant of permission, to import clean greenfield soil, subsoil and stone to remediate approximately 3.689ha of the total site. The 3.689ha is divided into two distinct areas – Area 1 is 2.718ha and Area 2 is 0.971ha. A fill plan has been drawn up for the importation of 68,970m³ of soil to fill Area 1, and 16,670m³ to fill Area 2, equating to a total of 85,640m³ (ca. 128,460 tonnes) of soil and subsoil. A volume to weight conversion factor of 1.50 is taken from the Waste Management (Landfill Levy) Regulations, 2008, SI 199 of 2008. The surface layer will comprise of 300mm

of topsoil which will be graded to an even surface finish. It is proposed even out the levels of the site in order to allow for the safety of grazing animals. Once the importation is complete the Applicant will seed the land in line with Teagasc guidelines and return it to agricultural use. The proposed new levels and fill plan are detailed in Drawings P-01 to P-07 prepared by Enviroguide Consulting, 2022 (refer to Appendix A).

Once planning permission is obtained, it is intended to apply to Kildare County Council for a Waste Facility Permit. Material will be accepted in accordance with the conditions of the permit. As part of the Environmental Management Plan a register of incoming materials for the site will be maintained at all times. The only List of Waste (LoW) code accepted on site will be 17 05 04 - Soil and Stones other than those mentioned in 17 05 03.

It is proposed to accept material onto the site from 08.00 until 18.00 Monday to Friday and 08.00 to 14.00 on Saturday. It is not proposed to operate on Sundays or Bank Holidays.

Temporary welfare facilities will be located in the northeast of the site as per Figure 2-2, Site Layout Plan and harvested rainwater will be used in the wheel wash or for dust suppression.

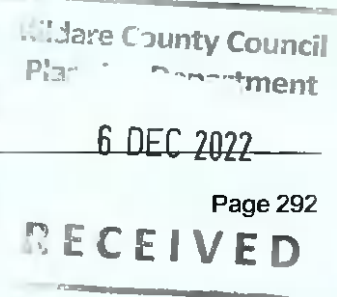
Soil will be imported using Heavy Goods Vehicles from contractors authorised to transport waste, coming from a known source which has previously been inspected. In the interest of maintaining quality of incoming material the number of contractors delivering material to the site will be limited to a single contractor. Prior to deposition the consignment note for each load will be inspected by the site supervisor to ensure that the material is acceptable, and each load will be evaluated in accordance with the site's waste acceptance procedure.

The site has the potential to import inert soil and stones for land improvement for agriculture uses and will also improve drainage. As the site elevations decrease from across the site, with the most acute declines located to the north, it is proposed to raise the northern, central and southern sections of the site to come in line with the boundary elevations, refer to Drawings P-04 and P-05 for elevations. The proposed plant will consist of a tracked bulldozer for placing the soil and compressing it to a level that will permit good drainage. An excavator may be brought on to site from time to time to construct internal haul roads.

Thus, the focus of the proposed filling is concentrated in the central and eastern areas of the site. Cut and fill cross sections for the Proposed Development are attached as part of this planning application (refer to drawings included as Appendix A). Details of existing ground level, proposed change in elevation and final fill level are detailed in Drawings P-01 to P-07. It is proposed to carry this work out over a 5-year period, subject to the availability of appropriate soil, to allow the soil to settle naturally with minimal compaction. The soil and subsoils will be mixed, to minimise compaction and improve drainage.

Filling operations will be confined to a selected area of the site at any one time with each area being restored in a timely manner from commencement of the next phase.

A 10-meter buffer and silt fence will be maintained along the eastern boundaries of the site where no soil importation will take place to protect surface waters and to ensure that there are no offsite nuisances created by the site.



The re-profiling of the surface will be carried out to allow for the planting of native grassland as recommended by Teagasc. The re-profiling works will be supervised by a qualified landscape architect to ensure that the filling is carried out in a manner that will derive maximum benefit from this.

11.4.1 RMP files (Record of Monuments and Places) close to the study area

Within a 2km radius of the development site there are eighteen (18 no.) recorded archaeological monuments. The monuments are listed below, and identified by townland, RMP number, site type, site status and distance of the site for the Proposed Development. The RMP reference consists of a three-letter county code, the relevant number of the Ordnance Survey six-inch sheet on which the Site is located, and the number of the individual monument. This information is gathered from the online Historic Environment Viewer provided by the Department of Culture, Heritage, and the Gaeltacht. These monuments are discussed below within the context of the historical and archaeological background of the surrounding area. No Recorded Monuments will be affected by the development plans.

RMP No. KD003-035----

Townland Thomastown (Cadamstown ED)

Site Type Ring-ditch

Description Situated in SE corner of field containing cropmarks of several enclosures. Ring-ditch visible as a cropmark on aerial photograph taken 11/07/2018. Cropmark of larger enclosure or possible ringfort (KD003-036----) immediately to W.

Distance This RMP site is located 0.6km south of the development Site.

Impact This site will not be affected by the Proposed Development plans.

RMP No. KD003-036----

Townland Thomastown (Cadamstown ED)

Site Type Ringfort - Unclassified

Description Situated in SE corner of field containing cropmarks of several monuments (KD003-035-/037-/038-). Cropmark of circular shaped enclosure with entrance gap at E visible on aerial photograph taken 11/07/2018. Cropmark of smaller ring-ditch (KD003-036----) immediately to E.

Distance This RMP site is located 0.6km south of the development Site.

Impact This site will not be affected by the Proposed Development plans.

RMP No. KD003-037----

Townland THOMASTOWN (Cadamstown ED)

Site Type Ringfort - unclassified

Description Situated in centre of field containing cropmarks of several monuments (KD003-035-/036-/038-). Cropmark of circular shaped enclosure with entrance gap at E visible on aerial photograph taken 11/07/2018. ESB pole stands in NW quadrant of enclosure close to the enclosing cropmark. Curvilinear cropmark running off E side of ringfort may represent the remains of an annexe. Concentration of curvilinear cropmarks running off and across the annexe on N and S side may represent the remains of a field system (KD003-038----). Cropmark of smaller ringfort possible (KD003-036----) and ring-ditch (KD003-035----) to E.

Distance This RMP site is located 0.6km south of the development Site.

Impact This site will not be affected by the Proposed Development plans.

RMP No. KD003-038----

Townland Thomastown (Cadamstown ED)

Site Type Field System

Description Situated in centre of field containing cropmarks of several monuments (KD003-035-/036-/037-). Cropmark of linear earthworks running off and across the annexe of a possible ringfort (KD003-037----) are visible on aerial photograph taken 11/07/2018. Concentration of linear cropmarks running off and across the annexe on N and S side may represent the remains of a field system (KD003-038----). Cropmark of smaller ringfort possible (KD003-036----) and ring-ditch (KD003-035----) to E.

Distance This RMP site is located 0.6km south of the development Site.

Impact This site will not be affected by the Proposed Development plans.

RMP No. KD003-018----

Townland KILSHANCHOE

Site Type Ringfort - rath

Description On a gentle S-facing pasture slope. A large, fairly well-preserved, sub-circular area (int. dims. L 59m N-S; max Wth 58m E-W) is defined by an overgrown inner earthen bank (Wth 4.8m at S-7.4m at E) NNE-SW which is reduced to a scarp (H 2.5m) elsewhere, by an overgrown fosse (Wth 4.5m at E-7.7m at W), and by a second, outer earthen bank (Wth 4.3m; int. H 1.5m; ext. H 0.9m) SW-NW. There is a causewayed entrance (Wth 4m) at NE. Later field boundaries radiate off the monument at SE and W. Visible as densely overgrown on a recent aerial photograph (OSi Orthophoto 2005).

Distance This RMP site is located 1.5km south west of the development Site.

Impact This site will not be affected by the Proposed Development plans.

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RMP No. KD003-041----

Townland KILMURRY (Donadea ED)

Site Type Enclosure

Description Cropmark of circular-shaped enclosure (approx. diam. 25m) visible on Google earth aerial imagery.

Distance This RMP site is located 1.3km south of the development Site.

Impact This site will not be affected by the Proposed Development plans.

RMP No. KD003-043----

Townland KILMURRY (Donadea ED)

Site Type Barrow - unclassified

Description Cropmark of circular-shaped enclosure/barrow (approx. diam. 13m) visible on Google earth aerial imagery.

Distance This RMP site is located 1.3km south of the development Site.

Impact This site will not be affected by the Proposed Development plans.

RMP No. KD003-040----

Townland Kilmurry (Donadea ED)

Site Type Barrow - Unclassified

Description Cropmark of circular-shaped enclosure (approx. diam. 13m) visible on Google earth aerial imagery.

Distance This RMP site is located 1.4km south of the development Site.

Impact This site will not be affected by the Proposed Development plans.

RMP No. KD003-039----

Townland Kilmurry (Donadea ED)

Site Type Barrow - Unclassified

Description Cropmark of circular-shaped enclosure (approx. diam. 12m) visible on Google earth aerial imagery.

Distance This RMP site is located 0.4km south of the development Site.

Impact This site will not be affected by the Proposed Development plans.

RMP No. KD003-042----

Townland Kilmurry (Donadea ED)

Site Type Barrow – Unclassified

Description Cropmark of circular-shaped enclosure (approx. diam. 23m) with possible internal enclosure (approx. diam. 9m) visible on Google earth aerial imagery. The presence of a small inner enclosure may suggest that this is the site of a levelled ring-barrow.

Distance This RMP site is located 1.3km south of the development Site.

Impact This site will not be affected by the Proposed Development plans.

RMP No. KD004-036----

Townland Johnstown (Cadamstown ED)

Site Type Enclosure

Description: Visible on an aerial photograph (Karina Holton, SMR file). At the N end of a short, low, pasture ridge, c. 80m E of the N-flowing Togher River, with lower wet, rushy ground immediately to NW-N-NE. A fairly poorly preserved, oval area (int. diams. 31m E-W; 26m N-S) is defined by a low but very broad earthen bank (av. Wth c. 15m; int. H 0.6-1.1m; ext. H 1.3m). The absence of an obviously visible outer fosse suggests the bank-material may have been sourced from the interior of the site. A road runs E-W along the S-limits and a linear 'headland' (Wth 8m) running parallel to the N of the road is fenced off across the enclosing bank with wooden post-and-rail fencing.

Distance This RMP site is located 0.8km south east of the development Site.

Impact This site will not be affected by the Proposed Development plans.

RMP No. KD003-031----

Townland Kilmorebrannagh

Site Type Fulacht fia

Description In 2002 archaeological testing (Licence No. 02E1075) was carried out before construction of the proposed M4 Kinnegad-Enfield-Kilcock Motorway Scheme and a fulacht fia spread was identified. The site was designated Kilmorebrannagh 1 and was subsequently excavated. A spread of fire-cracked, blackened sandstone measuring 13m by 21m was exposed directly overlying the natural gravels. It had a maximum depth of 0.06m, and when it was removed a series of pits and two troughs were exposed. Both troughs contained lining timbers in situ that were removed for analysis and preservation. One of the troughs was sub-circular, measuring 1.84m by 1.61m by 0.14m deep, and the second was rectangular, measuring 1.78m by 1.62m by 0.26m deep. Near the troughs was an area of highly oxidised orange clay that may have been the location of a hearth. Four pits, all subcircular, were identified near the troughs and were similarly filled with fulacht fia material. No finds of a

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prehistoric nature were identified during excavation. The site had been largely destroyed by recent agricultural activity, and numerous plough furrows and land drains cut through it. (www.excavations.ie)

Distance This RMP site is located 0.7km north of the development Site.

Impact This site will not be affected by the Proposed Development plans.

RMP No. KD004-007----

Townland Gorteen (Dunfierrth ED)

Site Type Ritual site – holy well

Description On the E bank of the NE-flowing Fear English River in improved pastureland. No longer visible at ground-level, and not remembered locally as a holy well.

Distance This RMP site is located 1.6km south east of the development Site.

Impact This site will not be affected by the Proposed Development plans.

RMP No. KD004-042----

Townland Gorteen (Dunfierrth ED)

Site Type Burial

Description In September 2010, the National Museum of Ireland were informed of the accidental discovery of burial remains. A subsequent inspection determined that during the bulldozing of the top of a low hill, the machine operator noticed bones in the disturbed soil and informed the authorities. Four human skulls were collected from the site, and it was thought likely that more burials may be present. (pers. comm. Padraig Clancy, NMI)

Distance This RMP site is located 1.9km east of the development Site.

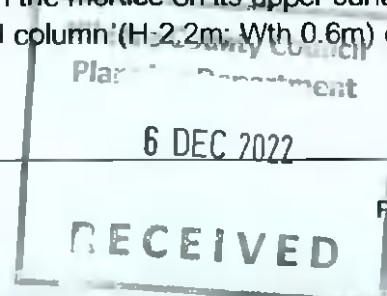
Impact This site will not be affected by the Proposed Development plans.

RMP No. KD004-001----

Townland Johnstown (Cadamstown ED)

Site Type Cross

Description Stands at a T-junction at the SW end of Johnstown Bridge village. Fitzgerald (1891-5, 207) states that it was dug up in the neighbourhood c. 1830 and erected as a commemorative 'suppression' cross, while O'Leary (1896-9, 135-8) suggests that it originated at a church dedicated to St Fionntan at Clonagh Td (KD003-0020----) c. 1.5 miles to the WSW. A pyramidal limestone cross-base (H 0.46m; Wth 0.57m) has a later, 19th century, cherub carved in relief on one face, and carries a small cross in the mortice on its upper surface, on which 'IHS 1412' is carved. It has been placed on a tall column (H 2.2m; Wth 0.6m) of well-dressed limestone blocks.



Distance This RMP site is located 1.6km east of the development Site.

Impact This site will not be affected by the Proposed Development plans.

RMP No. KD004-002----

Townland Johnstown (Cadamstown ED)

Site Type Armorial plaque (present location)

Description Built into the gate piers of a school near the centre of Johnstown Bridge village. Two square plaques (dims. c. 0.5m; c. 0.5m) one bearing the coat-of-arms of Gerald, eleventh Earl of Kildare, and the other those of Sidney, Lord Deputy of Ireland; which according to O'Leary (1896-9, 135-8) came from Clonagh castle (KD003-017----) c. 2 miles to the W. The possible original location is designated KD003-017002-.

Distance This RMP site is located 1.8km east of the development Site.

Impact This site will not be affected by the Proposed Development plans.

RMP No. KD004-003----

Townland Johnstown (Cadamstown ED)

Site Type Architectural fragment

Description Incorporated into a modern wall in Johnstown Bridge village. A small, rectangular window-head (dims. Wth c. 0.4m; H c. 0.25m), containing a chamfered, round-headed ope (diam. 0.15m). It may have come from the castle site (KD003-017----) in Clonagh townland, two miles to the W, from where the nearby armorial plaques (KD004-002----) are said to have originated.

Distance This RMP site is located 1.9km east of the development Site.

Impact This site will not be affected by the Proposed Development plans.

RMP No. KD003-025----

Townland CLONAGH (Cadamstown ED)

Site Type Moated site

Description At the N foot of a low rise in otherwise level pastureland. A poorly preserved rectangular area (int. dims. L 34m E-W; Wth 29m) is defined by a broad, shallow fosse (Wth 10.7-13.5m; D 0.3-0.9m) which is heavily poached by livestock on the E side. The N portion of the level, featureless interior is crossed by tractor tracks.

Distance This RMP site is located 1.2km south west of the development Site.

Impact This site will not be affected by the Proposed Development plans.





Figure 11-1: Location of Proposed Development (red line boundary) in relation to archaeological monuments

11.4.2 Topographical files, National Museum of Ireland (NMI)

There are no topographical files on the Site of the Proposed Development in the National Museum files. The closest recorded topographical file to the Proposed Development is Pot-Sherd (:36); Saddle Quern, Two Frags. (:37); Saddle Quern (:38) - Name: 1968:36-8 which is 3.62km southeast of the site.





Figure 11-2: National Museum of Ireland/Topographical files (marked as green circle)

11.4.3 Cartographic Analysis

The following historical maps were analysed as part of the paper study for this report.

11.4.3.1 Historic six-inch Ordnance Survey Map, 1837-1842

The first edition of the six-inch Ordnance Survey map was carried out from 1837-1842. This map shows the Proposed Development Site and surrounding areas as a series of agricultural land separated by field boundaries. This similar layout is recorded in all mapping consulted.

See Figure 11-3 OS mapping historic 6" First Edition and Figure 11-4 historic 25" First Edition.



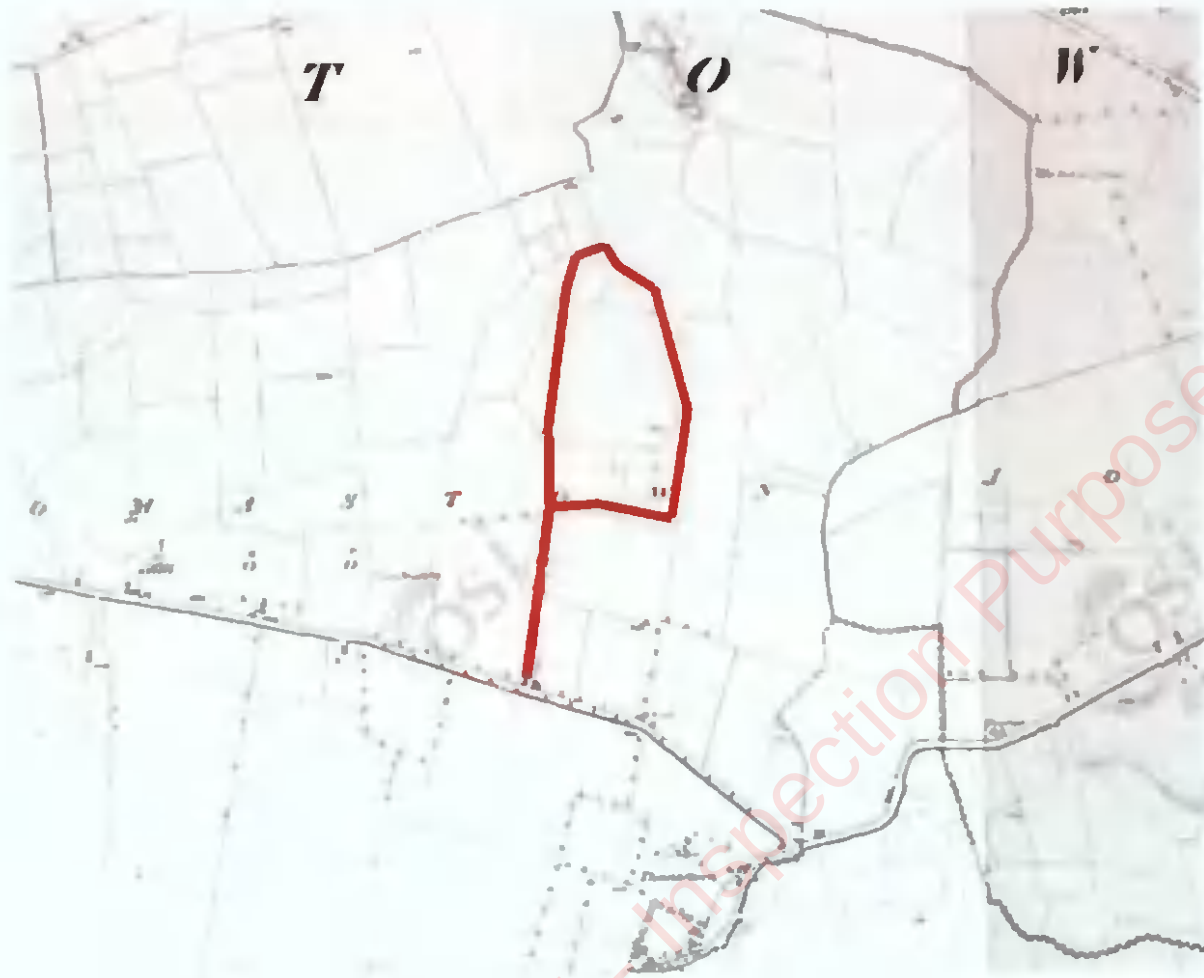


Figure 11-3: First Edition 6-inch Ordinance Survey Map, 1837-1842 with Proposed Development (Red outline)



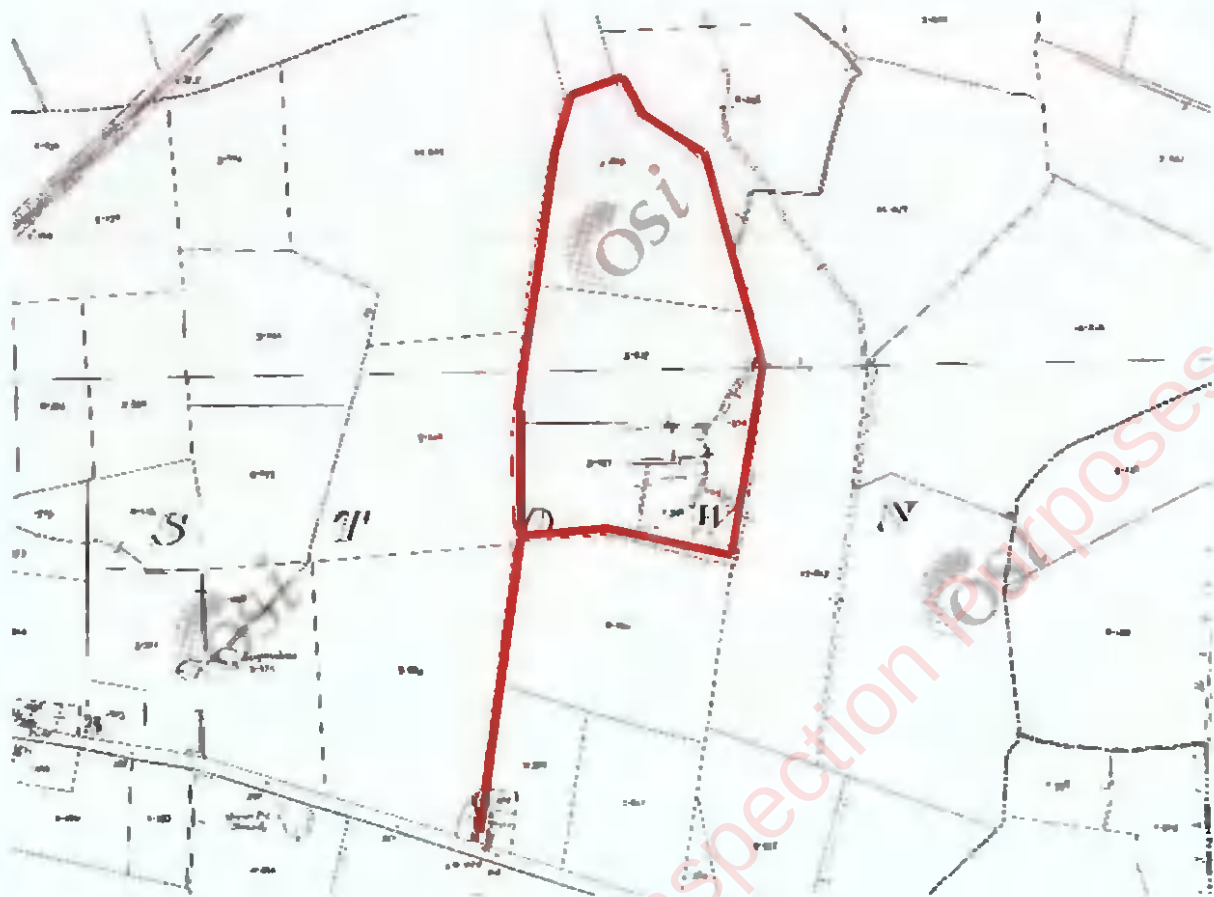


Figure 11-4: First Edition 25-inch Ordinance Survey Map, 1837-1842 with project site (Red outline)

11.4.4 Kildare County Development Plan 2017-2023

The Kildare County Development Plan addresses Architectural Conservation Areas, historic areas and Protected Structures, and recognises the statutory protection afforded to all Records of Monuments and Places (RMP) and all archaeological heritage sites under the National Monuments Legislation (1930-2004), and the development plan lists a number of aims and objectives in relation to archaeological and architectural heritage.

- PS 1: Conserve and protect buildings, structures and sites contained on the Record of Protected Structures of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.
- PS 3: Require that new works will not obscure views of principal elevations of protected structures.

Each of these objectives has been considered and the Proposed Development has been designed in such a way as to fulfil the objectives.

11.4.4.1 Architecture

Protection is also recognised to areas of cohesive architectural value and these areas can be classified as Architectural Conservation Areas (ACA), and any works that may have a material effect on the special character of an ACA needs planning permission. An area can be designated an ACA often because it contains a group of historic buildings or has a distinctive

street size/plot size that contributes to the distinct character of a town or village. In the Kildare area, there are eleven Architectural Conservation Area Locations, as follows:

- Ballitore
- Kilcock
- Maynooth
- Leixlip
- Prosperous
- Rathangan
- Kildare
- Monasterevin
- Moone
- Athy
- Naas

The Proposed Development does not lie within the vicinity of any of the above designated areas.

11.4.4.2 Protected Structures

A protected structure is a structure or part of a structure that a planning authority considers to be a special interest from an "architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest".

In certain circumstances, some archaeological structures may also be considered as architectural heritage, meaning they may therefore appear on both the Record of Monuments and Places (RMP) and the Record of Protected Structures (RPS). These structures are protected by both the National Monuments Acts and the Planning and Development Acts 2000 (as amended).

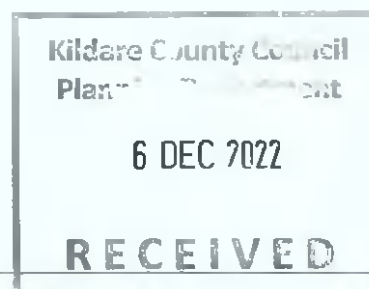
11.4.4.3 Inventory of Architectural Heritage

The National Inventory of Architectural Heritage (NIAH) was reviewed in order to identify any buildings/features of architectural significance within 2km of the Proposed Development Site. The NIAH Registration Number refers to the registration number on the National Inventory of Architectural Heritage building survey of County Kildare. The NIAH is a section within the Department of the Arts Heritage and the Gaeltacht, and the work involves identifying and recording the architectural heritage of Ireland from 1700 to present day Ireland. It is important to note that there may be structures in the NIAH survey that are also included in the RPS, however not all of them are. Seventeen (17 no.) buildings/features of architectural significance are located within 2km of the Proposed Development Site. Information from the National Inventory of Architectural Heritage on these buildings and their features are given below.

Reg. No. 11900305

Townland KILMORE (CADAMSTOWN ED)

Date 1880 - 1920



Original Use House

Categories of Special Interest Architectural, Historical, Social

Description Group of three terraced three-bay single-storey houses with half-dormer attics, c.1900, on a corner site with one retaining original aspect. House to left (east) renovated, c.1970, with single-bay single-storey flat-roofed advanced porch added to centre. House to centre refenestrated, c.1980. Gable-ended roof (shared) with slate (gabled to half-dormer attic windows). Clay ridge tiles (crested to half-dormer attic windows). Rendered chimney stacks. Timber eaves and bargeboards. Cast-iron rainwater goods. Flat-roofed to porch to left (east). Bitumen felt. Timber eaves. Roughcast walls. Painted. Square-headed window openings. Stone sills. Original 2/2 timber sash windows (replacement timber casement windows, c.1980, to house to centre). Replacement timber panelled and glazed timber panelled doors, c.1970-c.1980. Set back from line of road in own grounds on a corner site. Landscaped forecourts to front. Rubble stone boundary wall to front and to side (west).

Distance This is located 1.9km north of the development Site

Impact This site will not be affected by the Proposed Development plans

Reg. No. 11801010

Townland Johnstown (Cadamstown ED)

Date 1890-1920

Original Use Water pump

Categories of Special Interest Artistic Historical Social Technical

Description Freestanding cast-iron waterpump, c.1905, comprising cylindrical shaft with raised horizontal banding, fluted upper section with acanthus leaf detailing to former spout, fluted ogee-domed cap and 'cow-tail' handle having pierced tear drop finial. Now disused with spout now gone. Set back from road on concrete verge.

Distance This is located 1.4km east of the development Site

Impact This site will not be affected by the Proposed Development plans

Reg. No. 11801001

Townland Johnstown (Cadamstown ED)

Date 1710-1715

Original Use Mill (wind)

Categories of Special Interest Architectural Historical Social

Description Freestanding single-bay three-stage rubble stone wind mill, dated 1714, on a circular plan. Now in ruins. Roof now gone (probably originally conical). Random rubble stone



walls (possibly originally rendered). Cut-stone date stone/plaque. Square-headed window openings. Fittings now gone. Pair of square-headed door openings. Fittings now gone. Interior now in ruins with floors and original machinery now gone. Stairway sprockets to wall surface. Set back from road in own grounds.

Distance This is located 1.4km east of the development Site

Impact This site will not be affected by the Proposed Development plans

Reg. No. 11801009

Townland Johnstown (Cadamstown ED)

Date 1810-1830

Original Use Farm house

Categories of Special Interest Artistic Historical Social Technical

Description Detached three-bay two-storey over part-raised basement house, c.1820, retaining early fenestration with prostyle diastyle ionic portico to centre approached by flight of steps and single-bay two-storey lean-to advanced lower return to centre to rear elevation to north-west. Reroofed, c.1970. Hipped roof (lean-to to return). Replacement artificial slate, c.1970. Concrete ridge tiles. Roughcast chimney stacks. Overhanging timber eaves on brackets. Cast-iron rainwater goods. Roughcast walls. Painted. Rendered stringcourse to ground floor. Full-height pilaster strips to front (south-east) elevation. Square-headed window openings (round-headed to return). Stone sills. 3/3 and 6/6 timber sash windows. Round-headed door opening approached by flight of steps. Glazed timber panelled door. Overlight. Prostyle diastyle ionic portico with fluted columns. Set back from road in own grounds. Tarmacadam forecourt to front. Detached five-bay two-storey outbuilding, c.1820, to north-west about a courtyard with segmental-headed integral carriageway. Gable-ended roof with slate. Clay ridge tiles. Red brick chimney stacks. Cast-iron rainwater goods. Roughcast walls. Unpainted. Square-headed window openings. Stone sills. Timber fittings. Segmental-headed integral carriageway. Timber double doors. Detached three-bay single-storey outbuilding, c.1820, at right angles to south-west about a courtyard with segmental-headed integral carriageway. Reroofed, c.1930. Gable-ended roof. Replacement corrugated-iron, c.1930. Iron ridge tiles. Roughcast walls. Unpainted. Square-headed door opening. Timber boarded door. Square-headed integral carriageway to left; segmental-headed integral carriageway to right. Timber fittings. Detached nine-bay two-storey outbuilding, c.1820, at right angles to south-east completing courtyard with door opening to first floor to side elevation to south-east. Gable-ended roof with slate. Clay ridge tiles. Cast-iron rainwater goods. Roughcast walls. Square-headed openings (including door to first floor to side elevation to south-east). Stone sills. Timber fittings. Timber boarded doors. Freestanding cast-iron waterpump, c.1905, to courtyard comprising cylindrical shaft with horizontal banding having part-fluted spout. Cap and handle now gone. Cut-stone trough. Gateway, c.1820, to courtyard comprising pair of piers with wrought iron gate.

Distance This is located 1.5km east of the development Site

Impact This site will not be affected by the Proposed Development plans

Reg. No. 11801008

Townland Johnstown (Cadamstown ED)

Date 1810-1830

Original Use Gates/railings/walls

Categories of Special Interest Architectural Artistic

Description Gateway, c.1820, comprising pair of rendered channelled piers with moulded cornices, rusticated screen walls, rendered terminating piers and cast-iron inner piers having wrought iron double gates and flanking pedestrian gates. Road fronted.

Distance This is located 1.6km east of the development Site

Impact This site will not be affected by the Proposed Development plans

Reg. No. 11801007

Townland Johnstown (Cadamstown ED)

Date 1410-1415

Original Use Monument

Categories of Special Interest Artistic Archaeological

Description Freestanding cross, dated 1412; extant 1837, on ribbon pointed rubble stone pier on chamfered plinth. Road fronted.

Distance This is located 1.7km east of the development Site

Impact This site will not be affected by the Proposed Development plans

Reg. No. 11801016

Townland Johnstown (Cadamstown ED)

Date 1830-1870

Original Use House

Categories of Special Interest Architectural Social

Description Detached five-bay single-storey house, c.1850, probably originally thatched with single-bay single-storey flat-roofed projecting porch to front. Reroofed, c.1930. Refenestrated, c.1990. Hipped roof. Replacement corrugated-iron. Iron ridge tiles. Roughcast chimney stack. Cast-iron rainwater goods. Flat-roof to porch behind blocking course. Materials not visible. Roughcast walls. Painted. Rendered margins to porch. Square-headed openings. Stone sills. Replacement uPVC casement windows, c.1990. Replacement glazed uPVC door, c.1990, with sidelights and overlight. Interior with timber shutters to window openings. Road fronted.

Tarmacadam verge to front. Detached two-bay single-storey outbuilding, c.1850, to north-east. Reroofed, c.1950. Hipped gabled roof. Replacement corrugated-iron, c.1950. Iron ridge tiles. Roughcast walls. Painted. Square-headed openings. Stone sills. Timber fittings. Detached three-bay single-storey rubble stone outbuilding, c.1850, to south-east possibly originally four- or five-bay. Reroofed, c.1950. Gable-ended roof. Replacement corrugated-iron, c.1950. Iron ridge tiles. Rubble stone walls. Painted. Exposed concrete block to side elevation to north-east (possibly dating to period of truncation). Painted. Square-headed openings. Stone lintels. Timber boarded door.

Distance This is located 1.7km east of the development Site

Impact This site will not be affected by the Proposed Development plans

Reg. No. 11801017

Townland Johnstown (Cadamstown ED)

Date 1830-1870

Original Use House

Categories of Special Interest Architectural Social

Description Detached four-bay single-storey house, c.1850, possibly originally thatched with single-bay single-storey lean-to advanced porch to front. Reroofed, c.1930. Refenestrated, c.1980. Hipped gabled roof. Replacement corrugated-iron, c.1930. Iron ridge tiles. Roughcast chimney stack. Cast-iron rainwater goods. Lean-to to advanced porch. Slate. Roughcast walls. Painted. Rendered to porch. Square-headed openings. Stone sills. Replacement timber casement windows, c.1980. Replacement timber panelled door, c.1980. Road fronted. Detached two-bay single-storey rubble stone mono-pitched outbuilding, c.1850, to north-east. Reroofed, c.1930. Mono-pitched roof. Replacement corrugated-iron, c.1930. Cast-iron rainwater goods. Rubble stone walls. Cut-stone quoins. Square-headed openings. Stone sills. Timber fittings. Gateway, c.1900, to north-east with wrought iron double gates having hoop finials.

Distance This is located 1.7km east of the development Site

Impact This site will not be affected by the Proposed Development plans

Reg. No. 11801004

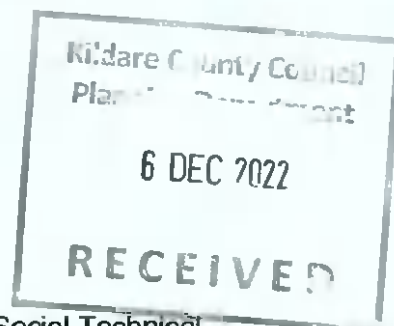
Townland Johnstown (Cadamstown ED)

Date 1820-1840

Original Use Church/chapel

Categories of Special Interest Architectural Artistic Social Technical

Description Detached four-bay double-height rubble stone Gothic-style Catholic church, c.1830, comprising three-bay double-height nave, single-bay double-height chancel to north-west having single-bay single-storey sacristy projection to north-west and entrance bay to



south-east having single-bay three-stage advanced entrance tower to centre with polygonal needle spire. Gable-ended roofs with slate. Clay ridge tiles. Cut-stone coping to gables. Cast-iron rainwater goods. Cut-stone polygonal needle spire to tower behind battlemented parapet. Iron crucifix finial. Roughcast walls to north-east and to south-west over rubble stone construction. Unpainted. Rendered walls to south-east and to north-west elevations. Painted to south-east. Cut-stone dressings including polygonal piers to corners having finials, diagonal stepped buttresses to tower, stringcourse to each stage and battlemented roof parapet having finials. Pointed-arch window openings. Cut-stone sills. Cut-stone surrounds to south-east. Traceried timber fixed-pane windows, some with stained glass panels. Square-headed window opening to second stage of tower with pointed-arch opening over to top stage. Cut-stone sills, surrounds and hood mouldings over. Louvered timber panelled fittings. Pointed-arch door opening. Cut-stone surround. Hood moulding over. Timber panelled double doors. Fanlight. Full-height interior. Carved timber pews. Timber panelled confessional boxes. Tongue-and-groove timber panelled wainscoting to sill level. Wall-mounted cut-stone memorials. Timber panelled gallery to first floor to south-east approached by spiral staircase. Flat plaster compartmentalised ceiling with coved cornice and decorative rosettes. Decorative plasterwork to chancel in Hindu-Gothic style. Replacement altar fittings, c.1975. Set back from road in own grounds. Lawns and tarmacadam carpark to forecourt. Gateway, c.1830, to south-east comprising pair of rendered piers with moulded capping having cast-iron gates and railings.

Distance This is located 1.8km east of the development Site

Impact This site will not be affected by the Proposed Development plans

Reg. No. 11801006

Townland Johnstown (Cadamstown ED)

Date 1810-1820

Original Use School

Categories of Special Interest Architectural Historical Social

Description Detached three-bay single-storey former national school, c.1815, with single-bay single-storey lower end bay to south-west. Extended, c.1980, comprising two-bay single-storey flat-roofed end bay to accommodate part commercial use. Refenestrated, c.1995. Now in residential use. One of a pair. Hipped roofs with slate. Clay ridge tiles. Roughcast chimney stacks. Overhanging timber eaves on brackets. Iron rainwater goods. Flat-roof to additional end bay behind parapet. Bitumen felt. Roughcast walls. Painted. Roughcast parapet wall to additional end bay to south-west. Square-headed openings. Stone sills. Rendered architraves with keystones. Hood mouldings over. Replacement uPVC casement windows, c.1995. Original door opening to side elevation to north-east now blocked-up (concrete block). Replacement timber panelled door, c.1995, to former window opening to south-east. Road fronted. Concrete footpath to front.

Distance This is located 1.8km north east of the development Site

Impact This site will not be affected by the Proposed Development plans



Reg. No. 11801005

Townland Johnstown (Cadamstown ED)

Date 1810-1815

Original Use School

Categories of Special Interest Architectural Historical Social

Description Detached three-bay single-storey former national school, dated 1811. Extended, c.1980, comprising single-bay single-storey flat-roofed end bay to right (north-east) and two-bay single-storey flat-roofed return to rear to north-west. Now in use as training centre. One of a pair. Hipped roof with slate. Clay ridge tiles. Overhanging timber eaves on brackets. Iron rainwater goods. Flat-roof to end bay (behind parapet) and to return. Bitumen felt. Roughcast walls. Painted. Roughcast parapet wall to end bay to north-east. Cut-stone date stone. Square-headed openings. Stone sills (concrete to return). Rendered architraves to original openings with keystones. Hood mouldings over. Replacement timber casement windows, c.1980. Original door opening to side elevation to south-west now blocked-up (concrete block). Timber door to end bay. Overlight. Road fronted. Concrete footpath to front.

Distance This is located 1.8km east of the development Site

Impact This site will not be affected by the Proposed Development plans

Reg. No. 11801003

Townland Johnstown (Cadamstown ED)

Date 1880-1900

Original Use Post box

Categories of Special Interest Architectural Historical Social

Description Wall-mounted cast-iron post box, c.1890, with raised "VR" royal cipher and crown motif. Mounted in rubble stone gate pier at side of road.

Distance This is located 1.8km east of the development Site

Impact This site will not be affected by the Proposed Development plans

Reg. No. 11801019

Townland Johnstown (Cadamstown ED)

Date 1955-1960

Original Use School

Categories of Special Interest Architectural Social



Description Detached six-bay double-height national school, dated 1958, with single-bay single-storey flat-roofed recessed flanking end bays to north-east and to north-west. Renovated and extended, 1987, comprising twelve-bay single-storey double-pile parallel range along rear elevation to north-west. Gable-ended roof with slate (M-profile to parallel range to north-west with artificial slate). Clay ridge tiles. Timber eaves. Iron rainwater goods. Flat-roofed to recessed end bays. Bitumen felt. Roughcast walls. Painted. Cut-stone date stone/plaque. Rendered walls to parallel range to north-west. Square-headed openings. Concrete sills. Replacement timber casement windows, c.1985. Square-headed door opening inserted, c.1985, to front (south-east) elevation. Tongue-and-groove timber panelled door. Overlight. Set back from road in own grounds. Tarmacadam forecourt to front. Roughcast boundary wall to front.

Distance This is located 1.9km east of the development Site

Impact This site will not be affected by the Proposed Development plans

Reg. No. 11801002

Townland Johnstown (Cadamstown ED)

Date 1890-1920

Original Use Water pump

Categories of Special Interest Artistic Historical Social Technical

Description Freestanding cast-iron waterpump, c.1905, comprising cylindrical shaft with raised horizontal banding, fluted upper section with fluted spout, fluted ogee-domed cap and 'cow-tail' handle having finial. Now disused. Set back from road on concrete verge.

Distance This is located 1.9km north east of the development Site

Impact This site will not be affected by the Proposed Development plans

Reg. No. 11801011

Townland Johnstown (Cadamstown ED)

Date 1830-1870

Original Use Bridge

Categories of Special Interest Architectural Historical Social Technical

Description Single-arch cut-limestone road bridge over river, c.1850, with dressed stone voussoirs and rubble stone coping to parapet walls. Coursed snecked limestone walls. Rubble stone coping to parapet walls. Single segmental arch. Cut-stone voussoirs. Rubble stone soffits with traces of render over. Sited spanning Fear English River. Grass banks to river.

Distance This is located 2.0km east of the development Site

Impact This site will not be affected by the Proposed Development plans



Reg. No. 11801012

Townland Gorteen (Dunfieth ED)

Date 1820-1860

Original Use Gate lodge

Categories of Special Interest Architectural Historical Social

Description Detached three-bay single-storey former gate lodge, c. 1840, retaining early aspect with single-bay single-storey gabled projecting porch to centre and single-bay single-storey lean-to lower return to rear to north. Now disused. Gable-ended roof with slate (gabled to porch; lean-to to return). Clay ridge tiles. Red brick chimney stack. Timber eaves and bargeboards. Cast-iron rainwater goods. Rendered walls. Ruled and lined. Unpainted. Square-headed openings. Stone sills. 2/2 timber sash windows. Tongue-and-groove timber panelled door. Set back from road in grounds shared with Metcalfe Park.

Distance This is located 2.0km east of the development Site

Impact This site will not be affected by the Proposed Development plans

Reg. No. 11801018

Townland Gorteen (Dunfieth ED)

Date 1820-1860

Original Use Demesne walls/gates/railings

Categories of Special Interest Architectural Artistic

Description Gateway, c.1840, comprising pair of wrought iron open work inner piers with decorative capping, cast-iron double gates and curved flanking walls having cast-iron railings with spear head finials. Sited off side of road at end of formal avenue with turnaround to west.

Distance This is located 2.0km east of the development Site

Impact This site will not be affected by the Proposed Development plans

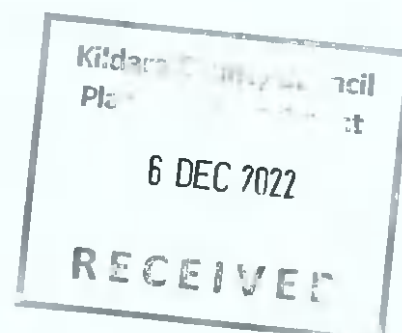




Figure 11-5: NIAH Sites surrounding the Proposed Development

11.4.4.4 Topographical Files

The topographical files of the National Museum of Ireland is a national archive of all known finds that have been recorded by the National Museum, donated in accordance with national monuments legislation. The information on artefact finds have been recorded by the National Museum of Ireland since the late 18th century, and the information obtained from this is important in helping to establish prehistoric and historic activity in the Proposed Development area. Artefacts are the primary files however it also includes references to monuments as well as previous excavations records. A search in the topographical files as well as the National Museum of Ireland finds database (2010) on the Heritage maps online facility produced no results for the development lands and surrounding areas within a 2 km radius.

11.5 Potential Impact of the Proposed Development

11.5.1 Construction Phase

This section assesses the impact of the Proposed Development on the Archaeology and Cultural Heritage of the area during the Construction Phase. The Construction Phase associated with the project will comprise enabling works including limited excavation and regrading of soil for the construction of the impermeable inspection and quarantine area, installation of the Site office and welfare facilities (portacabins), the weighbridge, and the wheel wash. In the event that any archaeological remains are discovered during the Proposed Development, all works will cease and an expert archaeologist will be brought to Site and all

future works will be carried out under the supervision of the archaeologist. This is considered extremely unlikely as the land has been previously excavated.

11.5.2 Operational Phase

The Operational Phase of the Proposed Development will consist of the importation of soil and subsoil from greenfield development sites. No objects or sites of archaeological or cultural importance were identified during the desktop study and as such there is likely to be no significant effects on the archaeological, architectural or cultural heritage of the area through the operations of the Proposed Development.

11.5.3 Potential Cumulative Impacts

In the context of archaeology and cultural heritage impact, no cumulative effects are anticipated from the Proposed Development.

11.5.4 "Do Nothing" Impact

A do-nothing scenario would result in the Site remaining undeveloped. If the Proposed Development were not to proceed, the existing Site would continue to be present.

The land of the current Site is currently of no economic or agricultural value, a 'Do-Nothing' scenario would result in under-utilisation of the landscape in terms of improving the Proposed Development for ecological and agricultural purposes and would be limited in the range of amenity and use.

11.6 Avoidance, Remedial & Mitigation Measures

11.6.1 Construction Phase

There will be no construction or sub-surface works associated with the project.

11.6.2 Operational Phase

Since no known archaeological, architectural or cultural heritage remains were found during the desk top survey as well as the walkover survey, it is likely that there are no further mitigation measures required for this development, however if any archaeological remains are discovered during this project, all works will cease and an expert archaeologist will be brought to Site and all future works will be carried out under the supervision of the archaeologist.

11.6.3 "Worst Case" Scenario

Worst case scenario would involve failures of mitigation measures for the Proposed Development. In the event of this Site, as there are no construction or sub-surface works associated with the development plans, it is not anticipated that any mitigation measures will be required.

11.7 Residual Impacts

No negative residual impacts in the context of archaeology and cultural heritage are anticipated regarding this Proposed Development.

11.8 Monitoring

No specific monitoring measures are required in relation to archaeology and cultural heritage for the Proposed Development (see 11.6 above) as there are no sub-surface works associated with the development plans. Therefore, the only specific monitoring requirements will be that which comply with the proposed Waste Facility Permit, subject to grant of the planning application by Kildare County Council.

11.9 Interactions

Interactions between Archaeology and Cultural Heritage and other aspects of this Environmental Impact Assessment Report have been considered and are detailed below.

11.9.1 Landscape and Visual

It is not predicted that any changes in landscape or visual amenities will affect in any way the archaeology and cultural heritage of the area. The Site will be infilled with imported inert waste materials to restore the Site to agricultural use. As there are no known archaeological or architectural remains found during the desk top survey as well as the walkover survey, it is not predicted that any changes in landscape or visual impact will affect in any way the archaeology of the area.

11.9.2 Land and Soil

The Proposed Development will involve enabling works including limited excavation and regrading of soil. There is potential for previously unrecorded archaeological features or deposits to be discovered during this process. This is considered extremely unlikely as the land has been previously excavated and no objects or sites of archaeological or cultural importance were identified during the desktop study.

11.10 Difficulties Encountered When Compiling

There were no difficulties in compiling the specified information with regard to archaeological, architectural and cultural heritage.

11.11 References

Archaeological Survey Database, available at:
<http://webgis.archaeology.ie/historicenvironment/>

Department of Arts, Heritage, Gaeltacht and the Islands (1999b). Policy and Guidelines on Archaeological Excavation. Dublin. Government Publications Office.

National Monuments of Ireland database available at:
<http://webgis.archaeology.ie/historicenvironment/>

National Inventory of Archaeological Heritage, available at:
<http://www.buildingsofireland.ie/Surveys/Buildings/>

OSI mapping (www.osi.ie)

<https://heritagemaps.ie/WebApps/HeritageMaps/index.html>

Kildare County Development Plan 2017-2023

Kildare County Development Plan 2023-2029

www.excavations.ie

12 MATERIAL ASSETS: TRAFFIC, WASTE AND UTILITIES

12.1 Traffic

12.1.1 Introduction

Transport Insights has been commissioned by Enviroguide Consulting, on behalf of Mr. PJ Doran, to prepare an Environmental Impact Assessment Report (EIAR) Traffic and Transport Chapter in relation to the proposed infill development at Johnstownbridge, County Kildare.

12.1.1.1 Competency of Chapter Authors

The Traffic and Transportation Chapter of the EIAR was prepared by Eoin Munn as Project Director and Seán Byron as Consultant Transport Planner (both of Transport Insights Limited). Details of their experience and qualifications are provided within the following table.

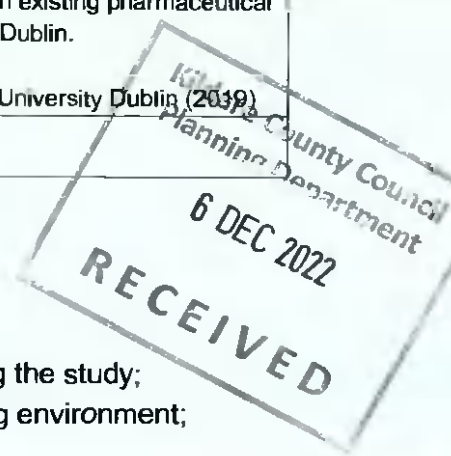
Table 12-1: Competency of Chapter Authors

Reviewer	Eoin Munn
Title	Director (Project Director)
Relevant Experience and Qualifications	<u>Experience</u> Over 10 years' experience working within Transport Planning and Engineering, including project management of a variety of small to medium sized projects from feasibility to detailed design stage. Recent EIAR experience includes undertaking Traffic and Transport Assessments for an anaerobic digestion facility in Co. Waterford and a waste treatment facility in Co. Dublin. <u>Qualifications:</u> • BSc Transport Operations, Technological University Dublin (2003-2007) • MSc Business Analytics, University College Dublin (2007-2008)
Professional Membership	• Member, Transport Planning Society (MTPS)
Principal Author	Seán Byron
Title	Consultant Transport Planner (Project Manager)
Relevant Experience and Qualifications	<u>Experience:</u> Consultant Transport Planner <u>Experience:</u> 4 years' experience working within Transport Planning and Engineering, on a variety of public and private sector projects. Recent EIAR experience includes the expansion of an existing pharmaceutical plant and a proposed waste treatment facility both in Dublin. <u>Qualifications:</u> • B.Eng (Hons) in Civil Engineering, Technological University Dublin (2019)
Professional Membership	• Member, Transport Planning Society (MTPS)

12.1.1.2 Contents

The remainder of the chapter is structured as follows:

- Section 12.1.2 outlines the methodology pursued in undertaking the study;
- Section 12.1.3 describes the Proposed Development's receiving environment;



- Section 12.1.4 outlined the key traffic and transport related characteristics of the Proposed Development;
- Section 12.1.5 outlines potential construction and operational phases' traffic impacts arising from the Proposed Development;
- Section 12.1.6 details any avoidance, remedial & mitigation measures;
- Section 12.1.7 addresses any residual impacts;
- Section 12.1.8 addresses any monitoring measures;
- Section 12.1.9 states any interactions between the information presented in this EIAR Chapter and any other areas addressed as part of the EIAR;
- Section 12.1.10 states any difficulties in compiling the information set out within this chapter; and
- Section 12.1.11 provides a list of references.

12.1.2 Study Methodology

This section of the EIAR outlines the methodology followed in order to carry out the Traffic and Transport Assessment set out within this Chapter. The approach pursued in undertaking the Assessment has been guided by and is consistent with the national best practice, namely Transport Infrastructure Ireland's (TII's) Traffic and Transport Assessment Guidelines (May 2014).

The existing conditions on the surrounding road network were further informed by a 24-hour classified automatic traffic count survey of the L5014, to the immediate east of the existing site access. The survey was undertaken on Tuesday 17 May 2022. The survey results were then used to establish a baseline from which to predict traffic growth on the local road network. The Do-Nothing scenario, the scenario in which the Proposed Development does not proceed was established for the YoO (Year of Opening), YoO +5 years and YoO + 15 years. This was then compared to Do Something scenario which applies the potential development traffic to the local road network in the YoO, YoO+5 and YoO +15.

A first principles approach to development traffic generation was completed, taking into consideration material inputs to site and anticipated staffing levels. The results of this analysis were then used to predict the impact of the Proposed Development on the local road network.

A comprehensive list of guidance documents that have informed specific parts of the Assessment is set out in Section 12.1.11 of this EIAR Chapter.

12.1.3 The Receiving Environment

12.1.3.1 Site Location

The Proposed Development site is located to the north of L5014, ca. 2.2 kilometres to the west of Johnstown Bridge, Co. Kildare. The R402 is located approximately 600 metres to the east of the subject site and M4 junction 9 is located ca. 3.2 kilometres to the northeast. The area surrounding the site is a primarily agricultural in nature, with low density residential development also present.



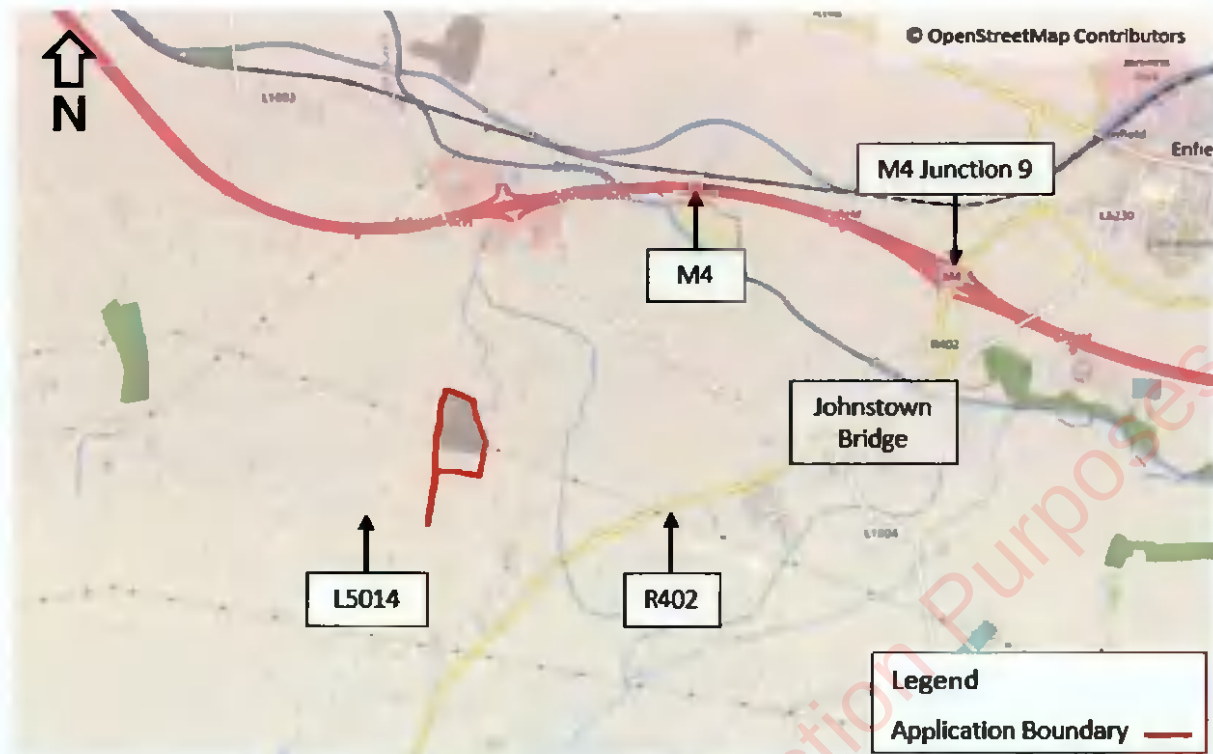


Figure 12.1 Proposed Development Site Location

12.1.3.2 Existing Site Access

The site is currently accessible at 1 no. location. This access is via an existing established agricultural access from L5014 to the south of the subject site and leads to an existing access road which connects L5014 to the subject lands. The location of the existing access is shown in the following Figure 12.2 with the existing site access illustrated in Figure 12.3.





Figure 12.2: Existing Site Access Arrangements



Figure 12.3: Existing Site Access

12.1.3.3 Existing Site Layout

The site is understood to comprise a disused quarry. There are no buildings or other elements of note contained within the existing site.

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12.1.3.4 Local Road Network

The layout of the local road network in the proximity of the Proposed Development site is shown in Figure 12.1. The technical characteristics, layout and operation of these roads are described further in the following sections.

12.1.3.4.1 L5014

The L5014 is a two-way local road that runs in an approximately east-west alignment to the south of the subject site between the R402 at its eastern end to the eastern boundary of the Moyvalley Golf Club at its western end intersecting the L1003 at the 4-arm L1003/L5014 stop-controlled junction approximately 2.1 kilometres to the west of the subject site.

In the vicinity of the subject site, the carriageway width of the L5014 is ca. 5.0 metres wide incorporating a single lane in each direction. L5014 has a straight horizontal alignment and a flat vertical alignment adjacent to the site. The posted speed limit on L5014 in the vicinity of the site is 80 km/h, decreasing to 60 km/h at its eastern end in the vicinity of the 3-arm R402/L5014 stop-controlled junction.

There are no road markings on L5014 in the vicinity of the site save for yellow broken line markings which delineate the vehicular carriageway. In the vicinity of the 3-arm R402/L5014 stop-controlled junction, warning signage is provided on approach to junctions as is a solid white road centreline and STOP road markings.



Figure 12.4: L5014

12.1.3.4.2 R402

The R402 is a two-way regional road that connects the 3-arm R148/ R402 roundabout junction in the vicinity of Enfield at its northern end to the 3-arm R402/R420 3-arm junction at its southern end. The R402 links the proposed subject site, via the L5014, to M4 Junction 9 to

the north of Johnstown Bridge. The R402 also runs through the built-up area of Johnstown Bridge and incorporates the main street of the town.

The R402 typically incorporates a single traffic lane in each direction and is 7.0 metres to 8.0 metres wide in the vicinity of the R402/L5014 3-arm stop-controlled junction and is divided by a solid or broken white centreline, depending on the location.

The posted speed limit on the R402 to the west of the site is 80 km/h which decreases to 50km/h as it passes through Johnstown Bridge. Pedestrian infrastructure is provided in the vicinity of Johnstown Bridge and it is also noted that traffic calming measures such as 'SLOW' road markings and ramps are present on the R402 within the built-up area of Johnstown Bridge.



Figure 12.5: R402

12.1.3.4.3 R402/L5014 3-arm Stop-Controlled Junction

The 3-arm R402/ L5014 stop-controlled junction is located ca. 600 metres to the east of the subject site and is the primary means by which the site is accessed from the local and national road network. On approach to the junction from the northern arm, the vehicular carriageway widens in order to accommodate a right-hand turning lane from the southbound lane of the vehicular carriageway. The 3-arm junction is illustrated in Figure 12.6 which follows.





Figure 12.6: R402/L5014 3-arm Stop-Controlled Junction

12.1.3.4.4 M/N4

The M/N4 motorway/ national road connects Sligo Town, Sligo to M50 Junction 7 at Palmerstown, Dublin. The majority of the route is designated as a national road, with the section between Dublin and Kinnegad designated as motorway. The M/N4 provides a direct connection to the wider primary road network via the M50 at Dublin and the M6 at Kinnegad which connects to the major centres of Athlone and Galway City.

12.1.3.5 Existing Traffic Flows

To determine baseline traffic conditions on the L5014 adjacent to the Proposed Development site, a 24-hour classified Automatic Traffic Count (ATC) survey was undertaken on Tuesday 17 May 2022.

Full traffic survey data is included in Appendix C of this document. A summary of the survey results for the AM and PM peak hours and total survey period as ascertained from the survey data is presented in the following Table 12-2.

Table 12-2: ATC Survey Results Summary (Approach Flows)

Time Period / Direction	L5014 (Westbound)		L5014 (Eastbound)		L5014 (Total)	
	Total	Of which HV	Total	Of which HV	Total	Of which HV
AM Peak Hour (08:30 - 09:29)	22	1	31	2	53	3
PM Peak Hour (16:15 - 17:14)	43	3	20	0	63	3
Total 24-hour	327	11	332	15	659	26

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Based on the results of the traffic surveys set out in the preceding Table 12-2, the local road network peak hours, in terms of maximum flow were identified to be 08:30 - 09:29hrs (AM Peak), and 16:15 - 17:14hrs (PM Peak).

The results of the traffic survey have been used to establish a baseline from which to predict traffic volumes on the local road network for the Proposed Development's assumed YoO, YoO +5 and YoO +15.

12.1.3.5.1 Annual Average Daily Traffic (AADT)

In order to understand the existing traffic flows on the local road network and establish a baseline to assess the traffic impact of the development proposals, it is first necessary to establish future levels of background traffic. The survey data summarised in preceding sections was expanded in accordance with TII's *Project Appraisal Guidelines for National Roads Unit 16.1 - Expansion Factors for Short Period Traffic Counts - PE-PAG-02039* (October 2016), to derive Annual Average Daily Traffic (AADT) on the local road network.

The following Table 12-3 outlines the expansion factors used in expanding the survey data to AADT using data for the 'Mid-East' Region.

Table 12-3: 24-hour, WADT and AADT factors

Variable	Day of Week	Month of Year
Data Recorded	Tuesday	May
Factor	0.97 (WADT factor)	0.98 (AADT factor)

Based on the recorded two-way 24-hour traffic flows, weekly average daily traffic (WADT) and AADT have been calculated using the factors in Table 12-3. AADT data for roads in the vicinity of the site are presented in the following Table 12-4.

Table 12-4 - AADT Traffic Data

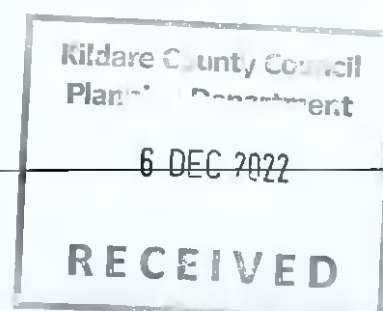
Road Link	AADT		
	Total Vehicles	Of which Heavy Vehicles	% HGV
L5014	311	10	3.4%

The data set out in Table 12-4 is used in Section 12.1.5 as a baseline in order to assess the impact of the Proposed Development under the different prescribed scenarios.

12.1.4 Characteristics of the Proposed Development

12.1.4.1 Site Access

The Proposed Development will be accessed via the existing entrance point from the L1522 illustrated by Figure 12.2. This access leads to a ca. 260 metres long access road which is used to access the main body of the site.



In relation to HV access arrangements, the site entrance priority junction features an access road which is ca. between 4.72 metres and 2.32 metres wide. It should be noted that this entrance is currently gated.

12.1.4.2 Proposed Site Layout

The Proposed Development a total area of 7.42 ha and includes;

- 2 no. fill areas, totalling 3.65 ha;
- a site access road;
- a wheelwash;
- site office and welfare facilities;
- 4 no. car parking spaces; and
- a weighbridge.

An illustration of the proposed site layout is provided in Figure 12.7 with additional information in relation to proposed site infrastructure and site access arrangements provided in Figure 12.8 and Figure 12.9 respectively.

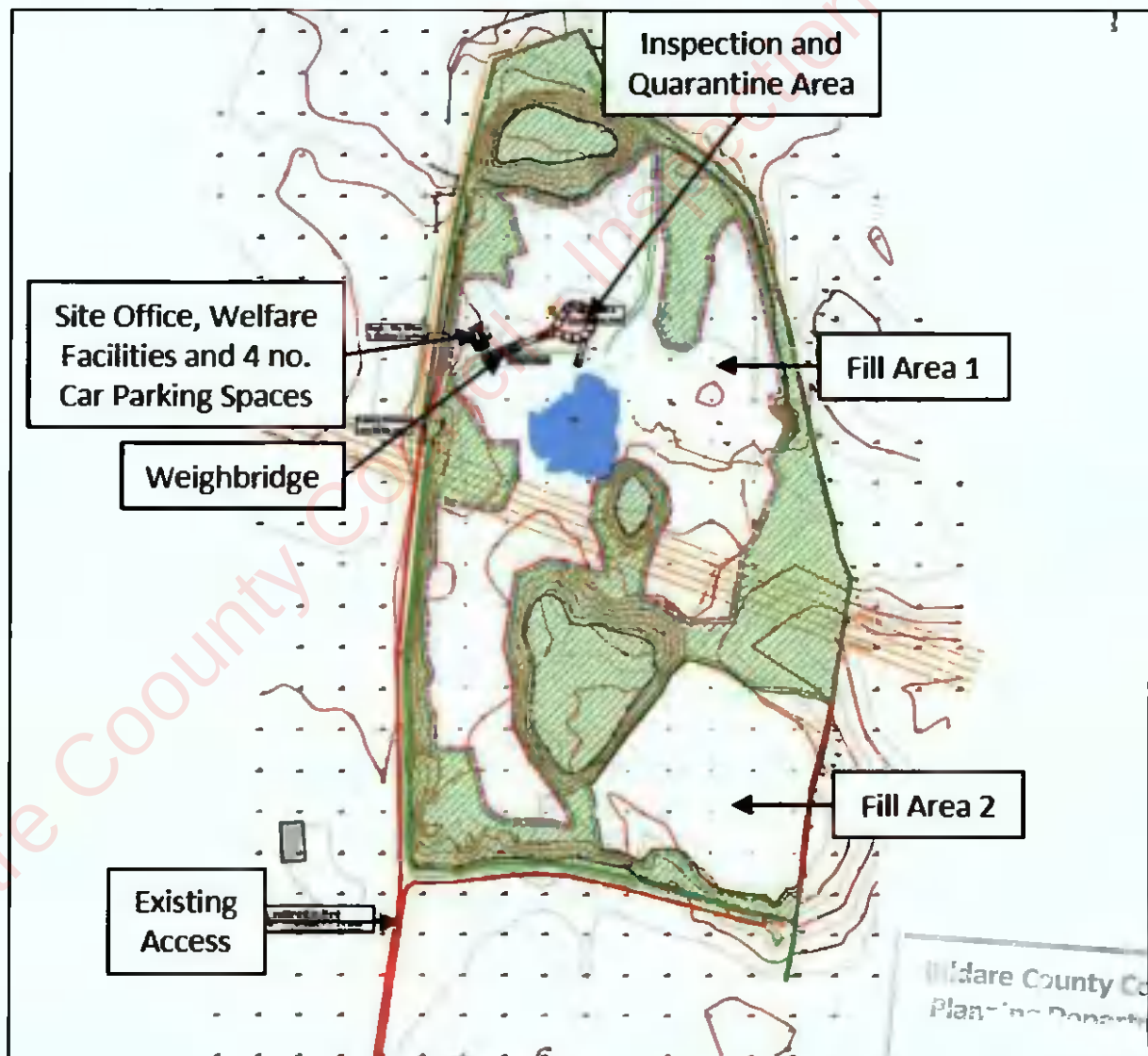


Figure 12.7: Proposed Site Layout



Figure 12.8: Site Facilities, Car Parking, Weighbridge and Inspection and Quarantine Area

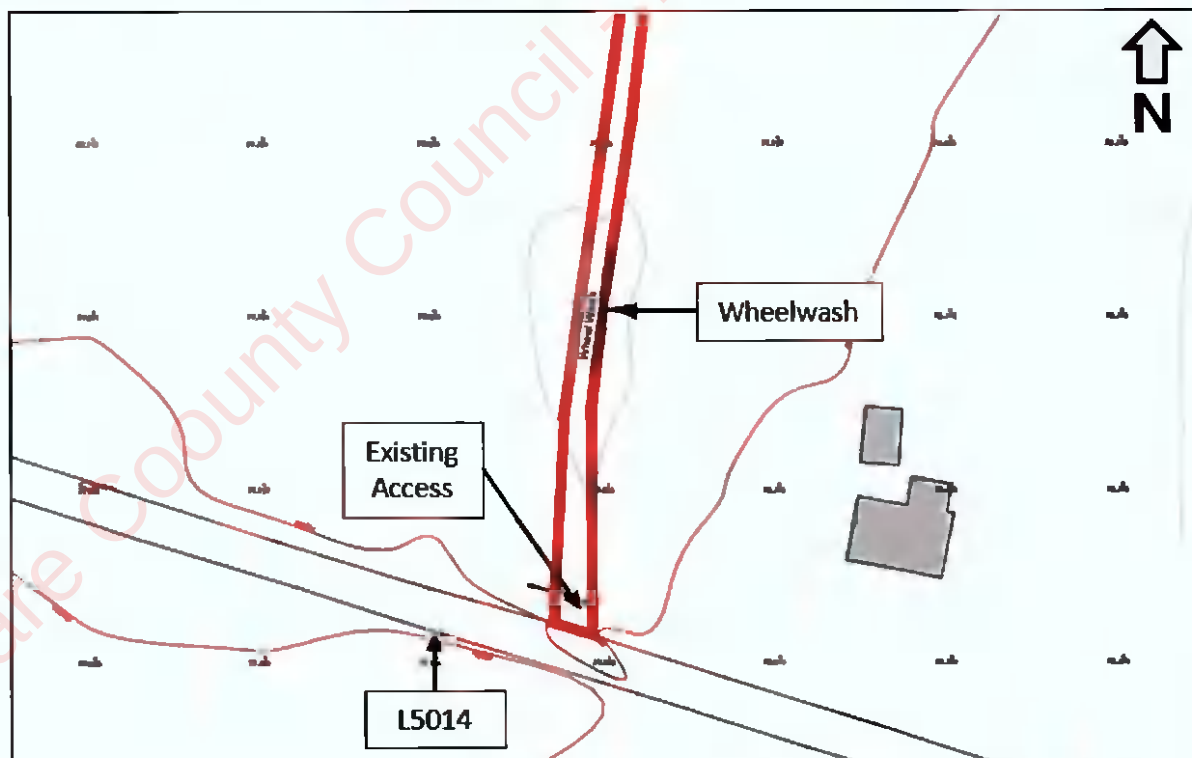


Figure 12.9: Operational Site Access Arrangements including Wheelwash Facility

As part of the Proposed Development, all vehicles with access the Proposed Development site via the access illustrated in Figure 12.9. Light vehicles will proceed to the designated car parking area and heavy vehicles will proceed to the weighbridge and inspection and quarantine area, illustrated in Figure 12.8. Heavy vehicles will unload at the fill areas and turn to egress the site via the site access junction.

12.1.5 Potential Impact of the Proposed Development

12.1.5.1 Construction Phase

Works required to enable site operations are minimal. This includes the transportation of a prefabricated building to site which will form the site office and welfare facilities and the construction of a weighbridge and 4 no. car parking spaces. Given the short temporary nature of the construction phases, the characteristics of the local road network, the impact of the estimated construction traffic is expected to be minimal.

12.1.5.2 Operational Phase

12.1.5.2.1 Assessment Scenarios and Years

The potential traffic and transportation impacts of the Proposed Development is assessed by reference to the number of vehicle trips that it is envisaged to generate, and for the purposes of this assessment, two separate scenarios will be analysed and their impacts reported. These scenarios are as follows;

- The **Do-Nothing scenario** will reflect traffic on the surrounding road network factored up to reflect forecast background growth over time.
- The **Do-Something scenario** builds on the Do Nothing scenario and includes the assessment of expected development related traffic on the surrounding road network. This is considered the 'worst case' scenario.

These scenarios will detail the traffic impacts for the following years. It should be noted that the Proposed Development has a 5-year lifespan and is envisaged to begin at a point in 2023 and end at a point in 2028 at which point the traffic generated by the Proposed Development will be removed from the local road network;

- YoO (2023);
- YoO (2028); and
- YoO +15 (2038).

Background traffic is factored up as per TII's *Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections - PE-PAG-02017* (October 2021) central growth factors for Co. Kildare. These factors are set out in the following Table 12-5.

Table 12-5 - Annual traffic growth factors - Kildare

Central Growth Rates			
2016-2030		2030-2040	
LV	HV	LV	HV
1.0197	1.0378	1.0062	1.0155

12.1.5.2.2 Operational Period

During the operational period, 2 no. staff are expected to be present on site with core work hours as follows;

- 08:00hrs to 18:00hrs - Monday to Friday
- 08:00hrs to 14:00hrs - Saturday

This equates to an estimated approximately 305 no. operational days per year, with a week-long break in site activities during Christmas week.

12.1.5.2.3 Development Traffic Generation

The Proposed Development is expected to generate a limited number of additional traffic movements on the local network. Based on the number of staff expected to work on site i.e. 2 no., a total of 4 no. staff trips are generated i.e. two LV trips per staff member each day.

Regarding HV movements, the subject application is for the intake of up to 128,461 tonnes of material over its 5-year lifetime with an average tonnage per annum (tpa) of 25,692 tonnes of material. It is noted that deliveries to site will arrive via rigid and articulated HGVs with an arrival payload of 26.5 tonnes each. This equates to an average of ca. 3.5 HVs per day arriving to site. In the interest of providing a robust assessment, it has been assumed that in the worst-case scenario, 8 no. HGV's will arrive to site per day, ca. 1 no. HGV per hour.

The expected operational vehicle movements at the subject site are outlined in the following Table 12-6. Note that a visitor trip (LV) has also been included in order to provide a conservative estimate.

Table 12-6: Proposed Development Traffic

	One-way Flow	Two-way Flow
Staff (LVs)	2	4
Visitor (LVs)	1	2
HV's	8	16
Total	11	22

12.1.5.2.4 Haulage Routes

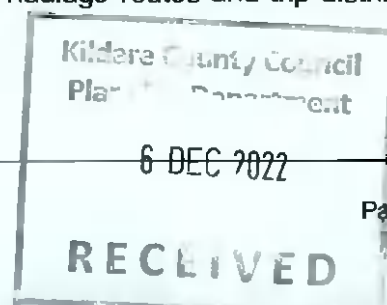
All heavy vehicles will access and egress the site via the following route;

- Depart the M4 at Junction 9 – south on the R402 before turning west onto the L5014 – accessing the site via the existing site access junction from the L5014.
- Vehicles will follow the reverse route back to the M4 when egressing the site.

12.1.5.2.5 Trip Distribution

It is anticipated that 100% of traffic including HV traffic will access and egress the site the route outlined in Section 12.1.5.2.4.

Figure 12.10 provides a graphical representation of HV haulage routes and trip distribution patterns to/ from the Proposed Development.



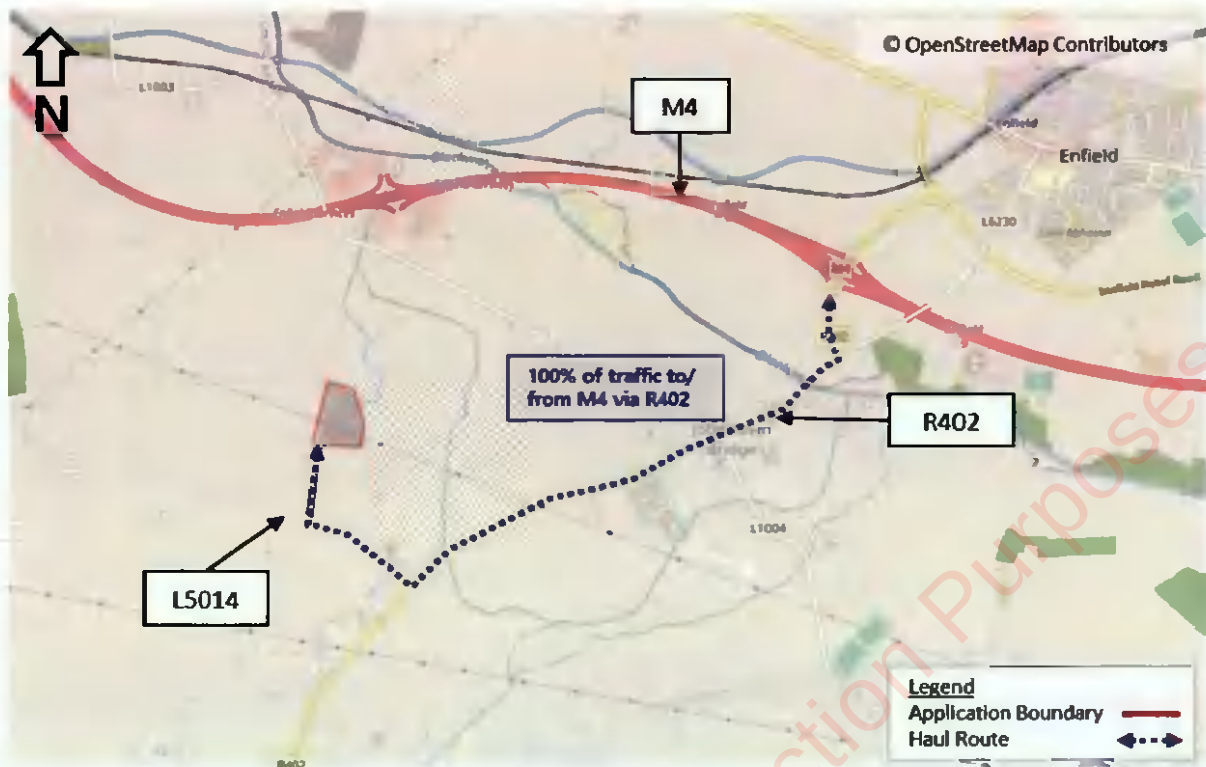


Figure 12.10 - Haulage Route and Trip Distribution

12.1.5.2.6 Do-Something Traffic Forecast

Table 12-7 details the total AADT and proportion of which comprises HVs on L5014 Glenville Road for the Do-Something scenario. The Do Something scenario considered the worst-case scenario, whereby the Proposed Development traffic outlined in Section 12.5.2.3 are assessed in addition to the factored up background traffic for the year of opening (2023), year of opening + 5 Years (2028), and year of opening + 15 Years (2038).

Table 12-7 – Do-Something Scenario Forecast Traffic Volumes on L5014

Year	Total AADT	Of which, HV	%HV	% AADT Increase over Do-Nothing Scenario within Table 12-8
2023	339	27	7.9%	6.9%
2028	373	29	7.8%	6.3%
2038	385	16	4.1%	0.0%

The figures set out in Table 12-7 show that within the Do-Something scenario, traffic volumes on the L5014 in the development's assumed year of opening (2023) are expected to increase by 6.9%. This will decrease to 6.3% to the Year of Opening + 5 (2028), the final year of the facility's operation at which point all traffic will be removed from the local road network and the percentage increase in AADT due to the Proposed Development will revert to 0.0% to the Year of Opening +15 (2038). It should also be noted that the percentage AADT increases outlined above demonstrate the percentage impact of the Proposed Development at a point to the east of the site access junction where all development traffic will pass.

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Section 2.1 of TII's Traffic and Transport Assessment Guidelines (May 2014) sets out thresholds for production of a Traffic and Transport Assessment, with thresholds for developments provided in Table 2.1. It is noted from Table 2.1 that where "traffic to and from the development exceeds 10% of the traffic flow on the adjoining road", more detailed analysis of a Proposed Development's traffic impacts may be required. The Proposed Development will result in an increase on the L5014, significantly below the 10% threshold.

12.1.5.3 Do Nothing Impact

The Do-Nothing impacts of the Proposed Development are based on the appropriately factored up background traffic. In this scenario, the site remains in its current state and thus generates no additional traffic.

Table 12-8 details the total AADT and proportion of which comprises HVs on the L5014 in the Do-Nothing scenario for the year of opening (2023), year of opening + 5 Years (2028) and year of opening + 15 Years (2038).

Table 12-8 – Do-Nothing Scenario Forecast Traffic Volumes on L5014

Year	Total AADT	Of which, HV	%HV
2023	317	11	3.4%
2028	351	13	3.7%
2038	385	16	4.1%

Table 12-8 provides a baseline from which the Proposed Development's traffic impacts have been determined, with the outputs of that analysis presented in Table 12-7.

12.1.6 Avoidance, Remedial & Mitigation Measures

12.1.6.1 Construction Phase

As part of the construction phase, a number of mitigation measures are proposed. These are as follows;

- In order to minimise the potential impact on the local road network surfaces, a wheel-wash facility will be provided during the construction phase to mitigate against material such as dust, earth, debris etc. from entering the local road network.
- Staff vehicles within the bounds of the subject site, in which there is ample room for parking of vehicles, in order to mitigate against the overspill of parking to the local road network.
- Haul routes outlined within 12.1.5.2.4 will be strictly adhered to by construction vehicles.

12.1.6.2 Operational Phase

As part of the operational phase, several mitigation measures are proposed, which are as follows;

- In order to minimise the potential impact on the local road network surfaces, a wheel-wash facility will be provided during operational phase to mitigate against material such as dust, earth, debris etc. from entering the local road network.

- Haul routes outlined within 12.1.5.2.4 will be strictly adhered to by site vehicles.
- The required sightlines of 160 metres are achievable in both directions to ensure adequate visibility of drivers egressing the site of oncoming traffic.

12.1.6.3 "Worst Case" Scenario

The worst-case scenario in terms of traffic and transportation, is the scenario which operations at the Proposed Development site have the capacity to generate the greatest amount of traffic on the surrounding road network. To provide a robust basis for this assessment, the Do-Something scenario analysed above represents the worst-case scenario.

12.1.7 Residual Impacts

The predicated residual impact of the Proposed Development in terms of traffic and transportation is that there will be a marginal short-term increase in HVs on the adjoining road network due to the operation of the Proposed Development. There will be no long-term residual impacts resulting from the Proposed Development.

12.1.8 Monitoring

12.1.8.1 Construction Phase

As outlined above, construction works required to enable site operations are minimal. Given the short temporary nature of the construction phases, the characteristics of the local road network, the impact of the estimated construction traffic is expected to be minimal. However, the local road network in the vicinity of the site will be monitored during the construction and operational phases, with regular observations of the local road network. Should monitoring indicate any excess mud or debris on the road, a road sweeper can be organised (if required) to clean the surface.

12.1.8.2 Operational Phase

There are no monitoring measures proposed for the operational phase.

12.1.9 Interactions

12.1.9.1 Noise and Vibration

The analysis contained within this chapter interacts with the Noise Assessments contained within this EIAR. This is primarily due to the potential for an increase in HV traffic movements on the surrounding road network due to development.

12.1.10 Difficulties Encountered When Compiling

No difficulties were encountered when compiling this EIAR Chapter.

12.1.11 References

The EIAR Traffic and Transport Assessment has been prepared taking into account the following policy and technical guidance documents:

- The requirements of EU Directives and national legislation (primary and secondary) concerning Environmental Impact Assessment (especially having due regard to the revised provisions of Directive 2014/52/EU);

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- EPA (2003) Advice Notes on Current Practice in the Preparation of Environmental Impact Statements;
- EPA (August 2017) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports;
- DHPCLG (May 2017) Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems: Key Issues Consultation Paper;
- Kildare County Development Plan 2017 – 2023;
- Draft Kildare County Development Plan 2023 – 2029;
- Transport Infrastructure Ireland (TII) (2014) Traffic and Transport Assessment Guidelines;
- Transport Infrastructure Ireland (TII) Project Appraisal Guidelines for National Roads Unit 16.1 - Expansion Factors for Short Period Traffic Counts (October 2016);
- Transport Infrastructure Ireland (TII) Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (October 2021);
- Transport Infrastructure Ireland (TII) Rural Road Link Design Standards (April 2017); and
- Transport Infrastructure Ireland (TII) Guidance on Minor Improvements to National Roads (including Erratum No. 1, dated April 2013 and Erratum No. 2, dated June 2013) (March 2013).



12.2 Waste and Utilities

12.2.1 Introduction

Material Assets have been defined as 'Resources that are valued and that are intrinsic to specific places, they may be either human or natural origin and the value may arise for either economic or cultural reasons' (EPA 2002).

The definition of Material Assets was further expanded by the EPA in 2022 in 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' which states:

'In Directive 2011/92/EU this factor included architectural and archaeological heritage. Directive 2014/52/EU includes those heritage aspects as components of cultural heritage. Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes roads infrastructure. Sealing of agricultural land and effects on mining or quarrying potential come under the factors of land and soils.'

The scope and definition of Material Assets within the context of the EIA process has been defined by the EIA Directive as including Architectural and Archaeological Heritage or Cultural Heritage. These elements are assessed separately in Chapter 11 under Archaeology & Cultural Heritage.

This Chapter of the Environmental Impact Assessment Report (EIAR) provides an assessment of the potential impacts of the Proposed Development on Material Assets or physical resources in the environment of human origin including built services and infrastructure comprising:

- Electricity Supply,
- Gas Supply,
- Information and Communications Technology,
- Surface Water Drainage Infrastructure,
- Water Supply and Demand,
- Wastewater Management, and
- Waste Management

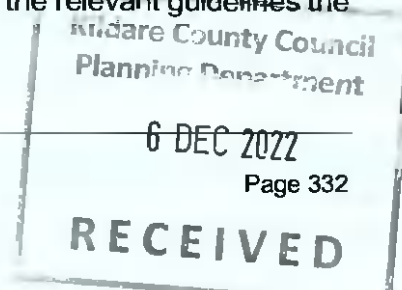
Natural resources (water, land, biodiversity, air, etc) are addressed in their respective Chapters.

12.2.1.1 Quality Assurance and Competence

This Chapter was prepared by Enviroguide Senior Environmental Consultant Nikita Coulter. Nikita Coulter has a B.Sc. in Zoology (Hons) from University College Dublin, an M.Sc in Biodiversity and Conservation and a Postgraduate Diploma in Environmental Engineering from Trinity College Dublin, and a NEBOSH accredited International Diploma in Environmental Risk Management. Nikita has 8 years professional experience as an Environmental Compliance Specialist.

12.2.2 Study Methodology

The methodology adopted for the assessment takes cognisance of the relevant guidelines the following:



- Environmental Protection Agency (EPA) (2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)
- EPA (2003) Advice Notes on Current Practice in the preparation of Environmental Impact Statements.
- EPA (2002) Guidelines on the information to be contained in Environmental Impact Statements.

The scope of work undertaken for the assessment included a desk-based study of material assets, namely built services, utilities and infrastructure associated with the existing Site and the Proposed Development. All phases of the Proposed Development were considered in the assessment of potential impacts on material assets.

Information on built assets in the vicinity of the Site of the Proposed Development was assembled by the following means:

- A desktop review of ESB Networks Utility Maps, Irish Water Utility Plans, Gas Networks Ireland Service plans. EIR E-Maps.

12.2.2.1 Prediction and Assessment of Impacts

Impacts were predicted and assessed based on EPA guidance and by using the definitions detailed in Tables 12-9, 12-10 & 12-11. Impact will vary from negative to neutral or positive, and also will vary in significance on the receiving environment. The terminology and methodology used for assessing the impact significance and corresponding effects throughout this Chapter are described in Tables 12-9, 12-10 & 12-11:

Table 12-9: Terminology used to assess the quality potential impacts & effects

Quality of Effects / Impacts	Definition
Negative	A change which reduces the quality of the environment.
Neutral	No effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error.
Positive	A change that improves the quality of the environment.

Source: EPA, 2022



Table 12-10: Terminology used to assess the significance of potential impacts & effects

Significance of Effects / Impacts	Definition
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.

Source: EPA, 2022

Table 12-11: Terminology used to assess the duration of potential impacts/effects

Duration of Effects / Impacts	Definition
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting one year or less
Short-term	Effects lasting one to seven years
Medium-term	Effects lasting seven to fifteen years
Long-term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration

Source: EPA, 2022

Where significant potential impacts were identified, mitigation measures are proposed to minimise impacts.

In line with the EPA Guidelines (EPA, 2022), the terms in Table 12-12 are defined when quantifying the extent and context of effects. and the terms in Table 12-13 are defined when quantifying the probability of effects.

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Table 12-12: Definition of the Extent and Context of Effects

Quality	Definition
Extent	Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)

Source: EPA, 2022

Table 12-13: Definition of the Probability of Effects

Quality	Definition
Likely Effects	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.

Source: EPA, 2022

Figure 12-11 (extracted from the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, 2022) shows how the character of the predicted impact in relation to the sensitivity of the receiving environment can determine the significance of the impact.



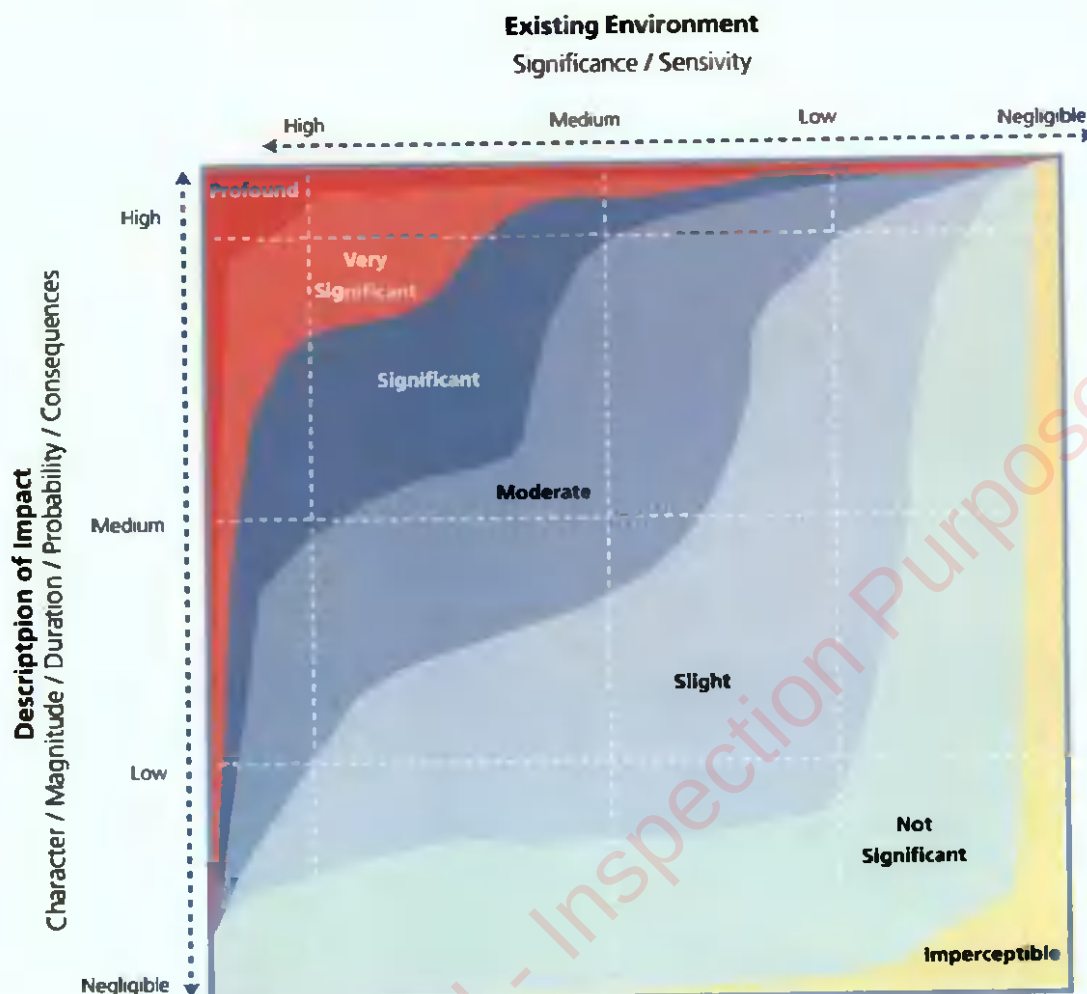


Figure 12-11 Chart showing typical classifications of the significance of impacts (EPA, 2022, Guidelines on the Information to be Contained in Environmental Impact Assessment Reports)

12.2.3 The Existing and Receiving Environment (Baseline Situation)

12.2.3.1 Site Location

The Proposed Development is situated in the Townland of Thomastown in the Barony of Carbury, in the Electoral Division of Cadamstown. Co. Kildare

The Proposed Development will be accessed via the existing entrance point from the L1522.

Johnstown Bridge village is located ca. 1.7km to the east of the site and the village of Kilshanroe is 1.9 km to the south-west. The setting is predominantly rural with surrounding land uses of agriculture, forestry and a number of one-off residential dwellings and one-off commercial type facilities. The site is located approximately 2.5km from Junction 9 on the M4 motorway.

The Proposed Development has a total area, including the access road, of 7.243 hectares (ha) (17.898 acres).

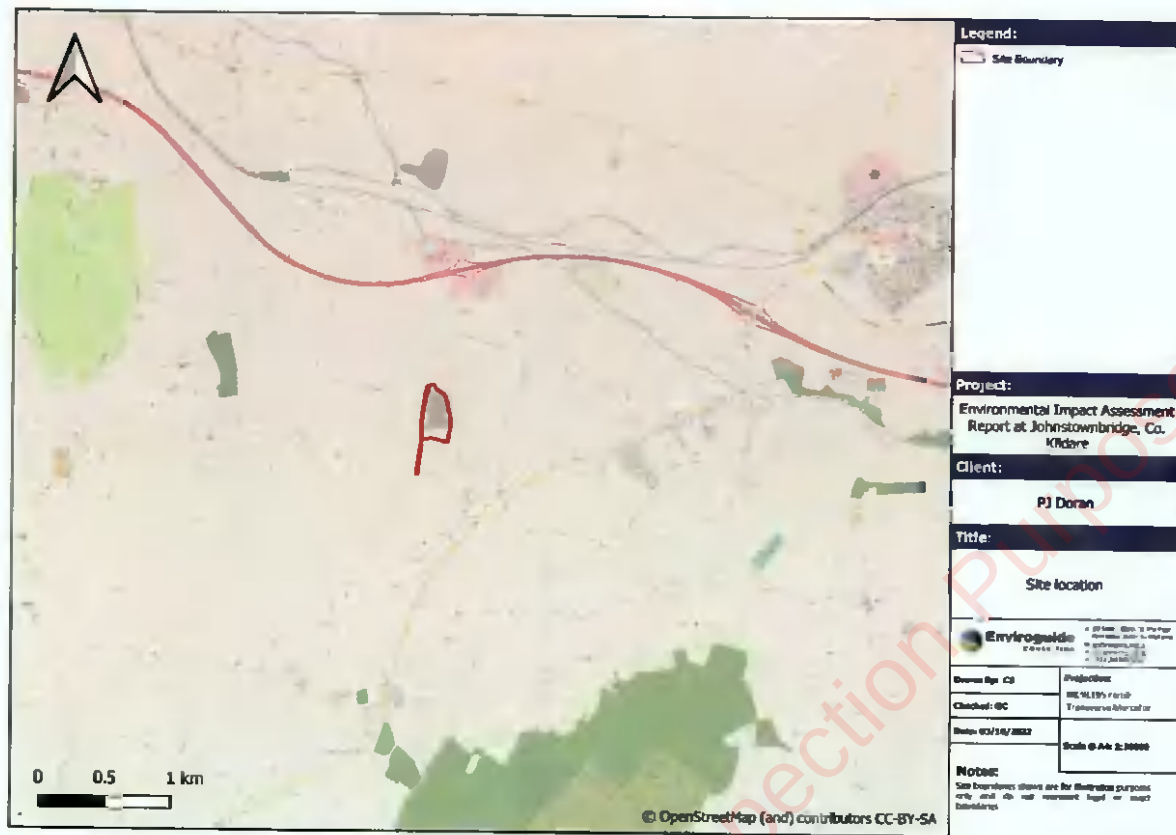


Figure 12-12 Location of the Proposed Development





ADDRESS SD Core C, Block 71 The Plaza, Park West Dublin 12, D12 PF7N	EMAIL info@enviroguide.ie PHONE +353 (0)1 9864730 WEBSITE www.enviroguide.ie	 Copyright and all other intellectual property rights in this drawing are reserved by Enviroguide Consulting. No part of this drawing may be reproduced or transmitted in any form or by any means electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without prior written permission from Enviroguide Consulting.	CLIENT PJ Doran LOCATION Johnstown Bridge, Cloona, Co. Kildare	DRAWING TITLE Proposed Site Layout DEPARTMENT Engineering	DRAWING NO. P 07 SCALE 1:1000 DATE 07/11/2022 STATUS A1
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Figure 12-13 Proposed Site Layout

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12.2.3.2 Land Use History

Historical mapping and aerial photography available from the Ordnance Survey of Ireland website (OSI, 2021) were reviewed and key observations on-site and off-site are summarised in Table 12-14.

Table 12-14 Historical Land Use

Date	Information Source	Site Description
1837-1842	OSI map 6 inch	On-site: The site is shown as a greenfield farmland. Off-site: The site touches a road leading to the main road at the south west corner. The site is bound by greenfield farmland.
1888-1913	OSI map 25 inch	On-site: No significant changes. Off-site: There is no road that connects the site to the main road in the south.
1830-1930	OSI Cassini map 6 inch	On-site: No significant changes. Off-site: No significant changes.
1995	OSI Aerial photography	On-site: There is a visible road on the western boundary of the Site. Off-site: Max Pallets supplier has been developed in the south west. Numerous one-off residential dwellings have been developed in the south and south west.
2000	OSI Aerial photography	On-site: No significant changes. Off-site: There is a building on the south western boundary of the Site. There are more residential dwellings in the south western surrounding areas.
2005	OSI Aerial photography	On-site: Land use change into a Quarry. Off-site: No significant changes.
2013-2018	OSI Aerial photography	On-site: Quarrying activities have ceased Off-site: Development of dwelling approximately 0.23km to the south east of the Site.
2022	Google Maps photography	On-site: There is a pond in the centre of the site and recolonization by vegetation is advanced. Off-site: No significant changes

12.2.3.3 Immediate Surroundings

The area immediately surrounding the Site is characterised by one-off dwellings and farmlands and one-off commercial type facilities. Most of these dwellings occur to the north and west of the site, with mainly agricultural land located to the south and east. 500m southeast of the site, is an industrial facility (Max Pallets), and an infill site which is being redeveloped for agriculture.

12.2.3.4 Local Settlement and Land Use

The Site of the Proposed Development is located in Thomastown, Johnstown Bridge, Co. Kildare.

The Proposed Development will be accessed via the existing entrance point from the L1522.

The R402 Edenderry Road has been realigned and improved in the vicinity of the Proposed Development site and is a high-quality single carriageway with a right turning lane for traffic to

the L5014. The M4 Junction 9 (which is some 2.5 kilometres to the northeast of the site) is accessed via the R402 Edenderry/Enfield Road. The public roadway (L5014 Thomastown/Cadamstown Road) provides access to/from the R402 Edenderry Road.

12.2.3.5 Electricity Supply

12.2.3.5.1 Local Supply & Grid Connection

EirGrid develop and operate the national electricity grid and are responsible for taking electricity from the power generators and delivering it to the distribution network, which is operated by ESB Networks. The high-voltage Irish electricity transmission grid comprises 6,800 km of power lines and operates at 400 kV, 220 kV and 110 kV. Substations provide entry points to, and exits from, the transmission grid. Dunfirth 110 kV Station, lies approximately 3.7km southeast of the site. High-voltage ESB transmission cables traverse the site above ground as can be seen in Drawing P-07 – Proposed Site Layout (Figure 12-12), denoted by orange lines (Enviroguide Consulting, 2022).

12.2.3.5.2 Onsite Supply and Consumption

There is no onsite electricity supply and there is no demand for electricity onsite at present.

12.2.3.6 Gas supply

Gas Networks Ireland builds, develops, and operates Ireland's gas infrastructure, maintaining over 14,521 km of gas pipelines and two sub-sea interconnectors.

There is no onsite gas supply and there is no demand for gas onsite at present.

12.2.3.7 Information and Communications Technology (ICT)

In terms of mobile telecommunication for transmission and reception, the closest mobile/ICT communications mast (Vodafone) is located approximately 2.25km northwest of the site of the Proposed Development. The site currently has no fixed connection to any telecommunications infrastructure. There are no landline telephones or broadband facilities and there is no demand for such infrastructure onsite at present.

12.2.3.8 Water Supply and Demand

The site of the Proposed Development is not connected to a municipal water supply and there is currently no demand for potable water at the site.

12.2.3.9 Local Hydrology and Hydrogeology

The site of the Proposed Development is within the Boyne catchment and Boyne_SC_020 subcatchment. There are no river waterbodies within the site, however a stream recognised as Thomastown Stream (River Waterbody Code IE_EA_07B020200, EPA Code 07T13), a part of the WFD river waterbody of Blackwater (Longwood)_030, runs for a short distance along the northeast boundary of the site, and an onsite drainage ditch discharges into the Thomastown Stream.

The Site is situated on the Trim (IE_EA_G_002) groundwater body. The bedrock aquifer in the area is a Locally Important Aquifer - Bedrock which is Generally Moderately Productive. The groundwater rock units underlying the aquifer are classified as Dinantian Upper Impure Limestones. The level of vulnerability to groundwater contamination from human activities

varies from Moderate across the southern half of the Site, to High across the northern half (GSI, 2022). The majority of the Site contains the subsoil type Limestone sands and gravels (Carboniferous) except a narrow strip of Limestone Till (Carboniferous) at the southern border of the infill area, and the soil is classed as Pastures (EPA, 2022). There are two groundwater monitoring wells installed on the site, one to the east and one to the west. Refer to Figure 12-14 for the locations of the wells.

12.2.3.10 On-site Surface Water Drainage

There is one drainage ditch cut into the site of the Proposed Development which discharges to the stream at the eastern boundary of the site. There are two areas of standing water, one in the northeast and one in the southeast of the site, with a larger waterbody (hereafter referred to as the "pond") in the centre of the site. The surface water bodies are illustrated on Figure 12-14.





Figure 12-14 Locations of Surface Water Bodies and Ground Water monitoring Wells at the Site of the Proposed Development.

12.2.3.11 Wastewater management

The site of the Proposed Development is not connected to a foul water sewer network and there is currently no wastewater produced at the site.

12.2.4 Characteristics of the Proposed Development

The Proposed Development comprises the importation of material to in-fill and re-contour a site which was previously quarried. The Applicant proposes, subject to the grant of permission, to import clean greenfield soil, subsoil and stone to remediate approximately 3.689ha of the total site. The 3.689ha is divided into two distinct areas – Area 1 is 2.718ha and Area 2 is 0.971ha. A fill plan has been drawn up for the importation of 68,970m³ of soil to fill Area 1, and 16,670m³ to fill Area 2, equating to a total of 85,640m³ (ca. 128,460 tonnes) of soil and subsoil. A volume to weight conversion factor of 1.50 is taken from the Waste Management (Landfill Levy) Regulations, 2008, SI 199 of 2008. The surface layer will comprise of 300mm of topsoil

which will be graded to an even surface finish. It is proposed even out the levels of the site in order to allow for the safety of grazing animals. Once the importation is complete the Applicant will seed the land in line with Teagasc guidelines and return it to agricultural use. The proposed new levels and fill plan are detailed in Drawings P-01 to P-07 prepared by Enviroguide Consulting, 2022 (refer to Appendix A).

Once planning permission is obtained, it is intended to apply to Kildare County Council for a Waste Facility Permit. Material will be accepted in accordance with the conditions of the permit. As part of the Environmental Management Plan a register of incoming materials for the site will be maintained at all times. The only List of Waste (LoW) code accepted on site will be 17 05 04 - *Soil and Stones other than those mentioned in 17 05 03*.

It is proposed to accept material onto the site from 08.00 until 18.00 Monday to Friday and 08.00 to 14.00 on Saturday. It is not proposed to operate on Sundays or Bank Holidays.

Temporary welfare facilities will be located in the northeast of the site as per Figure 12-12, Site Layout Plan and harvested rainwater will be used in the wheel wash or for dust suppression.

Soil will be imported using Heavy Goods Vehicles from contractors authorised to transport waste, coming from a known source which has previously been inspected. In the interest of maintaining quality of incoming material the number of contractors delivering material to the site will be limited to a single contractor. Prior to deposition the consignment note for each load will be inspected by the site supervisor to ensure that the material is acceptable, and each load will be evaluated in accordance with the site's waste acceptance procedure.

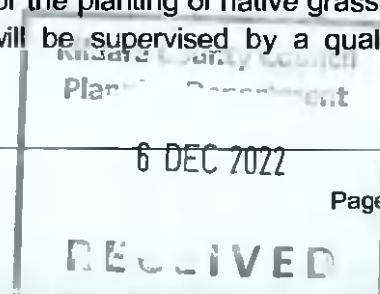
The site has the potential to import inert soil and stones for land improvement for agriculture uses and will also improve drainage. As the site elevations decrease from across the site, with the most acute declines located to the north, it is proposed to raise the northern, central and southern sections of the site to come in line with the boundary elevations, refer to Drawings P-04 and P-05 for elevations. The proposed plant will consist of a tracked bulldozer for placing the soil and compressing it to a level that will permit good drainage. An excavator may be brought on to site from time to time to construct internal haul roads.

Thus, the focus of the proposed filling is concentrated in the central and eastern areas of the site. Cut and fill cross sections for the Proposed Development are attached as part of this planning application (refer to drawings included as Appendix A). Details of existing ground level, proposed change in elevation and final fill level are detailed in Drawings P-01 to P-07. It is proposed to carry this work out over a 5-year period, subject to the availability of appropriate soil, to allow the soil to settle naturally with minimal compaction. The soil and subsoils will be mixed, to minimise compaction and improve drainage.

Filling operations will be confined to a selected area of the site at any one time with each area being restored in a timely manner from commencement of the next phase.

A 10-meter buffer and silt fence will be maintained along the eastern boundaries of the site where no soil importation will take place to protect surface waters and to ensure that there are no offsite nuisances created by the site.

The re-profiling of the surface will be carried out to allow for the planting of native grassland as recommended by Teagasc. The re-profiling works will be supervised by a qualified



landscape architect to ensure that the filling is carried out in a manner that will derive maximum benefit from this.

Details of all proposed plant and equipment associated with the proposed activities are provided in Table 12-15.

Table 12-15 Description of Plant and Equipment associated with Proposed Activities

Plant/Machinery Item	Description
Surface Mounted Weighbridge	A weigh bridge is a machine for weighing vehicles. Weigh bridges weigh vehicles dependably and accurately, and they can be surface mounted with a ramp leading up a short distance and the weighing equipment underneath.
Surface Mounted Wheel Wash	A wheel washing system is a device for cleaning the tires of trucks when they are leaving a site, to control and eliminate the pollution of public roads. The installation can be made in or above the ground for either temporary or permanent applications.
Tracked Bulldozer	A bulldozer is a large, motorized machine that travels on continuous tracks or large tires and is equipped with a metal blade to the front for pushing material: soil, sand, snow, rubble, or rock during construction or conversion work.
Excavator	An excavator is a heavy machine that has various sizes, a hydraulic arm with a blade at the tip, designed to move on wheels or chains and also has the ability to rotate 360 degrees on its own axis. Its functions in a quarry environment are to excavate, rotate, move and load aggregate.

12.2.5 Potential Impact of the Proposed Development

This section assesses the impact of the Proposed Development on Material Assets of the area during the filling phase and the plantation phase of the project operations. The Proposed Development is for the importation of material to in-fill and re-contour the site. There are no significant construction works proposed at the site as there is an existing access gate and internal roadways. The Proposed Development will not involve any excavation of soil and bedrock.

Proposed site activities will predominantly consist of vehicle movements to transport soil and stones onto the site. The proposed plant will consist of a tracked bulldozer for placing the soil and compressing it to a level that will permit good drainage. An excavator may be brought on to site from time to time to construct internal tracks. The Applicant proposes, subject to the grant of permission to import clean greenfield soil and stone to remediate approximately 3.689ha of the total site. Once the importation is complete the Applicant will commence planting the site with native grassland to render it suitable for agriculture.

12.2.5.1 Electricity Supply

12.2.5.1.1 Construction Phase

There is no Construction Phase proposed as part of the current planning application. Additionally, there is no connection to the local electricity supply proposed for the current planning application. All site activities will be mobile and will be powered by diesel. Hence there will be no impacts on local electricity supply as a result of the Construction Phase of the Proposed Development.

12.2.5.1.2 Operational Phase

There is no connection to the local electricity supply proposed for the current planning application. Power for all site activities will be provided by a diesel generator, hence the impacts on the local electricity supply as a result of the Operational Phase of the Proposed Development will be neutral and negligible in the long term.

12.2.5.2 Gas Supply

12.2.5.2.1 Construction Phase

There is no Construction Phase proposed as part of the current planning application and connection to the national gas network is not available in the area, hence there will be no impacts on gas supply as a result of the Construction Phase of the Proposed Development.

12.2.5.2.2 Operational Phase

The project does not rely on gas supply for processing activities onsite and connection to the national gas network is not available in the area, hence the impacts on the local gas supply as a result of the Operational Phase of the Proposed Development will be neutral and negligible in the long term.

12.2.5.3 Information and Communications Technology (ICT)

12.2.5.3.1 Construction Phase

There is no Construction Phase proposed as part of the current planning application and there is no requirement for connection to ICT by the Proposed Development, hence there will be no impacts on ICT as a result of the Construction Phase of the Proposed Development.

12.2.5.3.2 Operational Phase

There is no requirement for connection to ICT by the Proposed Development, hence the impacts on ICT as a result of the Operational Phase of the Proposed Development will be neutral and negligible in the long term.

12.2.5.4 Water Environment – Hydrology and Surface Water Drainage

12.2.5.4.1 Construction Phase

A closed loop wheel wash and temporary welfare facilities will be prefabricated offsite and will be delivered to the site of the Proposed Development prior to the commencement of site activities. Additionally, prior to the acceptance of any material on-site, existing on-site drainage channels will be piped and filled with appropriate material to facilitate efficient drainage.

There will be no storage or handling of deleterious materials such as lubricants, oils etc on site. Spill kits will be provided on-site to deal with any potential spills or leaks that may occur during the delivery of the prefabricated wheel wash and welfare facilities. If the accidental release of deleterious material including fuels from plant/equipment or vehicles on-site (through the failure of secondary containment or a materials handling accident) were to occur over open ground then these materials could infiltrate through the soil contaminating the underlying groundwater and potentially the Thomastown Stream, located along the northeastern boundary of the site. In the event of such a scenario, and in the absence of

mitigation, it is considered that this could result in a negative, moderate and medium-term impact on the receiving water environment depending on the nature of the incident.

12.2.5.4.2 Operational Phase

The land will be restored and planted with native grassland. As the surface cover will be changed from glaciofluvial limestone sands and gravels at ground surface to a lower permeability soil, there may be the potential to reduce infiltration to soil and increase surface runoff. The soil will be infilled in a manner to ensure that there will be adequate drainage through soils and in accordance with relevant EPA restoration guidelines and there will be no increased flood risk. Overall, it is considered that the likely impacts of the Operational Phase of the Proposed Development on hydrology and surface water drainage will be neutral and imperceptible in the long term based.

12.2.5.5 Foul Water

12.2.5.5.1 Construction Phase

There is no Construction Phase proposed as part of the current planning application and there is no requirement for connection to foul water by the Proposed Development, hence there will be no impacts on the local foul water network as a result of the Construction Phase of the Proposed Development.

12.2.5.5.2 Operational Phase

A temporary welfare unit will be in place for the infilling phase, which will be self-contained and emptied by vacuum tanker as required. Hence the likely impacts of the Proposed Development on foul water infrastructure are neutral and imperceptible in the short term. Once the infilling activities are complete the site will be returned to agriculture and will not be connected to a municipal foul water system as part of the Proposed Development, therefore there will be no impact on the local municipal foul water system during the Operational Phase of the Proposed Development.

12.2.5.6 Water supply

12.2.5.6.1 Construction Phase

There is no Construction Phase associated with the Proposed Development, therefore there are no identified potential impacts to local water supply. Bottled water will be provided for drinking water.

12.2.5.6.2 Operational Phase

There will be no impact on the local mains water supply during the Operational Phase of the Proposed Development.

12.2.5.7 Waste Management

12.2.5.7.1 Construction Phase

A small quantity (<1 tonnes per annum) of non-hazardous canteen waste will be generated by the site operations, which will be stored in wheelie bins on site and collected by an appropriately authorised waste collector and will be sent for recycling, recovery, or disposal to

a suitably licensed or permitted waste facility. Wastes generated on site (excluding topsoil) will be collected by an appropriately authorised waste collector and will be sent for recycling, recovery, or disposal to a suitably licensed or permitted waste facility. As the quantity of waste that will be generated will be very small in scale, it is not considered that there will be any impact on waste management in the area. Waste could potentially result from non-routine events, including emergency repairs and accidental fuel spills. In the case of accidental fuel spills or other non-routine events, materials would be stored in a sealed container and collected by a licensed contractor and will be sent for recycling, recovery, or disposal to a suitably licensed or permitted waste facility.

Hence there will be a negligible impact on waste management as a result of the Construction Phase of the Proposed Development.

12.2.5.7.2 Operational Phase

Once planning permission is obtained, it is intended to apply to Kildare County Council for a Waste Facility Permit for the importation of soil and stones for the infill and re-contouring of the site. Materials will be accepted in accordance with the conditions of the WFP. The only EWC (LoW) code accepted on site will be 17 05 04 - *Soil and Stones other than those mentioned in 17 05 03** and a register of all incoming material for the infilling activities will be maintained at all times. However, if contaminated soil and stones were to be brought to site through the failure of Waste Acceptance Procedures which will be implemented as a requirement of the Waste Facility Permit, and in the absence of mitigation, it is considered that this could result in a 'negative', 'moderate to significant' and 'medium term' impact on waste management at the site, depending on the nature of the contamination.

12.2.5.8 Potential Cumulative Impacts

The cumulative effects of Proposed Development on Material Assets have been assessed taking other planned, existing, and permitted developments in the surrounding area into account.

When considered in conjunction with other permitted, planned and existing development in the vicinity of the Site, it is predicted that the cumulative effects the Proposed Development on surface water, foul water disposal, potable water supply, natural gas supply, electrical supply, telecoms, and municipal waste will be negligible.

12.2.5.9 "Do Nothing" Impact

If the Proposed Development is not advanced, the Site would remain as a spent quarry with associated spoil heaps, standing water, and unmanaged piles of mixed wastes. If no waste management is undertaken at the site of the Proposed Development, the surrounding environment would be increasingly affected.

Over time, the area would be recolonised by plants, including the invasive Japanese Knotweed. Without proper site management, this will lead to larger scale problem in the future, requiring increased volumes of mixed waste streams and soil contaminated with invasive species to be treated at an appropriate waste facility.

12.2.6 Avoidance, Remedial & Mitigation Measures

Specific avoidance, remedial and mitigation measures for the protection of groundwater and surface water are detailed in full in Chapter 7 of this EIAR.

Soil and stones will only be accepted in accordance with the conditions of the WFP and an Environmental Management System (EMS) will be implemented and will be designed in conjunction with best environmental practice. The importation of greenfield soil and stone will be subject to control procedures which will include testing for contaminants, invasive species and other anthropogenic inclusions. Contract and procurement procedures will ensure that all fill material imported to the Site are coming from a known source which has previously been inspected at the source location and approved for transport to the Proposed Development site. Any and all materials imported to the Site for recovery will be inspected on delivery to the Site. Quality control procedures will be in place to check and verify all materials recovered at Site are acceptable in accordance with the Waste Facility Permit. Therefore, any unsuitable material will be identified prior to unloading / placement on-site and will be placed in the quarantine area.

12.2.6.1 "Worst Case" Scenario

In a 'Worst Case' scenario, the potential for fill materials imported to the Site for recovery are sourced from unknown sources or materials that are not accepted in accordance with the conditions of the Proposed Developments Waste Facility Permit, may result in the importation of contaminated materials which could subsequently contaminate the receiving water environment. The potential accidental release to the receiving water environment would only occur in the event of a failure of the remedial and mitigation measures. However, if this were to occur there would be a negative impact on the receiving water (hydrological and hydrogeological) environment. In this scenario contaminated materials imported to the Site will then be removed to an appropriately authorised facility. Incoming material will only be accepted at the Site once it has been inspected at the source location and approved for transport use at the Proposed Development Site. All quarantine waste loads will be recorded on the quarantine waste log and details of each of these loads will be maintained at the Site office.

12.2.7 Residual Impacts

Residual Impacts are defined as *'effects that are predicted to remain after all assessments and mitigation measures'*. They are the remaining *'environmental costs'* of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts. Potential residual impacts from the Proposed Development were considered as part of this environmental assessment.

Having regard to the mitigation measures proposed within this and other Chapters of the EIAR, no significant residual impacts are anticipated. The increased vulnerability to the water environment, land and soil will be mitigated with the restoration of the land.

Once planning permission and a Waste Facility Permit are obtained, soil and subsoil from greenfield development sites will be accepted in accordance with the conditions of the permit. As part of the Environmental Management Plan a register of incoming materials for the site will be maintained at all times. The only EWC code accepted on site will be 17 05 04 *Soil and Stones other than those mentioned in 17 05 03**.

The implementation of an Environmental Management System, designed in conjunction with best environmental practice, will ensure that there will be no significant adverse residual impacts on Material Assets associated with the Proposed Development. Once infilling activities have ceased, the restoration of the Site will be to agricultural use, therefore resulting in a positive residual impact.

The Proposed Development provides positive steps towards the fulfilment of the Kildare County Development Plan 2017-2023 as it will facilitate the development of agriculture in rural Ireland and will provide a much-needed outlet for clean greenfield soil during the remediation process – all while supporting the planting of native species. Furthermore, the site will be of increased value and functional use. The operation of the Site is small in nature and does not have the capacity to impact on the wider area.

12.2.8 Monitoring

An EMS will be developed and implemented for the operational lifetime of the Proposed Development. An Environmental Monitoring Programme (EMP) which will be developed as part of the EMS will verify (i) that implemented controls prevent and minimise emissions from the Proposed Development and (ii) that there is no negative impact on the receiving environment via uncontrolled releases of pollutants, sediment, dust, noise or vibration. Monitoring will also assess the effects of the quarrying activities on the environment so that operational changes and improvements can be made where appropriate. The EMP and sampling frequency will be agreed with Kildare County Council.

12.2.9 Interactions

Material assets, utilities and waste interact with other environmental receptors as follows:

- Population and Human Health: The improper removal, handling and storage of waste could negatively impact on the health of workers and local people. Potential impacts on population and human health are addressed in Chapter 4.
- Biodiversity: The improper handling and storage of waste could negatively impact on biodiversity. Potential impacts on biodiversity are addressed in Chapter 5.
- Land and Soil: Improper handling and segregation of hazardous or contaminated wastes could lead to the contamination of soil and stones excavated from the site. Potential impacts on land and soils are addressed in Chapter 6.
- Water (Hydrology & Hydrogeology): Improper handling and segregation of hazardous or contaminated wastes could lead to the contamination of waterbodies. Potential impacts on water are addressed in Chapter 7.
- Traffic: Waste collection and delivery activities at the Proposed Development have the potential to impact upon traffic movements in the Johnstown Bridge area. Potential impacts on traffic are addressed in Chapter 12.1.

12.2.10 Difficulties Encountered When Compiling

No difficulties were encountered in the preparation of this Chapter

12.2.11 References

Environmental Protection Agency (EPA) (2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)

EPA (2003) Advice Notes on Current Practice in the preparation of Environmental Impact Statements.

EPA (2002) Guidelines on the information to be contained in Environmental Impact Statements

EPA Maps Online <https://gis.epa.ie/EPAMaps/> Consulted on 08/06/2022.

<https://siteviewer.comreg.ie/#explore> (ComReg, 2021). Commission for Communications Regulation Mast Viewer. Consulted on 08/09/2022.

Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (European Communities 1999)

<https://myplan.ie/> (DHLGH, 2021) Zoning and National Planning Applications Map Viewer. Consulted on 08/09/2022.

National Townland and Historical Map Viewer (2022)
<https://geohive.maps.arcgis.com/apps/webappviewer/index.html?id=9def898f708b47f19a8d8b7088a100c4> Consulted on 08/09/2022



13 RISK MANAGEMENT

13.1 Study Methodology

13.1.1 Scope and Context

The relevant legislation to which this chapter applies is Statutory Instrument (SI). No. 296/2018 - European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 and in particular Schedule 6 – Information to be contained in EIAR. The following paragraphs of Schedule 6, Paragraph 2(e)(i)(IV), specifically refers "a description of the likely significant effects on the environment of the proposed development resulting from ... the risks to human health, cultural heritage or the environment (for example due to accidents or disasters)."

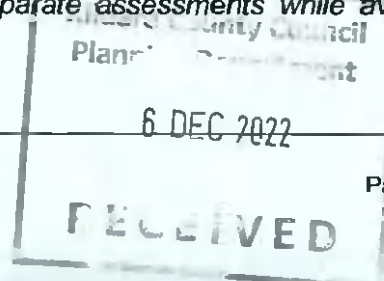
Paragraph 2(h) further expands with "a description of the expected significant adverse effects on the environment of the proposed development deriving from its vulnerability to risks of major accidents and/or disasters which are relevant to it. Relevant information available and obtained through risk assessments pursuant to European Union legislation such as the Seveso III Directive or the Nuclear Safety Directive or relevant assessments carried out pursuant to national legislation may be used for this purpose, provided that the requirements of the Environmental Impact Assessment Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for, and proposed response to, emergencies arising from such events."

This Chapter was prepared by Enviroguide Senior Environmental Consultant Nikita Coulter. Nikita Coulter has a B.Sc. in Zoology (Hons) from University College Dublin, an M.Sc in Biodiversity and Conservation and a Postgraduate Diploma in Environmental Engineering from Trinity College Dublin, and a NEBOSH accredited International Diploma in Environmental Risk Management. Nikita has 8 years professional experience as an Environmental Compliance Specialist.

13.1.2 Guidelines and Reference Material

This assessment, of major accidents and disasters is a relevantly new requirement in legislation and, as a result, national guidelines are not yet available. Cognisance has been taken of the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022).

Specifically, the EPA Guidelines state that the EIAR must take account of "the vulnerability of the project to risk of major accidents and /or disasters relevant to the project concerned and that the EIAR therefore explicitly addresses this issue. The extent to which the effects of major accidents and / or disasters are examined in the EIAR should be guided by an assessment of the likelihood of their occurrence (risk)... The potential for a project to cause risks to human health, cultural heritage or the environment due to its vulnerability to external accidents or disasters is considered where such risks are significant, e.g. the potential effects of floods on sites with sensitive plants. Where such risks are significant then the specific assessment of those risks in the form of a Seveso Assessment (where relevant) or Flood Risk Assessment may be required. The EIAR should refer to those separate assessments while avoiding duplication of their contents."



Reference has also been made to the Office of Emergency Planning, Department of Defence (DOD) Publication 'A National Risk Assessment for Ireland 2020'. A consolidated list of national hazards for Ireland identified in the DOD document are identified in Table 13-1.

Table 13-1: Consolidated List of National Hazards (Source: A National Risk Assessment for Ireland (2020) Department of Defence)

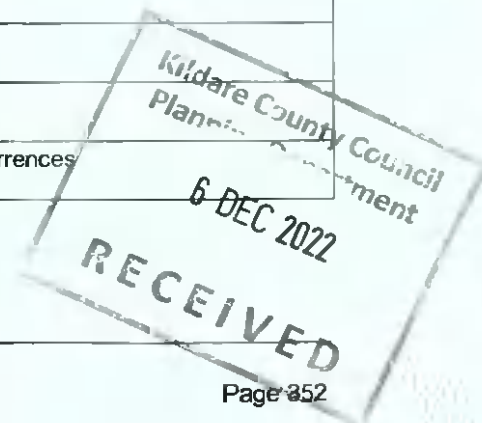
Hazard: Civil • Large Crowd Event • Pandemic • Water Supply Distribution and Contamination • Food Chain Contamination • Animal Disease • Terrorist Incident	Hazard: Natural • Storm • Snow and Ice (Including prolonged low temperature) • Flooding (Including pluvial, fluvial and coastal)
Hazard: Transportation • Maritime Incident • Air Incident • Transport Hub (Includes Airports, Ports and Rail Stations)	Hazard: Technological • Structural Collapse (Including Dam, Tunnel, Bridge and Building) • Nuclear Incident (Abroad) • Cyber Incident • Disruption of Energy Supply (Including oil, gas, electricity and communications)

13.1.3 Risk Assessment Methodology

The risk assessment methodology has been supported by general risk assessment methods. Hazard analysis and risk assessment are accepted internationally as essential steps in the process of identifying the challenges that may have to be addressed by society, particularly in the context of emergency management. Mitigation as a risk treatment process involves reducing or eliminating the likelihood and/or the impact of an identified hazard.

Table 13-2 Classification of National Likelihood Criteria (Source: A National Risk Assessment for Ireland (2020) Department of Defence)

National Likelihood Criteria		
Rating	Classification	Average Recurrence Interval
1	Extremely Unlikely	100 or more years between occurrences
2	Very Unlikely	51-100 year between occurrences
3	Unlikely	11-50 years between occurrences
4	Likely	1-10 years between occurrences
5	Very Likely	Ongoing/Less than 1 year between occurrences



13.2 Predicted Impacts

The EIAR chapters within this report identify that the Proposed Development has been designed in accordance with best practice and that the Proposed Development can be safely undertaken without risk to health.

In order to understand the potential consequences and predicted impacts of any major accident or disaster due to the Proposed Development and the vulnerability of the project a desk study was undertaken. The assessment reviewed:

- The vulnerability of the project to major accidents or disasters.
- The potential for the project to cause risks to human health, cultural heritage and the environment, as a result of that identified vulnerability.

A methodology has been used including the following phases:

Phase 1 Assessment:

The DOD Consolidated List of National Hazards was used to identify a preliminary list of potential major accident and disasters. Receptors covered by legislation were not included within the assessment e.g., construction workers.

Phase 2 Screening:

The list was screened and major events such as volcanoes were not included given the unlikely event of one occurring. Elements already addressed as a key part of the design e.g., risks of building collapse, are not repeated.

Phase 3: Mitigation and Evaluation

In the event that mitigation measures included did not mitigate against the risk, then, the potential impacts on receptors are identified in the relevant chapter. Table 13-3 lists the major accidents and/or disasters reviewed.

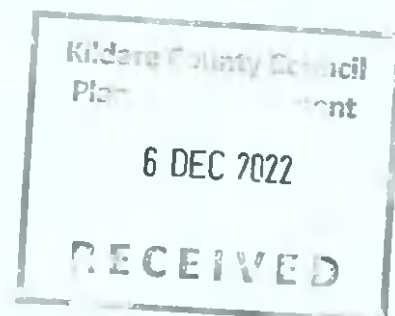
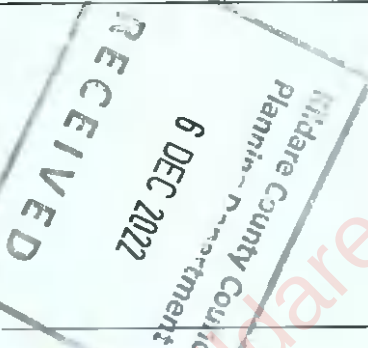


Table 13-3: Major Accidents and/or Disasters Reviewed

Major Accident or Disaster	Relevant for this Proposed Development? (Y/N)	Why relevant?	Potential Receptor	Covered within EIAR?
Civil				
Large Crowd Event (An event with over 5,000 people)	N	Not considered vulnerable due to the nature of the Proposed Development, i.e., the importation of material to infill and re-contour land to result in the improvement of agricultural land.	N/A	N/A
Pandemic	Y	Covid-19 is an illness that can affect your lungs and airways. It is caused by a virus called Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). SARS-CoV-2 is spread in sneeze or cough droplets. The Proposed Development poses no additional Covid-19 risk. It is anticipated that there will be approximately 2 workers directly employed during the construction phase of the project. During the Construction Phase of this Proposed Development HSE guidelines will be adhered to as relevant. All workers directly and indirectly employed during the Operational Phase of the Proposed Development will comply with the relevant Government protocols that will be in place at that point in time in relation to Covid-19.	Local businesses, construction workers	Chapter 4 (Population and Human Health) of this report addresses Covid-19.



Water Contamination	Supply	N	Waterborne diseases can be caused by consuming contaminated drinking water. No public health issues have been identified for the Construction Phase or Operational Phase of the Proposed Development.	Local water users	Chapter 7 (Hydrology) of this report identifies the control measure required to avoid contamination of water supplies.
Food Contamination	Chain	N	Not considered vulnerable as the Site will be restored with geochemically appropriate soil and subsoil from greenfield or equivalent sites as per EPA guidelines (EPA, 2020). Contract and procurement procedures will ensure that all infill materials imported to the Site are coming from known sources which have previously been inspected and will be in accordance with all relevant statutory consents for both the source Sites and the Proposed Development Site.	Consumers/Producers/ Livestock/Biodiversity	Chapter 6 (Land & Soils) of this report identifies the control measure required to avoid contamination of soils, and hence the food chain, during future agricultural use of the land.
Animal Disease		N	Not considered vulnerable as the Site will be restored with geochemically appropriate soil and subsoil from greenfield or equivalent sites as per EPA guidelines (EPA, 2020). Contract and procurement procedures will ensure that all infill materials imported to the Site are coming from known sources which have previously been inspected and will be in accordance with all relevant statutory consents for both the source Sites and the Proposed Development Site.	Consumers/Producers/ Livestock/Biodiversity	Chapter 6 (Land & Soils) of this report identifies the control measure required to avoid contamination of soils, and hence animals, during future agricultural use of the land.
Terrorist Incident		N	Not considered vulnerable due to the nature of the Proposed Development.	N/A	N/A
Transportation					
Maritime Incident		N	Not considered vulnerable as the site is approximately 46.5km from the coast.	N/A	N/A
Air Incident		N	Not considered vulnerable. The closest commercial airport is Dublin Airport which is approximately 42km from the site. Casement Aerodrome or Baldonnell Aerodrome is a military airbase located approximately 30km from the site.	N/A	N/A
Transport Hub (Includes Airports, Ports and Rail Stations)		N	Not considered vulnerable as the Site of the Proposed Development is approximately 3.4km from the closest train station at Enfield, and approximately 46.5km from the closest Port station at Dublin Port.	N/A	N/A

Natural				
Cultural, Archaeological and Architectural Heritage	N	Not considered vulnerable as no known archaeological, architectural or cultural heritage remains were found during the desk top survey.	N/A	Chapter 10 (Archaeology and Cultural Heritage) of this EIAR assessed the impact of the Proposed Development on the Archaeological and Cultural Heritage.
Landslides / Sinkholes	N	Not considered vulnerable. The Proposed Development Site and surrounding lands are located within an area with a 'low' landslide susceptibility classification (GSI, 2022). There are no recorded landslides at the Proposed Development Site recorded on the GSI database (GSI, 2022) The GSI (GSI, 2022) records for karst features indicate that there are no karst features within 2km of the Proposed Development Site.	N/A	Chapter 6 (Land and Soils) of this EIAR assessed the vulnerability of the Proposed Development to ground movements.
Earthquakes	N	Not considered vulnerable. Earthquakes are not likely to occur in the vicinity of the Proposed Development Site at a sufficient intensity to pose a risk for the Proposed Development.	N/A	N/A
Floods/Storm surge/tidal flooding	N	There are no risks associated with flooding at the site.	N/A	Chapter 7 (Hydrology) of this EIAR identifies the vulnerability of the project to flooding.
Severe weather such as Tornados, Heatwaves, Blizzards and Droughts	N	Not considered vulnerable. In the event of severe weather events, the national meteorological service, Met Éireann, provides advance notice of severe weather, usually several days in advance. When appropriate, colour-coded weather warnings are issued. The Office of Emergency Planning works with the government departments and other key public authorities in order to ensure the best possible use of resources and compatibility across different emergency planning requirements.	N/A	N/A
Air Quality events	N	Vehicular emissions	Residents/ workers	Chapter 8 (Air Quality) of this EIAR identifies the impact of the construction

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		Dust emissions		and operation of the development on ambient air quality.
Wildfires	N	Not considered vulnerable due to the location of the site and the nature of the Proposed Development.	N/A	N/A
Fire	N	Due to the nature of proposed operations on-site the risk of fire is considered to be low.	Construction workers / Residents / Employees	Section 13.3.2 of this Chapter deals with Fire Safety and Emergency Response.
Invasive species	Y	The site contains 2 no. stands of the invasive floral species Japanese Knotweed (JK). There is a risk of spreading JK around/outside of the Site of the Proposed Development. The JK will be removed by a specialist JK consultant prior to commencing any infilling activities at the Site. Additionally, a JK Management plan will be submitted to KCC for approval prior to the removal.	Native species / local biodiversity	Chapter 5 (Biodiversity) of this EIAR identifies preventative measures to be taken with regards to invasive species to avoid the introduction of new invasive species to the Proposed Development Site, and the spread of existing invasive species offsite.
Technological				
Structural Collapse (Building)	N	Not relevant to the Proposed Development	N/A	N/A
Dam, Bridge or Tunnel Failure	N	Not considered vulnerable as no dams, bridges or tunnels are proposed as part of the development.	N/A	N/A
Flood defence failure	N	There are no risks associated with flooding at the site.	N/A	Chapter 7 (Hydrology) of this EIAR identifies the vulnerability of the project to flooding.
Nuclear incident	N	Not considered vulnerable. There are no nuclear power stations near the Proposed Development. The closest is Trawsfynydd Nuclear Power Station, which is located approximately 200km east of the Site of the Proposed Development in Wales.	N/A	N/A
Cyber incident	N	Not considered vulnerable due to the nature of the Proposed Development.	N/A	N/A
Disruption to energy supply (oil, gas, electricity)	N	Not considered vulnerable due to the nature of the Proposed Development.	N/A	Chapter 12 (Material Assets) of this EIAR contains information on the energy systems to be utilised during the Construction and Operational Phases of

				the Proposed Development
Utilities failure (communications)	N	Not considered vulnerable due to the nature of the Proposed Development.	N/A	Chapter 12 (Material Assets) of this EIAR contains information on communications systems.
Utilities failure (water supply)	N	Not considered vulnerable due to the nature of the Proposed Development.	N/A	Chapter 7 (Hydrology) and Chapter 12 (Material Assets) of this EIAR contain information on water supply
Utilities failure (wastewater, sewage)	N	Not considered vulnerable due to the nature of the Proposed Development.	N/A	Chapter 7 (Hydrology) and Chapter 12 (Material Assets) of this EIAR contain information on wastewater and sewage removal and treatment
Utilities failure (solid waste)	N	Not considered vulnerable as a Waste Facility Permit will be obtained from Kildare County Council and an Environmental Management System will be put in place	N/A	Chapter 12 (Material Assets) of this EIAR contains information on solid waste removal and treatment
Industrial accidents (defence, energy, oil and gas refinery, food industry, chemical industry, manufacturing, quarrying, mining)	N	Not considered vulnerable. There are no Upper Tier Seveso sites adjacent to the Site of the Proposed Development. The closest is located approximately 5.5 km southeast from the Proposed Development at Irish Industrial Explosives, Clonagh, Enfield, Co Meath, A83 DY62	N/A	N/A

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13.3 Management Plans

13.3.1 Invasive Species

Any waste soil containing parts of particular terrestrial invasive plants, such as Japanese Knotweed and Giant Hogweed, are regarded as "controlled waste". The Applicant is aware that there are legal restrictions on the handling and disposal of controlled wastes. Soil containing parts of invasive species will not be accepted at the Proposed Development. Preventative measures to be taken are identified in the Biodiversity Chapter of this EIAR.

13.3.2 Emergency Response Plans and Safety Files

A fire strategy will be put in place in advance of starting works on site. Due to the nature of proposed operations on-site the risk of fire is considered to be low. However, the strategy must allow for the increase in labour on site and additional machinery and vehicles to and from the facility.

13.4 Residual Impacts

Control measures will put in place for health and safety and environmental management as per conditions of the proposed Waste Facility Permit, planning permission, relevant code of practices and relevant legislation. The residual impacts will be negligible once all control, mitigation and monitoring measures have been implemented.

13.5 Monitoring

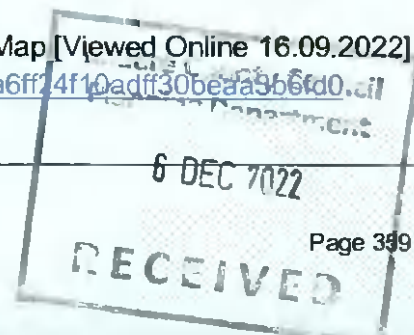
There is no specific monitoring required with regards to risk management. All monitoring proposals for the risks identified in Table 13-3 have been detailed in the relevant technical chapters as listed in Table 13-3 and are included in Chapter 15 Mitigation Measures and Monitoring.

13.6 Conclusion

The design has considered the potential for flooding, road accidents, invasive species or fire within the design methodology. The vulnerability of the Proposed Development to major accidents and/or disasters is not considered significant.

13.7 References

- Chapter 4-12 of Volume 2 of this EIAR
- Environmental Resources Management Ireland Ltd (2005) Public Safety Zones Report
- EPA (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- Garda Mapping Section – Seveso Sites Ireland WebMap [Viewed Online 16.09.2022]
<https://www.arcgis.com/home/item.html?id=a01b5a0a6ff24f10adff30be2a3b6d0.dil>



- Office of Emergency Planning (2020) 'A National Risk Assessment for Ireland 2020'
Department of Defence Publication
- Statutory Instrument (SI). No. 296/2018 - European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018



14 INTERACTIONS

14.1 Introduction

As a requirement of Planning Regulations and the Environmental Protection Agency's 'Guidelines on information to be contained in Environmental Impact Assessment Reports' (2017), interrelationships between various environmental aspects must be considered when assessing the impact of the Proposed Development, as well as individual significant impacts. The significant impacts of the Proposed Development and the proposed mitigation measures have been detailed in the relevant chapters of this report. However, as with all developments that pose potential environmental impacts, there also exists potential for interactions/interrelationships between the impacts of different environmental aspects. The results may exacerbate or ameliorate the magnitude of impacts. This chapter of the EIAR addresses the interactions between the various environmental factors of the Proposed Development.

The following Section is directed by Article 3 section 1(e) of the EIA Directive. The EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (Draft, 2017) and Advice Notes for Preparing Environmental Impact Statements (Draft, September 2015) were also considered.

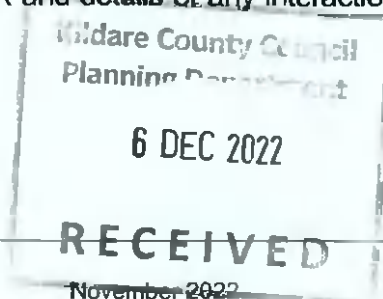
Article 3 of the Directive states:

1. The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:
 - a) population and human health;
 - b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;
 - c) land, soil, water, air and climate;
 - d) material assets, cultural heritage and the landscape;
 - e) the interaction between the factors referred to in points (a) to (d)

14.2 Study Methodology

The interactions between impacts on different environmental factors have been addressed throughout this EIAR. Close co-ordination and management with the EIAR team was carried out to ensure that all likely relevant interactions were addressed at the scoping stage of the EIAR and interactions have been adequately assessed.

Following an assessment of the EIAR, a matrix was produced to display where interactions between impacts on different factors have been addressed. This has been carried out by use of chapter headings included in the EIAR and details of any interaction during all phases of the Proposed Development.



14.3 Interactions

The following matrix has been produced to show where potential significant interactions between effects on different factors have been addressed, see Table 14-1.

As this EIAR has been prepared by a number of specialist consultants, an important aspect of the EIA process was to ensure that interactions between the various disciplines have been taken into consideration. The principal interactions requiring information exchange between the environmental specialists and the design team are summarised in Table 14-2 to Table 14-10.



Table 14-1: Interactions between Factors

Interaction	4. Population and Human Health	5. Biodiversity	6. Land and Soils	7. Hydrology	8. Air Quality & Climate	9. Noise & Vibration	10. Landscape & Visual Amenity	11. Archaeology, Architecture & Cultural Heritage	12. Material Assets – Waste & Utilities	12. Material Assets - Traffic
Population and Human Health										
Biodiversity										
Land and Soils										
Hydrology										
Air Quality and Climate										
Noise & Vibration										
Landscape & Visual Amenity										
Archaeology, Architectural and Cultural Heritage										
Material Assets – Waste & Utilities										
Material Assets - Traffic										
Risk Management										

No Interaction
Interaction
N/A

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Table 14-2 Population and Human Health

Population and Human Health	
Summary	
Chapter 4 of this EIAR, <i>Population and Human Health</i>, details the direct and indirect effects of the Proposed Development on Population and Human Health; and sets out any required mitigation measures where appropriate. The noise impact assessment concluded that any additional noise produced from the site will be negligible and noise monitoring will be carried out throughout the Operational Stage. There is a potential for dust nuisance and reduced air quality. However, mitigation measures will ensure that there is no significant impact.	
Interactions	
Noise and Vibration	During the operational phase, the outward noise impact to the surrounding environment will be limited to any additional traffic on surrounding roads and the operation of on-site machinery. The impact assessment has concluded that additional noise related traffic from the Proposed Development during the operational phase will be unnoticeable and not have a negative impact. Noise monitoring will be carried out to ensure that the facility is operated in accordance with the Waste Facility Permit that will be applied for, for the importation of soils and subsoils and to ensure that offsite noise does not give rise to nuisance to any residents.
Air Quality and Climate	The interaction with air quality during the operational phase has the potential to cause health and dust nuisance issues. The Proposed Development may cause additional dust from operational traffic and infill activities. No significant impacts associated with air quality have been identified. However, mitigation measures will be put in place at the Proposed Development to ensure that the impacts and their effects comply with all ambient air quality legislative limits and therefore the predicted impact is not significant with a neutral effect on human health.
Material Assets: Traffic	There is potential for interaction with Traffic during the operational phase. However, the traffic assessment carried (as detailed in Chapter 12 of this EIAR), concludes that the increase in traffic as a result of the Proposed Development will be insignificant and will not cause any negative impact. There will be no predicted impact on human health.
Landscape and Visual	It is not considered that the Proposed Development by virtue of its visual appearance, will have likely negative effects on the human health of the local population.
Conclusions	

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No significant adverse effects on Noise and Vibration, Air Quality, Traffic or Landscape and Visual is expected to occur as a result of the Proposed Development.

Table 14-3: Biodiversity

Biodiversity	
Summary	
Chapter 5 of this EIAR, <i>Biodiversity</i>, details the direct and indirect effects of the Proposed Development on the local flora and fauna; and sets out any required mitigation measures where appropriate. The Operational Phase of the Proposed Development has the potential to cause adverse impacts for Land and Soil, Hydrology and noise and Vibrations. However, mitigation and monitoring measures have been established in the respective chapters to ensure no significant adverse impact occurs.	
Interactions	
Land and Soil	An assessment of the potential impact of the Proposed Development on the existing land, soils and geological environment; with emphasis on the importation of soil and stone for recovery and the potential accidental release of contaminated materials to ground during both during the Construction and Operational Phases of the Proposed Development, is described in Chapter 6- 'Land, Soil and Geology' of this report. Measures for the mitigation of these impacts are set out in Chapter 6.
Hydrology	An assessment of the potential impact of the Proposed Development on the hydrological and hydrogeological environment is described in Chapter 7- 'Hydrology' of this report. Procedures for dealing with silt laden runoff at the Site; potential spills/leakages of fuels/contaminants; and the best practise construction measures to be in place with regard to waterbodies located at the Site, are outlined in this chapter.
Noise and Vibrations	An assessment of the potential impact of the Proposed Development in the form of excess noise and vibrations associated with the Proposed Works are laid out in Chapter 9- 'Noise and Vibrations'. These impacts are considered to be relevant to the ecological sensitivities associated with the Site of the Proposed Development discussed in this Chapter; and mitigation measures addressing these potential impacts are both referenced in this Chapter and described in full in Chapter 9.
Conclusions	
The Operational Phase of the Proposed Development has the potential to cause adverse impacts for Land and Soil, Hydrology and noise and Vibrations. However, appropriate Mitigation and Monitoring methods have been established to mitigate risk of impacts to Biodiversity and the surrounding environment during both the Construction and Operational Phases of the Proposed	

Development. Hence, no significant adverse effects on Land and Soil, Hydrology or Noise and Vibration is expected to occur as a result of the Proposed Development.



Table 14-4: Land and Soils

Land and Soil	
Summary	
Chapter 6 of this EIAR, <i>Land and Soil</i>, details the direct and indirect effects of the Proposed Development on the local land, soils, and geology; and sets out any required mitigation measures where appropriate. Appropriate industry standard and health and safety legislative requirements will be implemented during the Operational Phase of the Proposed Development. The receiving hydrological environment and biodiversity as well as Human Health will be protected through the required procedures. There is the potential for adverse impacts for Air Quality through the infilling of soils at the Proposed Development Site. This is addressed in Chapter 8. Chapter 12 outlines the Material Assets: Waste and Utilities impacts, mitigation and monitoring measures of the Operational Phase of the Proposed Development, ensuring that the disposal/recovery of anthropogenic material is compliant with all relevant policies and protections.	
Interactions	
Population and Human Health	Appropriate industry standard and health and safety legislative requirements will be implemented during the construction and operational phases of the Proposed Development that will be protective of Site workers. It is noted that specific issues relating to Public Health associated with the Proposed Development are set out in Chapter 4 of this EIAR.
Biodiversity	An assessment of the potential impacts of the Proposed Development on the Biodiversity of the Site, with emphasis on habitats, flora and fauna which may be impacted as a result of the importation of soil and stone to the Site for recovery are included in Chapter 5 of this EIAR. It also provides an assessment of the impacts of the Proposed Development on habitats and species, particularly those protected by national and international legislation or considered to be of particular conservation importance and proposes measures for the mitigation of these impacts.
Air Quality and Climate	The infilling of soils at the Proposed Development Site has the potential to generate nuisance impacts (i.e., dust). An assessment of the potential impact of the Proposed Development on air quality and climate is included in Chapter 8 of this EIAR.
Material Assets: Waste and Utilities	The Proposed Development will include Site clearance and off-Site removal for appropriate and compliant disposal/recovery of anthropogenic material including silage film wrapping, stockpiled C&D materials, bagged bark mulch, timber pallets, general waste materials (e.g., plastics, timber pallets,

	empty oil drums, scrap metal etc.). An assessment of the potential impact of the Proposed Development on the material assets including waste management is included in Chapter 12 of this EIAR.
Hydrology and Hydrogeology	An assessment of the potential impact of the Proposed Development on the hydrological and hydrogeological environment is included in Chapter 7 of this EIAR. Procedures for protection of water courses and the underlying bedrock aquifer are set out in Chapter 7 of this EIAR.
Landscape and Visual	An assessment of the potential impact of the Proposed Development on the landscape and visual environment is included in Chapter 10 of this EIAR. Procedures for restoration of landscape are set out in Chapter 10 of this EIAR.
Conclusions	
The Operational Phase of the Proposed Development has the potential to have adverse impacts on Air Quality, Biodiversity, Hydrology and Population and Human Health through dust and air pollution. However, appropriate Mitigation and Monitoring methods have been established in the respective Chapters. Additionally, Chapter 12 outlines the policies and standards that the Proposed Development must comply with under Waste and Utilities, as well as appropriate Mitigation and Monitoring measures to ensure this.	



Table 14-5: Hydrology and Hydrogeology

Hydrology and Hydrogeology	
Summary	
Chapter 7 of this EIAR, <i>Hydrology and Hydrogeology</i>, provides an assessment of the potential impacts of the Proposed Development on hydrology, water and hydrogeology and sets out any required mitigation measures where appropriate. There is a potential risk of adverse impacts in the form of pollution for Biodiversity and Land, Soil and Geology and Population and Human Health. Additionally, there are potential health and safety risks associated with the Operational Phase of the Proposed Development. Each respective Chapter outlines appropriate industry standard and health and safety standards as well as Mitigation and Monitoring measures will ensure that there are no significant impacts.	
Interactions	
Population and Human Health	Appropriate industry standard and health and safety legislative requirements will be implemented during the construction and operational phases of the Proposed Development that will be protective of Site workers. Monitoring of groundwater will ensure that there are no associated human health issues. However, there are no anticipated impacts to groundwater, surface water and nearby potable water supply sources associated with the Proposed Development. It is noted that specific issues relating to Public Health associated with the Proposed Development are set out in Chapter 4 of this EIAR.
Land, Soil and Geology	An assessment of the potential impact of the Proposed Development on the existing land, soils and geological environment are set out in Chapter 6 Land, Soil and Geology.
Biodiversity	An assessment of the potential impacts of the Proposed Development on the Biodiversity of the Site, with emphasis on habitats, flora and fauna which may be impacted a result of the Proposed Development are included in Chapter 5 of this EIAR. It also provides an assessment of the impacts of the Proposed Development on habitats and species, particularly those protected by national and international legislation or considered to be of particular conservation importance and proposes measures for the mitigation of these impacts.
Conclusions	

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Mitigation and Monitoring measures have been established for the protection of Land, Soil and Geology and Biodiversity the Operational Phases of the Proposed Development.

Population and Human Health is protected by the appropriate industry standard and health and safety legislative requirements will be implemented during the construction phase that will be protective of site workers.

There are no adverse interactions expected for as a result of the Proposed Development.



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Table 14-6: Air Quality and Climate

Air Quality and Climate	
Summary	
Chapter 8 of this EIAR, <i>Air Quality and Climate</i>, provides an assessment of the potential impacts of the Proposed Development on ambient air quality and climate, and sets out appropriate mitigation measures where necessary. The greatest potential effect on air quality during the Operational Phase of the Proposed Development is dust nuisances and potential traffic derived pollutants and air emissions.	
Interactions	
Population and Human Health	Interactions between Air Quality and Population and Human Health have been considered as the Operational Phase has the potential to cause health issues as a result of impacts on air quality from dust nuisances and potential traffic derived pollutants. However, the mitigation measures employed at the Proposed Development will ensure that all impacts are compliant with ambient air quality standards and human health will not be affected.
Land, Soils and Geology	The infilling of soils at the Proposed Development Site has the potential to generate nuisance impacts (i.e., dust). Dust emissions as a result of site operations are not considered to pose a significant impact to air quality in the vicinity of the Proposed Development. However, appropriate mitigation and monitoring measures have been recommended and will be implemented at the site in order to minimise the risk of dust emissions arising during the Proposed Development. Provided such measures are adhered to, it is not considered that significant air quality impacts will occur. Furthermore, the trees and hedgerows which are currently present on the site boundary will further act as a natural buffer for dust deposition for all sensitive receptors.
Material Assets: Traffic	Traffic derived pollutants which may affect Air Quality and Climate are deemed insignificant due to the marginal change in traffic volume and movement associated with the Proposed Development as outlined in Chapter 12, Section 2.1 Traffic.
Conclusions	
Appropriate mitigation measures have been recommended and will be implemented at the Site to minimise the risk of dust emissions arising during the Operational Phase and provided such measures are adhered to, it is not considered that significant air quality impacts will occur.	

Table 14-7: Noise and Vibration

Noise and Vibration	
Summary	
Chapter 9 of this EIAR, <i>Noise and Vibration</i>, provides a description and assessment of the likely impact of the proposed activities from noise, and sets out appropriate mitigation measures where necessary. Intermittent on-site noise and vibration is expected for the Proposed Development; however, this will not cause significant adverse impacts beyond the Site boundary. It is not expected that the Proposed Development will cause a significant increase in traffic volumes and the Noise and Vibration effects of the Proposed Development will not have an adverse impact on biodiversity.	
Interactions	
Population and Human Health	The impact assessment of noise and vibration has concluded that additional noise associated with the operation of on-site machinery will be intermittent and will not create any major negative impacts beyond the site boundary. Mitigation and monitoring measures will be incorporated to further reduce the potential for noise generation from the Proposed Development. It is noted that specific issues relating to Population and Human Health associated with the Proposed Development are set out in Chapter 4 of this EIAR.
Biodiversity	It is not considered that the Noise and Vibration effects of the Proposed Development will have an adverse impact on biodiversity in the local area. While the proposed Construction Phase will result in a temporary increase in noise and vibration, it is considered that this will not cause a significant disturbance to the local fauna including birds due to the existing established urban environment.
Material Assets: Traffic	Both the Construction Phase and the Operational Phase of the Proposed Development are expected to generate a limited number of traffic movements on the local road network as outlined in Chapter 12, Section 12.1 Traffic. The Chapter provides a robust assessment by assuming the worst-case scenario of HGV movements were day and a conservative estimate for visitor trips to the site. The impact of noise from operational traffic will be unnoticeable and will not have a negative impact.
Conclusions	

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Operational Phase noise and vibration impacts have been assessed in relation to traffic and plant equipment and no significant impacts will be experienced.

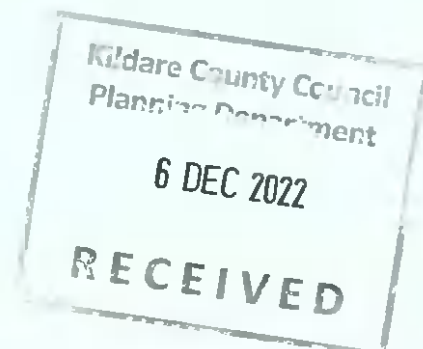


Table 14-8: Landscape and Visual

Landscape and Visual	
Summary	
Chapter 10 of the EIAR, <i>Landscape and Visual Assessment</i>, provides a description and assessment of the likely impact of the Proposed Development on the landscape and visual amenities of the area. The Proposed Development does not have any negative interactions with Population and Human Health or Archaeology and Cultural Heritage. The landscaping of the Site will involve the removal of vegetation, which in turn will affect the ecology of the site.	
Interactions	
Population and Human Health	It is not considered that the Proposed Development by virtue of its visual appearance and in the context of the proposed zoning of the site of the Proposed Development and nature of the surrounding landscape, will cause any issues for the residential local population.
Biodiversity	An assessment of the potential impact of the Proposed Development on the receiving habitats is included in Chapter 5 of this EIAR. The proposed landscape of the site interacts with its biodiversity and ecology through the changes that will occur to the existing habitats and flora at the site. The landscape will entail some losses in terms of vegetation, in specific areas of the site, which in turn will affect the ecology of the site.
Archaeology and Cultural Heritage	As there are no known archaeological or architectural remains found during the desk top survey as well as the walkover survey, it is not predicted that any changes in landscape or visual impact will affect in any way the archaeology of the area.
Conclusions	
The Proposed Development does not have any negative interactions with Population and Human Health and Archaeology and Cultural Heritage, although some vegetation losses are expected which may impact the Biodiversity of the Site.	

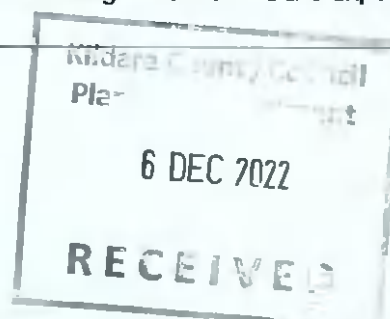


Table 14-9: Archaeology and Cultural Heritage

Archaeology and Cultural Heritage	
Summary	
Chapter 11 of the EIAR, <i>Archaeology and Cultural Heritage</i>, provides information on the known architectural, archaeological and cultural heritage sites in the study area. It is not predicted that any changes in landscape or visual impact will affect in any way the archaeology of the area. Earthworks have the potential to discover previously uncovered archaeological features or deposits, however this is considered unlikely due to extensive previous earthworks on the Site.	
Interactions	
Landscape and Visual	It is not predicted that any changes in landscape or visual amenities will affect in any way the archaeology and cultural heritage of the area. The Site will be infilled with imported inert waste materials to restore the Site to agricultural use.
Land, Soils and Geology	The Proposed Development will involve enabling works including limited excavation and regrading of soil. There is potential for previously unrecorded archaeological features or deposits to be discovered during this process. This is considered extremely unlikely as the land has been previously excavated and no objects or sites of archaeological or cultural importance were identified during the desktop study.
Conclusions	
There are no expected adverse impacts on the Proposed Development.	



Table 14-10: Material Assets - Waste and Utilities

Material Assets - Traffic, Waste and Utilities	
Summary	
Chapter 12 of the EIAR, <i>Material Assets</i>, provides an assessment of the potential impacts of the Proposed Development on Material Assets including traffic, built services and infrastructure. Pollution of soil and/or hydrology/waterways has the potential for negative interactions between Biodiversity, Land, Soil and Geology and Hydrology. The necessary monitoring and mitigation measures for these are discussed in the CEMP as well as the respective Chapters of this EIAR. Waste collection activities at the Proposed Development have the potential to increase traffic flow in the transport infrastructure surrounding the Proposed Development.	
Interactions	
Population and Human Health	The improper removal, handling and storage of waste could negatively impact on the health of workers and local people. Potential impacts on population and human health are addressed in Chapter 4.
Biodiversity	The improper handling and storage of waste could negatively impact on biodiversity. Potential impacts on biodiversity are addressed in Chapter 5.
Land and Soil	Improper handling and segregation of hazardous or contaminated wastes could lead to the contamination of soil and stones excavated from the site. Potential impacts on land and soils are addressed in Chapter 6.
Hydrology and Hydrogeology	Improper handling and segregation of hazardous or contaminated wastes could lead to the contamination of waterbodies. Potential impacts on water are addressed in Chapter 7.
Material Assets: Traffic	Waste collection and delivery activities at the Proposed Development have the potential to impact upon traffic movements in the Johnstown Bridge area. Potential impacts on traffic are addressed in Chapter 12.1.
Conclusions	

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The Proposed Development has the potential to cause adverse effects to Biodiversity, Land, Soil and Geology and Hydrology. Additionally, there is the potential for the Proposed Development to cause adverse effects to Traffic through increased traffic activity.

Table 14-11: Material Assets - Traffic

Material Assets - Traffic, Waste and Utilities	
Summary	
Chapter 12 of the EIAR, <i>Material Assets</i>, provides an assessment of the potential impacts of the Proposed Development on Material Assets including traffic, built services and infrastructure. There is a potential for increased noise and vibration as a result of increased heavy vehicle traffic travelling to and from the Proposed Development.	
Interactions	
Noise and Vibration	The analysis contained within this chapter interacts with the Noise Assessments contained within this EIAR. This is primarily due to the potential for an increase in HV traffic movements on the surrounding road network due to development.
Conclusions	
There will be a marginal short-term increase in heavy vehicle traffic on the adjacent road network due to the operation of the Proposed Development. There will be no long-term residual impacts resulting from the Proposed Development.	

14.4 References

EIAR Chapters 4 to 13 inclusive.



15 MITIGATION AND MONITORING MEASURES

15.1 Introduction

This EIAR has assessed the impacts and resulting effects likely to occur as a result of the Proposed Development on the various aspects of the receiving environment.

The Proposed Development will be operated in a manner that will ensure that the potential impacts on the receiving environment are avoided where possible. In cases where impacts or potential impacts have been identified, mitigation measures have been proposed to reduce the significance of particular impacts. These mitigation recommendations are contained within each chapter exploring specific environmental aspects.

This chapter of the EIAR collates and summarises the mitigation commitments made in Chapter 4 to Chapter 13.

15.2 Summary of Mitigation Measures

15.2.1 Population and Human Health

15.2.1.1 Construction Phase

15.2.1.1.1 Mitigation

There is no Construction Phase associated with the Proposed Development.

15.2.1.1.2 Monitoring

No Construction works are proposed at the development, therefore monitoring measures are proposed for the Construction Phase.

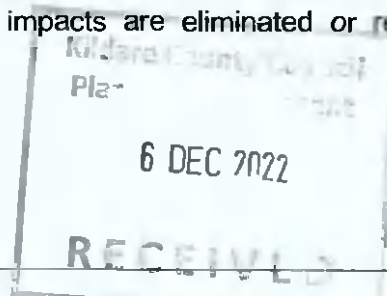
15.2.1.2 Operational Phase

15.2.1.2.1 Mitigation

It is not considered that mitigation measures are required with regard to any of the Proposed Development's impacts on local population or on the local economy. There is no mitigation recommended in relation to land use or tourism as there will not be a significant adverse impact. The Site of the Proposed Development is located on an existing greenfield site and will be solely used for the acceptance of greenfield soil and stone for remediation of the Site itself.

The area surrounding the site is mainly farmland with sparse one-off housing. The operation of the Site is small in nature and does not have the capacity to impact on the wider area. Any impacts on human beings as result of environmental issues such as dust, noise, traffic and visual impacts are addressed in the following sections of the EIAR and include proposals for mitigation where necessary to ensure that such impacts are eliminated or reduced to acceptable levels.

- Chapter 8 – Air Quality
- Chapter 9 – Noise and Vibration
- Chapter 10 – Landscape



- Chapter 12 – Material Assets & Traffic

Compliance monitoring will be undertaken, as per regulatory conditions and annual environmental reports will be compiled to detail the performance of the site once operational. If the site is granted permission these control measures will be maintained to monitor and reduce any impacts in compliance with the Waste Facility Permit for the facility.

15.2.1.2.2 Monitoring

It is recommended that radon testing be carried out in indoor welfare facilities. As per the EPA recommendations;

"If radon levels are above the national workplace Reference Level (300Bq/m³):

- *you will need to carry out remediation work to reduce your levels.*
- *you will then need to re-test the rooms that were above 300 Bq/m³ to confirm that the radon levels have been reduced to below this level.*
- *remediation work and a retest should be carried within 12 months of the original test.*
- *rooms that originally tested above 300 Bq/m³ should be retested every 5 years.*

If your radon results are below 300 Bq/m³ no further action is required unless major refurbishment work is carried out to the building. For example:

- *fitting new windows*
- *building an extension*
- *insulation or any other work that could possibly open up new entry routes for radon or prevent radon escaping from the building"*

No other specific monitoring measures are required in relation to population and settlements, given the lack of direct effects resulting from the Proposed Development. However, where required, monitoring in relation to air emissions, noise and traffic are identified in their respective Chapters in this EIA Report.

The Proposed Development will be subject to a Waste Facility Permit (WFP) from Kildare County Council. The operator will comply with monitoring requirements as per the conditions of the WFP.

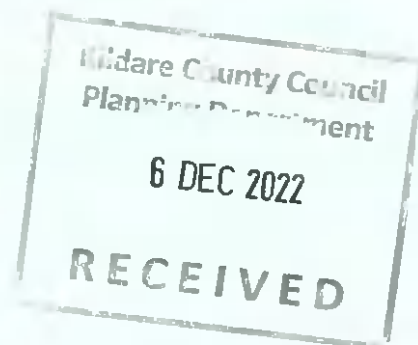
15.2.2 Biodiversity

15.2.2.1 Construction Phase

15.2.2.1.1 Mitigation

15.2.2.2 Protection of Surface water

Surface water discharges from the Site will not be permitted onto the Thomastown Stream nor into the drainage ditches along the eastern and northern boundary or the Site.



In addition, the following measures will be undertaken:

- Run-off from the infilling site or any areas of exposed soil will be channelled and intercepted at regular intervals for discharge to silt-traps or lagoons with over-flows directed to land rather than to surface water features.
- A regular review of weather forecasts of heavy rainfall will be conducted, and a contingency plan will be prepared for before and after such events to minimise any potential nuisances. As the risk of the break-out of silt laden run-off is higher during these weather conditions, no infilling activity will be carried out during such periods where possible.
- Any imported materials will, as much as possible, be placed on Site in their proposed location and double handling will be avoided. Where this is not possible designated temporary material storage areas will be used.
- These temporary storage areas will be surrounded with silt fencing to filter out any suspended solids from surface water arising from these materials.
- All containment and treatment facilities will be regularly inspected and maintained.
- Refuelling of plant during the infilling activities will only be carried out at designated refuelling station locations on site. Each station will be fully equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed before the commencement of works on site.
- Only emergency breakdown maintenance will be carried out on site. Drip trays and spill kits will be available on site to ensure that any spills from vehicles are contained and removed off site.
- All personnel working on site will be trained in pollution incident control response.
- There will be no storage or handling of deleterious materials such as lubricants, oils etc. at the Site
- All associated waste from portaloos and Site facilities will be removed from the Site by a licenced waste disposal contractor.
- Under no circumstances will any untreated wastewater generated onsite (from equipment washing etc.) be released into nearby ditches or the Thomastown Stream.

The ponds at the Site destined for infilling are fed by groundwater (for details please see Chapter 6 – Hydrology). Measures set out to protect surface water above regarding storage and usage of hazardous substances (e.g. fuels) on site will also serve to protect soil and groundwater. Additionally, the infilling of the open waterbodies will include the following additional mitigation measures:

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- In advance of restoration works, the open waterbodies should be infilled to a depth of up to 0.5m with clean round gravel to act as a filter medium for silt removal;
- The infilling of the open water bodies will be undertaken in advance of restoration works across remaining areas of the Site;
- All works will be executed so as to minimise the suspension of solids;
- Any machines working in the vicinity of the open waterbodies will be protected against leakage or spillage of fuels, oils, greases and hydraulic fluids;

Any displaced water during the infilling of the open waterbodies will be allowed to infiltrate to ground in the immediate surrounding area. Where required, drainage runoff controls such as settlement tanks, silt fences and silt traps will be temporarily provided. Displaced water will not be permitted to enter the Thomastown Stream.

Furthermore, where a pollution incident is detected, infilling works will be stopped until the source of the pollution has been identified and remedied.

15.2.2.4 Dust Minimisation Plan

The objective of dust control at the site is to ensure that no significant nuisance occurs at nearby sensitive receptors, including the scrub and freshwater habitats at the Site. To avoid high levels of dust deposits on these habitats arising from the infilling activities at the Site, the following measures will be strictly adhered to:

- Where practicable, movements of large volumes of material will not be carried out in periods of dry and windy weather unless suitable mitigation measures are implemented;
- In the event of prolonged dry weather, rotary atomisers and water bowsers will be employed to dampen material and avoid dust suspension;
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind and shorten the length of time for which material will be stockpiled;
- Cover stockpiles to prevent wind whipping;
- Harvested rainwater will be used as a wheel wash for dust suppression to ensure dust is not transferred to external roads;

Additionally, regular inspections of the infill area buffer zone and boundary habitats will be carried out to monitor dust, and records and notes on these inspections should be logged.

15.2.2.5 Reduction of Noise Impacts

Short-term increases in disturbance levels as a direct result of human activity and through increased generation of noise during the infilling activities can have a range of impacts depending upon the sensitivity of the ecological receptor, the nature and duration of the disturbance and its timing.

Noise generated during the Operational Phase (i.e., infilling activity) of the Proposed Development could cause temporary disturbance to a number of faunal species in the vicinity

of the Site of the Proposed Development. To mitigate this disturbance, the following measures will be implemented:

- Selection of plant with low inherent potential for generating noise.
- Siting of plant as far away from sensitive receptors as permitted by site constraints.
- Avoidance of unnecessary revving of engines and switch off plant items when not required.
- Keep plant machinery and vehicles adequately maintained and serviced.
- Proper balancing of plant items with rotating parts.
- Keep internal routes well maintained and avoid steep gradients.
- Monitoring typical levels of noise during critical periods and at sensitive locations (e.g., during bird breeding season and next to scrub habitats).

These measures will ensure that any noise disturbance to nesting birds or any other fauna species in the vicinity of the Site of the Proposed Development will be reduced to a minimum.

15.2.2.6 Protection of Retained Habitats

The infill plan excludes all of the existing scrub and woodland areas and provides for a buffer zone between the infill areas and the retained habitats. No operation of HGVs or infill plant will be allowed within this buffer zone. This will serve to protect the Root Zone of any retained trees and hedgerow species.

15.2.2.7 Biosecurity

15.2.2.8 Pre-Construction Japanese Knotweed Removal

An extensive Japanese Knotweed (JK) stand was recorded within the southern area of the Site, with an additional small stand just south of the access road inside the main Site area, and another outside of the Site boundary at the access gate from the main road. This species is listed in Part 1 of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011, as amended). No other invasive species listed on Schedule III of the above-mentioned regulations were found at the Site.

The JK found within the Site boundaries will be removed by a specialist JK consultant prior to commencing any infilling activities at the Site. Additionally, a JK Management plan will be submitted to KCC for approval prior to the removal.

15.2.2.9 Operational Phase Invasive Species Management

The following will be adhered to, to avoid the introduction of new invasive species to the Proposed Development Site, and the spread of existing invasive species offsite:

- Any material required on the site will be sourced from a stock that has been screened for the presence of any invasive species by a suitably qualified ecologist and where it is confirmed that none are present.
- All machinery (incl. HGVs bringing infill materials) will be thoroughly cleaned and disinfected prior to arrival on Site to prevent the introduction of new invasive species to the Site.

- Sufficient buffer zones will be maintained around the remaining invasive species stands (i.e., Buddleia), and all plant and HGV operation at the Site will take place outside of these buffer zones.
- All machinery (incl. HGVs bringing infill materials) will be thoroughly cleaned and disinfected before leaving the Site to prevent the spread of invasive species offsite.

15.2.2.10 Protection of Non-volant Mammals

The measures detailed in the preceding sections to reduce noise and dust impacts will also serve to minimise disturbance from same on the terrestrial non-volant mammals (e.g. Badger, Fox, Pine Marten, Hedgehog) utilising the Site. Additionally, the higher sward grassland areas could potentially support day-nesting hedgehogs during the summer. Therefore, higher sward grass areas will be inspected for any sleeping hedgehogs prior to infilling to avoid injury/death. Infilling should also take place in a consistent direction to prevent entrapment of protected fauna potentially present.

To reduce the potential for injury/mortality of commuting mammals, a speed limit of 10km/h along the access road will be implemented and strictly adhered to by all Site traffic (HGVs and staff entering and leaving the Site).

As best-practice, all construction-related rubbish on site e.g., plastic sheeting, netting etc. will be kept in a designated area on site and kept off ground level so as to protect Hedgehogs and any other small mammals occurring on Site from entrapment and death.

15.2.2.11 Protection of Bats and Bat habitats

The measures detailed in the preceding sections to reduce noise and dust impacts will also serve to minimise disturbance from same on any locally occurring bats. Additionally, the Proposed Development could lead to indirect effects on bats by removal of their foraging and commuting habitats (i.e., wet grassland, ponds). No mitigation is required to address potential injury/death of bats arising from the Proposed Development, as no tree removal is proposed.

15.2.2.12 Protection of Birds

The measures detailed in the preceding sections to reduce noise and dust impacts will also serve to minimise disturbance from same on local bird populations.

Any clearance of vegetation (incl. wet grassland) or pond infilling will be carried out outside the main breeding season, i.e. 1st March to 31st August, in compliance with the Wildlife Act 2000. Should any vegetation removal be required during this period, the NPWS will be consulted, and instruction taken from them. Should nesting birds be discovered, the nest will be protected until any nesting birds have fledged and departed the site.

15.2.2.13 Protection of Fish & Amphibians

Prior to the commencement of infilling activities, a dedicated amphibian survey will be undertaken to ascertain presence/absence of Smooth Newt at the Site. The NPWS will be consulted regarding the confirmed frog breeding at the Site, and a derogation licence will be obtained prior to commencement of infilling activities. The NPWS advice on the approach for

infilling the ponds and confirmed breeding areas with regard to protected species (i.e., Common Frog and potential Smooth Newt) will be fully adhered to.

No mitigation or compensation measures were identified to address the impacts from loss of habitat on fish and other aquatic fauna within the ponds destined for infill.

The mitigation measures outlined in section 5.6.1 and 5.6.2 above will serve to protect fish and other aquatic fauna (incl. aquatic lifeforms of invertebrates) in the retained ponds and waterlogged areas of the Site and within the adjacent Thomastown Stream.

15.2.2.14 Timing of vegetation clearance

The following table provides guidance for when vegetation clearance and infilling works of the ponds are permissible. Information sources include the British Hedgehog Preservation Society's *Hedgehogs and Development* and *The Wildlife (Amendment) Act, 2000*.

Table 15-1: Seasonal restrictions on vegetation removal. Red boxes indicate periods when clearance/works are not permissible.

Ecological Feature	January	February	March	April	May	June	July	August	September	October	November	December
Breeding Birds	Vegetation clearance permissible		<u>Nesting bird season</u> No clearance of vegetation or works to relevant structures permitted unless confirmed to be devoid of nesting birds by an ecologist*						Vegetation clearance permissible			
Hibernating mammals (namely Hedgehog, excluding bats)	<u>Mammal hibernation season</u> No clearance of vegetation or works to relevant structures permitted unless confirmed to be devoid of hibernating mammals by an ecologist*		Vegetation clearance permissible							<u>Mammal hibernation season</u> No clearance of vegetation or works to relevant structures permitted unless confirmed to be devoid of hibernating mammals by an ecologist*		

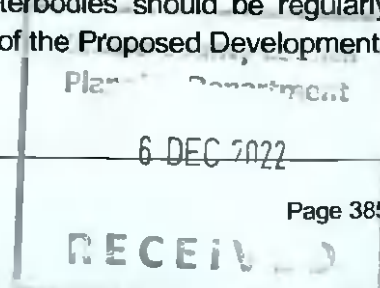
The preferred period for vegetation clearance is within the months of September and October (Table 5-12). Vegetation will be removed in sections working in a consistent direction to prevent entrapment of protected fauna potentially present (e.g. Hedgehog).

15.2.2.14.1 Monitoring

15.2.2.15 Maintenance of Silt Fence and 10m buffer from watercourses

For the duration of the infilling activities at the Proposed Development Site, it is proposed to regularly assess the integrity of the silt fencing installed along the watercourses to the north and east of the Site, to ensure their continued efficacy, with repairs carried out as necessary.

The adherence to the 10m exclusion zone along these waterbodies should be regularly inspected to ensure compliance is continuous for the duration of the Proposed Development.



15.2.2.16 Maintenance of Invasive Species buffer zones and exclusion fencing

For the duration of the infilling activities at the Proposed Development Site, it is proposed to regularly assess the integrity of the fencing installed at the entrance gate, and surrounding any retained invasive species at the Site (e.g., Buddleia), to ensure their continued efficacy, with repairs carried out as necessary.

The adherence to the 10m exclusion zone along the existing invasive species stands should be regularly inspected to ensure compliance is continuous for the duration of the Proposed Development.

15.2.2.17 Amphibians

Monitoring of continued amphibian breeding at the Site is recommended to ensure that the infilling activities do not cause significant impacts to local breeding populations of protected species (i.e., Common Frog and potential Smooth Newt). Continued monitoring approach will take into account the outcomes of consultation with the NPWS (section 5.6.10).

15.2.2.18 Operational Phase

15.2.2.18.1 Mitigation

No mitigation measures are proposed during the Operational Phase of the Proposed Development.

15.2.2.18.2 Monitoring

No monitoring measures are proposed during the Operational Phase of the Proposed Development.



15.2.3 Land and Soils

15.2.3.1 Construction Phase

15.2.3.1.1 Mitigation

There are no significant construction works proposed at the Site with limited excavation and regrading of soil required. The Site office and welfare facilities, and the weighbridge and wheel washing facilities will be prefabricated and delivered to Site.

There will be no storage or handling of deleterious materials such as lubricants, oils etc. and any refuelling will be controlled to minimise the potential for release to ground.

Refuelling of plant and vehicles during the Construction Phase will only be permitted at the designated impermeable refuelling station onsite and will be from a road tanker brought to Site as required. The refuelling station will be fully contained and equipped for spill response. A procedure will be drawn in advance of works commencing which will be adhered to during refuelling of on-Site vehicles. This will include the following:

- Fuel will be delivered to plant on-Site by dedicated tanker;
- All deliveries to on-Site vehicles will be supervised and records will be kept of delivery dates and volumes;
- The driver will be issued with, and will carry at all times, absorbent sheets and granules to collect any spillages that may accidentally occur;
- Where the nozzle of a fuel pump cannot be placed into the tank of a machine then a funnel will be used; and
- All re-fuelling will take place in a designated appropriate bunded area. In addition, spill-kits and oil absorbent materials will be kept on-site in close proximity to the refuelling area.

Emergency procedures will be developed by the appointed Contractor in advance of works commencing and spillage kits will be available on-Site including in vehicles operating on-Site. Construction staff will be familiar with emergency procedures for in the event of accidental fuel spillages. Remedial action will be immediately implemented to address any potential impacts in accordance with industry standards and legislative requirements.

The welfare facilities, that will include a self-contained chemical toilet will be emptied by an approved contractor as part of a maintenance contract and in accordance with relevant waste management legislation

These measures will ensure that there is minimal risk to land, soils and geology associated with the Construction Phase of the Proposed Development.

15.2.3.1.2 Monitoring

The Proposed Development will be subject to a WFP from KCC. The operator will comply with monitoring requirements as per the conditions of the WFP.

Monitoring of imported soil and stone for restoration materials will be undertaken in accordance with the waste acceptance criteria and procedures set out in the WFP to ensure

that only clean inert materials free of contaminants, invasive species and other anthropogenic inclusions is infilled at the Site.

In the event that any soil must be stockpiled before infilling, the stockpiles will be monitored for stability and to ensure there are no emissions such as dust or runoff.

15.2.3.2 Operational Phase

15.2.3.2.1 Mitigation

The Proposed Development will be subject to a WFP from KCC. The operator will comply with the environmental control and mitigation requirements as per the conditions of the WFP. At a minimum the following measures will be put in place to mitigate any potential impact on the receiving land, soils and geology environment.

An Environmental Management System (EMS) will be developed for the Proposed Development and control and mitigation requirements will be strictly implemented for the duration of the Operational Phase to mitigate any potential impact on the receiving hydrological and hydrogeological environment. As part of the EMS a register of incoming materials for the Site will be maintained at all times.

Where topsoil and subsoils are segregated and retained on Site, this material will be carefully managed and maintained in order to minimise potential impact on soil quality handling of the stripped soils will be minimised in stockpiles will not be disturbed once formed. Stockpiles will be formed to minimise infiltration or accumulations of rainwater in the stockpiles.

Subject to grant of permission, only geochemically appropriate soil and subsoil from greenfield development sites or equivalent will be accepted in accordance with the conditions of the permit. Only soils that are identified as geochemically appropriate for Domain 2 as defined in the EPA guidelines (EPA, 2020) will be imported and used for the restoration of the Proposed Development Site.

Quality control procedures will be in place to check and verify all materials imported for restoration at Site are acceptable. The importation of greenfield or equivalent as per EPA guidelines (EPA, 2020) soil and stone will be subject to control procedures which will include testing for contaminants, invasive species and other anthropogenic inclusions. Contract and procurement procedures will ensure that all fill material imported to the Site are coming from a known source which has previously been inspected at the source location and approved for transport to the subject Site. Any and all materials imported to the Site for recovery will be inspected on delivery and prior to unloading / placement on the Site. Any unsuitable materials will be removed from the Site in accordance with all legislative requirements.

The re-profiling of the surface will be carried out to allow for the planting of native grassland as recommended by Teagasc. The re-profiling works will be supervised by a qualified landscape architect to ensure that the filling is carried out in a manner that will derive maximum benefit from this.

There will be no storage or handling of deleterious materials such as lubricants, oils etc. and any refuelling will be controlled to minimise the potential for release to ground.

Refuelling of plant and vehicles during the Construction Phase will only be permitted at the designated impermeable refuelling station onsite and will be from a road tanker brought to Site

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as required. The refuelling station will be fully contained and equipped for spill response. A procedure will be drawn in advance of works commencing which will be adhered to during refuelling of on-Site vehicles. This will include the following:

- Fuel will be delivered to plant onsite by dedicated tanker;
- All deliveries to on-Site vehicles will be supervised and records will be kept of delivery dates and volumes;
- The driver will be issued with, and will carry at all times, absorbent sheets and granules to collect any spillages that may accidentally occur;
- Where the nozzle of a fuel pump cannot be placed into the tank of a machine then a funnel will be used; and
- All re-fuelling will take place in a designated impermeable area. In addition, oil absorbent materials will be kept on-Site in close proximity to the re-fuelling area.

Emergency procedures developed in accordance the EMS will be strictly implemented during the Operational Phase of the Proposed Development and spillage kits will be available on-Site including in vehicles operating on-Site. All staff will be familiar with emergency procedures for in the event of accidental fuel spillages

In the event of a leak or spill from equipment (e.g., leak or spill from machinery during restoration works), any contaminated soil will be removed from the Site and compliantly disposed off-Site. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and EPA guidelines.

The normal measures required to prevent airborne dust emissions and associated nuisance arising from extraction activities will be in place including measures to prevent excessing wind pick up of dust and mud being spread onto the local road network and adjoining properties. This will require additional wetting at the point of dust release, dampening down during dry weather and wheel cleaning for any vehicles leaving the Site. Potential impacts and avoidance and mitigation measures associated with generation of dust are addressed in Chapter 8.

15.2.3.2.2 Monitoring

No monitoring measures are proposed during the Operational Phase of the Proposed Development.



15.2.4 Hydrology

15.2.4.1 Construction Phase

15.2.4.1.1 Mitigation

There are no significant construction works proposed at the Site with limited excavation and regrading of soil required. The site office and welfare facilities, and the weighbridge and wheel washing facilities will be prefabricated and delivered to Site.

There will be no storage or handling of deleterious materials such as lubricants, oils etc. and any refuelling will be controlled to minimise the potential for release to ground.

Refuelling of plant and vehicles during the Construction Phase will only be permitted at the designated impermeable refuelling station onsite and will be from a road tanker brought to site as required. The refuelling station will be fully contained and equipped for spill response. A procedure will be drawn in advance of works commencing which will be adhered to during refuelling of on-site vehicles. This will include the following:

- Fuel will be delivered to plant on-site by dedicated tanker;
- All deliveries to on-site vehicles will be supervised and records will be kept of delivery dates and volumes;
- The driver will be issued with, and will carry at all times, absorbent sheets and granules to collect any spillages that may accidentally occur;
- Where the nozzle of a fuel pump cannot be placed into the tank of a machine then a funnel will be used; and
- All re-fuelling will take place in a designated impermeable area. In addition, oil absorbent materials will be kept on-site in close proximity to the re-fuelling area.

Emergency procedures will be developed by the appointed Contractor in advance of works commencing and spillage kits will be available on-site including in vehicles operating on-site. Construction staff will be familiar with emergency procedures for in the event of accidental fuel spillages. Remedial action will be immediately implemented to address any potential impacts in accordance with industry standards and legislative requirements.

The welfare facilities, that will include a self-contained chemical toilet will be emptied by an approved contractor as part of a maintenance contract and in accordance with relevant waste management legislation.

15.2.4.1.2 Monitoring

There are no monitoring requirements specifically in relation to hydrology and hydrogeology during the Construction Phase of the Proposed Development.

15.2.4.2 Operational Phase

15.2.4.2.1 Mitigation

Once planning is obtained, it is intended to apply to KCC for a waste facility permit. Subject to grant of permission, only clean soil and subsoil from greenfield development sites will be

accepted in accordance with the conditions of the permit. The only EWC code accepted on site will be 17 05 04 - Soil and Stones other than those mentioned in 17 05 03*.

An Environmental Management System (EMS) will be developed for the Proposed Development and control and mitigation requirements will be strictly implemented for the duration of the Operational Phase to mitigate any potential impact on the receiving hydrological and hydrogeological environment. As part of the EMS a register of incoming materials for the site will be maintained at all times.

Mitigation measures will be adopted as part of the construction works on the Proposed Development site. These measures are considered to be best practice construction techniques that are applicable to most developments of this scale and nature. The measures will address the main activities of potential impact which include:

- Control and Management of Water and Surface Runoff;
- Management and control of imported soil and aggregates from off-site sources;
- Fuel and Chemical handling, transport, and storage; and
- Accidental release of contaminants – notify relevant statutory authorities.

As part of the overall construction methodology, sediment and water pollution control risks arising from construction-related surface water discharges will be considered. All works carried out as part of these infrastructure works will comply with all Statutory Legislation including the Local Government (Water Pollution) acts, 1977 and 1990 and the contractor will cooperate fully with the Environment Section of Kildare County Council in this regard.

Import of Soil and Stone

Quality control procedures will be in place to check and verify all materials imported for to the Site are acceptable. The importation of greenfield or equivalent as per EPA guidelines (EPA, 2020) soil and stone will be subject to control procedures which will include testing for contaminants, invasive species and other anthropogenic inclusions. Contract and procurement procedures will ensure that all fill material imported to the Site are coming from a known source which has previously been inspected at the source location and approved for transport to the subject Site. Any and all materials imported to the Site for recovery will be inspected on delivery and prior to unloading / placement on the Site. Any unsuitable materials will be removed from the Site in accordance with all legislative requirements.

Management and Protection of Water

The management and storage of greenfield soil and stone imported to the Site will be carried out in accordance with the pollution prevention controls/ mitigation measures in the EMS that will be developed for the Operational Phase of the Proposed Development.

Imported soils will be sealed to prevent run-off of rainwater /or the generation of dust.

Discharges to the Thomastown Stream will not be permitted. A 10-meter buffer and silt fence will be maintained along the eastern boundaries of the Site where no soil importation will take place to protect surface waters and to ensure that there are no offsite nuisances created by the Site.

An earth bund and silt fence will be constructed around the perimeter of the infill area. The earth bund and silt fencing will act as temporary sediment control devices to protect receiving

watercourses from sediment and potential surface water run-off from the Site. The fencing will be inspected twice daily based on Site and weather conditions for any signs of contamination or excessive silt deposits and records of these checks will be maintained.

All trucks leaving the site will pass through a wheel wash and therefore removing the potential for transport of sediment off-site. The wheel wash will be periodically cleaned out and its contents will be disposed of in the appropriate manner by a suitably licensed waste contractor and never discharged onsite.

The welfare facilities, that will include a self-contained chemical toilet will be emptied by an approved contractor as part of a maintenance contract and in accordance with relevant waste management legislation.

Infilling of Open Waterbodies

The infilling of the existing open waterbodies onsite will be undertaken with cognisance to Construction Industry Research and Information Association (CIRIA), 2006. 'Control of Water Pollution from Linear Construction Projects: Technical guidance' (CIRIA C649) and 'Control of water pollution from construction sites. Guidance for consultants and contractors (C532)' and the following mitigation measures will be strictly adhered to:

- In advance of restoration works, the open waterbodies should be infilled to a depth of 1m with clean native gravel to act as a filter medium prior to infilling with soil and stone;
- The infilling of the open water bodies will be undertaken in advance of restoration works across remaining areas of the Site;
- All works will be executed so as to minimise the re-suspension of solids;
- Any machines working in the vicinity of the open waterbodies will be protected against leakage or spillage of fuels, oils, greases and hydraulic fuels;
- Any displaced water during the infilling of the open waterbodies will be allowed to infiltrate to ground in the immediate surrounding area. Where required, drainage runoff controls such as settlement tanks, silt fences and silt traps will be temporarily provided. Displaced water will not be permitted to enter the Thomastown Stream.

Restoration

The restoration of the Site will take into consideration the surround landscape, the local groundwater flow regime and proposed use of the lands for agriculture (i.e., grazing of animals) and will be undertaken in accordance with the requirements of applicable EPA restoration guidelines (EPA Landfill Design Manuals, 1999 and 2000). Where required, the appropriate drainage layers will be incorporated into the soil cover to minimise potential issues for slope stability associated with pore water.

Accordingly, any potential impact on receiving surface water and groundwater beneath the Proposed Development Site will be avoided taking account of the design and mitigation proposals. Therefore, it is considered that the water quality protection criteria and objectives of the GDSDS and Water Framework Directive will be achieved.

There is no other requirement for mitigation measures for the Operational Phase of the Proposed Development.

Handling of Fuels and hazardous Materials

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There will be no storage or handling of deleterious materials such as lubricants, oils etc. and any refuelling will be controlled to minimise the potential for release to ground.

Refuelling of plant and vehicles during the Construction Phase will only be permitted at the designated impermeable refuelling station onsite and will be from a road tanker brought to site as required. The refuelling station will be fully contained and equipped for spill response. A procedure will be drawn in advance of works commencing which will be adhered to during refuelling of on-site vehicles. This will include the following:

- Fuel will be delivered to plant on-site by dedicated tanker;
- All deliveries to on-site vehicles will be supervised and records will be kept of delivery dates and volumes;
- The driver will be issued with, and will carry at all times, absorbent sheets and granules to collect any spillages that may accidentally occur;
- Where the nozzle of a fuel pump cannot be placed into the tank of a machine then a funnel will be used; and
- All re-fuelling will take place in a designated impermeable area. In addition, oil absorbent materials will be kept on-site in close proximity to the re-fuelling area.

Emergency procedures developed in accordance the EMS will be strictly implemented during the Operational Phase of the Proposed Development and spillage kits will be available on-site including in vehicles operating on-site. All staff will be familiar with emergency procedures for in the event of accidental fuel spillages

In the event of a leak or spill from equipment (e.g., leak or spill from machinery during restoration works), any contaminated soil will be removed from the Site and compliantly disposed off-site. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and EPA guidelines.

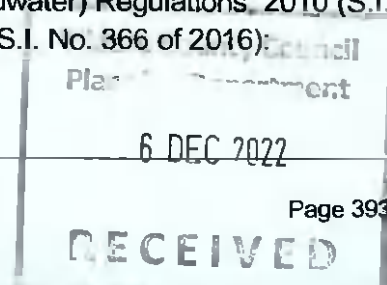
15.2.4.2.2 Monitoring

The Proposed Development will be subject to a waste facility permit from KCC. The operator will comply with monitoring requirements as per the conditions of the waste facility permit.

Monitoring of imported soil and stone for restoration materials will be undertaken in accordance with the waste acceptance criteria and procedures set out in the waste facility permit to ensure that only clean inert materials free of contaminants, invasive species and other anthropogenic inclusions is infilled at the site to ensure that there are no potential contaminant sources at Site.

A monitoring programme for groundwater monitoring will be implemented for the Proposed Development. The groundwater quality monitoring programme will ensure that the implemented mitigation and restoration measures are effective in controlling emissions and that there is no negative impact on the receiving water (hydrogeological) environment.

Groundwater samples will be analysed for the following parameters to ensure compliance with the European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010), as amended 2012 (SI 149 of 2012) and 2016 (S.I. No. 366 of 2016):



- pH, electrical conductivity, temperature, dissolved oxygen, ammoniacal nitrogen, total petroleum hydrocarbons (TPH), heavy metals.

It is proposed that groundwater monitoring is undertaken annually. However, the monitoring programme and sampling frequency will be agreed with KCC.



15.2.5 Air Quality

15.2.5.1 Construction Phase

15.2.5.1.1 Mitigation

There are no mitigation requirements specifically in relation to Air Quality and Climate during the Construction Phase of the Proposed Development.

15.2.5.1.2 Monitoring

There are no monitoring requirements specifically in relation to Air Quality and Climate during the Construction Phase of the Proposed Development.

15.2.5.2 Operational Phase

15.2.5.2.1 Mitigation

Air Quality

Dust emissions as a result of site operations are not considered to pose a significant impact to air quality in the vicinity of the Proposed Development. However, to minimise the risks of such impacts occurring, a series of mitigation measures have been prepared:

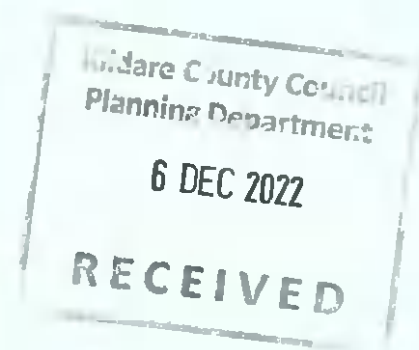
- Where practicable, movements of large volumes of material will not be carried out in periods of dry and windy weather unless suitable mitigation measures are implemented;
- In the event of prolonged dry weather, rotary atomisers and water bowsers will be employed to dampen material and avoid dust suspension;
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind and shorten the length of time for which material will be stockpiled;
- Harvested rainwater will be used as a wheel wash for dust suppression to ensure dust is not transferred to external roads;
- Operational activities are located away from dust sensitive land uses and will be carried out over 100m from local sensitive receptors.
- Exhaust emissions from construction vehicles and machinery will be minimised by avoidance of engines running unnecessarily as idle engines will not be permitted for excessive periods

Climate

As negative climatic impacts associated with the development are negligible, no mitigation measures are proposed.

15.2.5.2.2 Monitoring

The Proposed Development will be subject to a Waste Facility Permit (WFP) from Kildare County Council. The operator will comply with monitoring requirements as per the conditions of the WFP. Quarterly operational dust monitoring will be put in place to ensure dust mitigation measures are effective in controlling emissions. This will be conducted using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119.



15.2.6 Noise & Vibrations

15.2.6.1 Construction Phase

15.2.6.1.1 Mitigation

There are no mitigation requirements specifically in relation to Noise and Vibrations during the Construction Phase of the Proposed Development.

15.2.6.1.2 Monitoring

There are no monitoring requirements specifically in relation to Noise and Vibrations during the Construction Phase of the Proposed Development.

15.2.6.2 Operational Phase

15.2.6.2.1 Mitigation

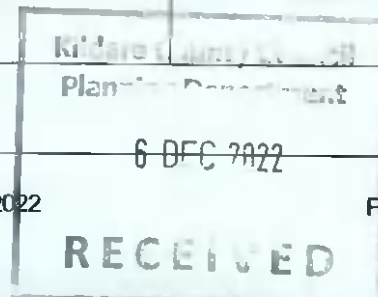
In order to control likely noise impacts caused by the proposed operations, mitigation measures as set out in *BS 5228-1: A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise* can be adopted;

- Selection of plant with low inherent potential for generating noise.
- Siting of plant as far away from sensitive receptors as permitted by site constraints.
- Avoid unnecessary revving of engines and switch off plant items when not required.
- Keep plant machinery and vehicles adequately maintained and serviced.
- Proper balancing of plant items with rotating parts.
- Keep internal routes well maintained and avoid steep gradients.
- Minimise drop heights for materials or ensure a resilient material underlies.
- Use of alternative reversing alarm systems on plant machinery.
- Where noise becomes a source of resonating body panels and cover plates, additional stiffening ribs or materials should be safely applied where appropriate.
- Limiting the hours during which site activities likely to create high levels of noise are permitted
- Appointing a site representative responsible for matters relating to noise
- Monitoring typical levels of noise during critical periods and at sensitive locations

15.2.6.2.2 Monitoring

The Proposed Development will be subject to a Waste Facility Permit (WFP) from Kildare County Council. The operator will comply with the noise monitoring requirements as per the conditions of the WFP. Based on the quiet area screening as detailed in Section 0 of this Chapter, the following noise limits will be complied with:

Scenario	Daytime Noise Criterion, dB LAr,T (07:00 to 19:00hrs)	Evening Noise Criterion, dB LAr,T (19:00 to 23:00hrs)	Night-time Noise Criterion, dB LAeq,T (23:00 to 07:00hrs)
Proposed Noise Limits for the Proposed Development	55dB	50dB	45dB



15.2.7 Landscape & Visual

15.2.7.1 Construction Phase

15.2.7.1.1 Mitigation

As the landscape and visual impacts of the Proposed Development will not cause any significant long-term negative impacts on the surrounding landscape or visual amenities, it is not foreseen that any avoidance, remedial or mitigation measures will be required for the Proposed Development.

15.2.7.1.2 Monitoring

No specific monitoring measures were considered in the Construction Phase.

15.2.7.2 Operational Phase

15.2.7.2.1 Mitigation

The most essential measure to maintain this visual neutrality, in the long term, is the maintenance of the tree/shrub hedge that surrounds the property, which may require some cleaning and maintenance actions.

15.2.7.2.2 Monitoring

Specific monitoring requirements will be that which comply with the proposed Waste Facility Permit, subject to grant of the planning application by Kildare County Council.

The re-profiling works will be supervised by a qualified landscape architect to ensure that the filling is carried out in a manner that will derive maximum benefit from this.

As already referred the monitoring and maintenance of the hedgerows of the Proposed Development is essential. Any works within close proximity to retained trees are advised to be undertaken in accordance with approved method statements prepared by the construction contractor under the direct supervision of a qualified consultant Arboriculturist. Therefore, during the operational phase, a professionally qualified Arboriculturist is recommended to be retained by the principal contractor or site manager to monitor and advice on any works within the RPA of retained trees to ensure successful tree retention and planning compliance. The Arboriculturist is to make regular site visits to ensure that the tree protection measures are in place and adhered to.



15.2.8 Archaeology and Cultural Heritage

15.2.8.1 Construction Phase

15.2.8.1.1 Mitigation

There will be no construction or sub-surface works associated with the project.

15.2.8.1.2 Monitoring

No specific monitoring measures are required in relation to archaeology and cultural heritage for the Proposed Development (see 11.6 above) as there are no sub-surface works associated with the development plans. Therefore, the only specific monitoring requirements will be that which comply with the proposed Waste Facility Permit, subject to grant of the planning application by Kildare County Council.

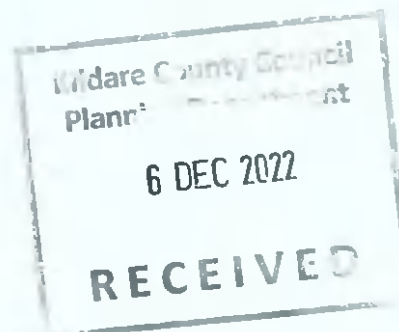
15.2.8.2 Operational Phase

15.2.8.2.1 Mitigation

Since no known archaeological, architectural or cultural heritage remains were found during the desk top survey as well as the walkover survey, it is likely that there are no further mitigation measures required for this development, however if any archaeological remains are discovered during this project, all works will cease and an expert archaeologist will be brought to Site and all future works will be carried out under the supervision of the archaeologist.

15.2.8.2.2 Monitoring

No specific monitoring measures are required in relation to archaeology and cultural heritage for the Proposed Development (see 11.6 above) as there are no sub-surface works associated with the development plans. Therefore, the only specific monitoring requirements will be that which comply with the proposed Waste Facility Permit, subject to grant of the planning application by Kildare County Council.



15.2.9 Materials Assets

15.2.9.1 Construction Phase

15.2.9.1.1 Mitigation

15.2.9.1.2 Monitoring

15.2.9.2 Operational Phase

15.2.9.2.1 Mitigation

Specific avoidance, remedial and mitigation measures for the protection of groundwater and surface water are detailed in full in Chapter 7 of this EIAR.

Soil and stones will only be accepted in accordance with the conditions of the WFP and an Environmental Management System (EMS) will be implemented and will be designed in conjunction with best environmental practice. The importation of greenfield soil and stone will be subject to control procedures which will include testing for contaminants, invasive species and other anthropogenic inclusions. Contract and procurement procedures will ensure that all fill material imported to the Site are coming from a known source which has previously been inspected at the source location and approved for transport to the subject Site. Any and all materials imported to the Site for recovery will be inspected on delivery to the Site. Quality control procedures will be in place to check and verify all materials recovered at Site are acceptable in accordance with the Waste Facility Permit. Therefore, any unsuitable material will be identified prior to unloading / placement on-site and will be placed in the quarantine area.

15.2.9.2.2 Monitoring

An EMS will be developed and implemented for the operational lifetime of the Proposed Development. An Environmental Monitoring Programme (EMP) which will be developed as part of the EMS will verify (i) that implemented controls prevent and minimise emissions from the Proposed Development and (ii) that there is no negative impact on the receiving environment via uncontrolled releases of pollutants, sediment, dust, noise or vibration. Monitoring will also assess the effects of the quarrying activities on the environment so that operational changes and improvements can be made where appropriate. The EMP and sampling frequency will be agreed with Kildare County Council.



15.2.10 Traffic

15.2.10.1 Construction Phase

15.2.10.1.1 Mitigation

As part of the construction phase, a number of mitigation measures are proposed. These are as follows;

- In order to minimise the potential impact on the local road network surfaces, a wheel-wash facility will be provided during the construction phase to mitigate against material such as dust, earth, debris etc. from entering the local road network.
- Staff vehicles within the bounds of the subject site, in which there is ample room for parking of vehicles, in order to mitigate against the overspill of parking to the local road network.
- Haul routes outlined within 12.1.5.2.4 will be strictly adhered to by construction vehicles.

15.2.10.1.2 Monitoring

As outlined above, construction works required to enable site operations are minimal. Given the short temporary nature of the construction phases, the characteristics of the local road network, the impact of the estimated construction traffic is expected to be minimal. However, the local road network in the vicinity of the site will be monitored during the construction and operational phases, with regular observations of the local road network. Should monitoring indicate any excess mud or debris on the road, a road sweeper can be organised (if required) to clean the surface.

15.2.10.2 Operational Phase

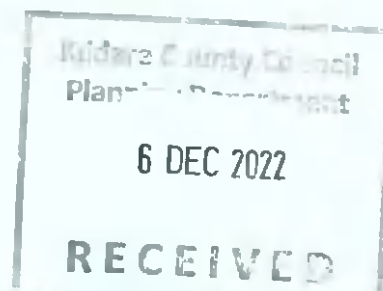
15.2.10.2.1 Mitigation

As part of the operational phase, several mitigation measures are proposed, which are as follows;

- In order to minimise the potential impact on the local road network surfaces, a wheel-wash facility will be provided during operational phase to mitigate against material such as dust, earth, debris etc. from entering the local road network.
- Haul routes outlined within 12.1.5.2.4 will be strictly adhered to by site vehicles.
- The required sightlines of 160 metres are achievable in both directions to ensure adequate visibility of drivers egressing the site of oncoming traffic.

15.2.10.2.2 Monitoring

There are no monitoring measures proposed for the operational phase.





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Appendix A





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Appendix A

Kildare Coounty Council - Inspection Purposes Only

Planning Pack Map

Coill Mhór na
mBreatnach
Kilmorebrannagh

Area of Lands
Owned in Blue
32.769ac / 13.267ha

Baile Thomáis
Thomastown

Site outlined in Red
17.898ac / 7.243ha

Baile Sheáin
Johnstown

Cill
Mhuire
Kilmurry

LOCATION OF
SITE NOTICE

0 50 100 150 200 metres
0 150 300 450 600 Feet

OUTPUT SCALE: 1:2,500



CENTRE
COORDINATES:
ITM 674390,739663

ORDER NO.:
50266322_1

PUBLISHED:
05/05/2022

MAP SERIES:
1:2,500
1:2,500

MAP SHEETS:
3121-B
3121-D

CAPTURE RESOLUTION:
The map objects are only accurate to the resolution at which they were captured. Output scale is not indicative of data capture scale. Further information is available at: <http://www.osi.ie>; search 'Capture Resolution'

LEGEND:
<http://www.osi.ie>; search 'Large Scale Legend'

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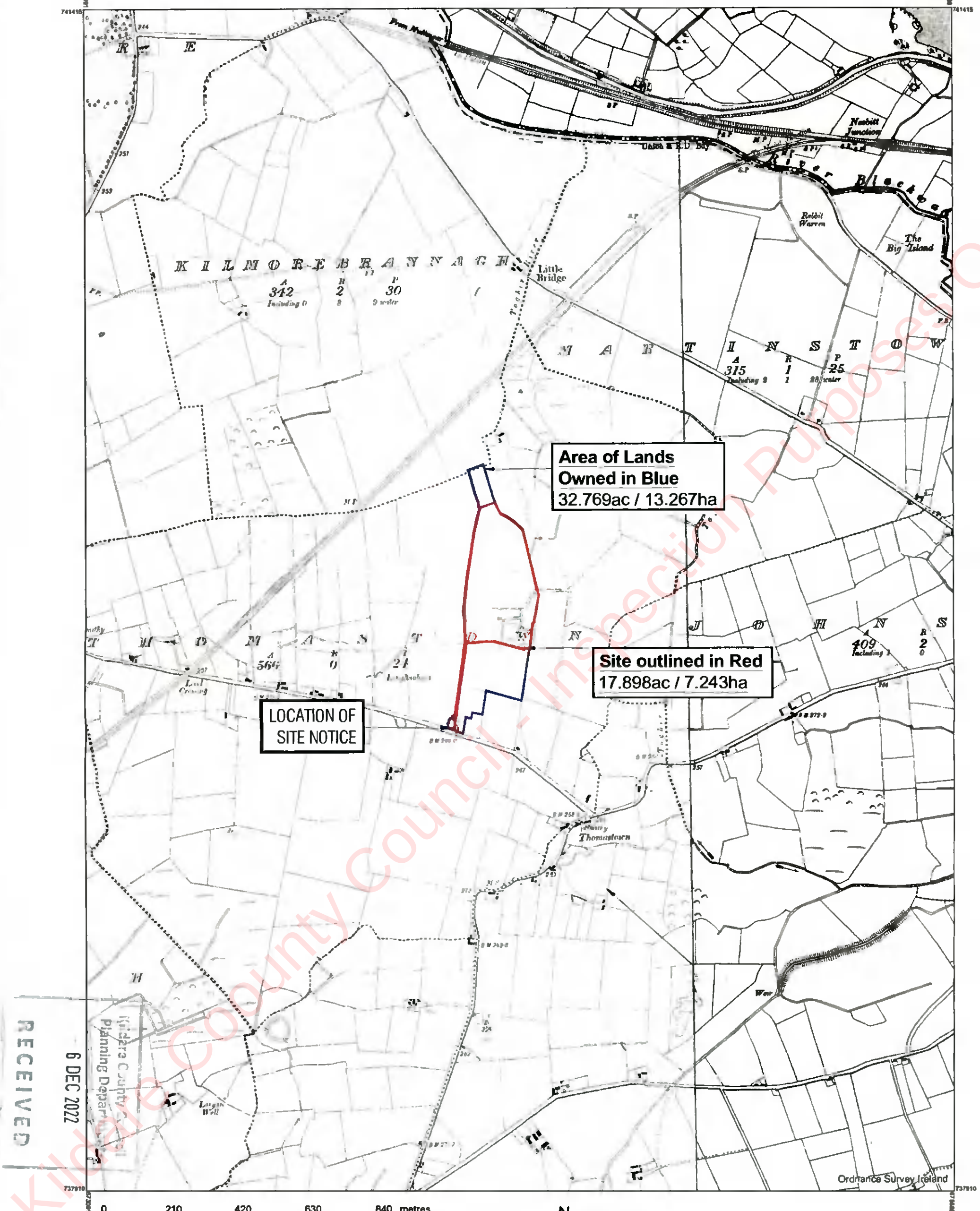
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Kildare County Council
Planning Department
6 DEC 2022

Site Location Map



**Area of Lands
Owned in Blue**
32.769ac / 13.267ha

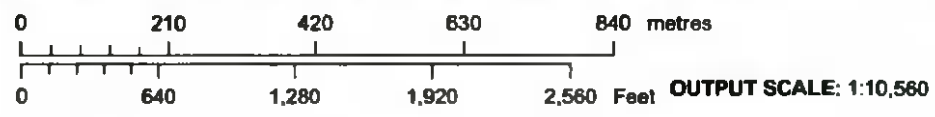
Site outlined in Red
17.898ac / 7.243ha

**LOCATION OF
SITE NOTICE**

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Kildare County Council
Planning Department



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**CENTRE
COORDINATES:**
ITM 674390,739663

ORDER NO.:
50266322_1

MAP SERIES:
6 Inch Raster
6 Inch Raster
6 Inch Raster
6 Inch Raster

PUBLISHED:
05/05/2022

MAP SHEETS:
KE003
KE004
MH047
MH048+048A

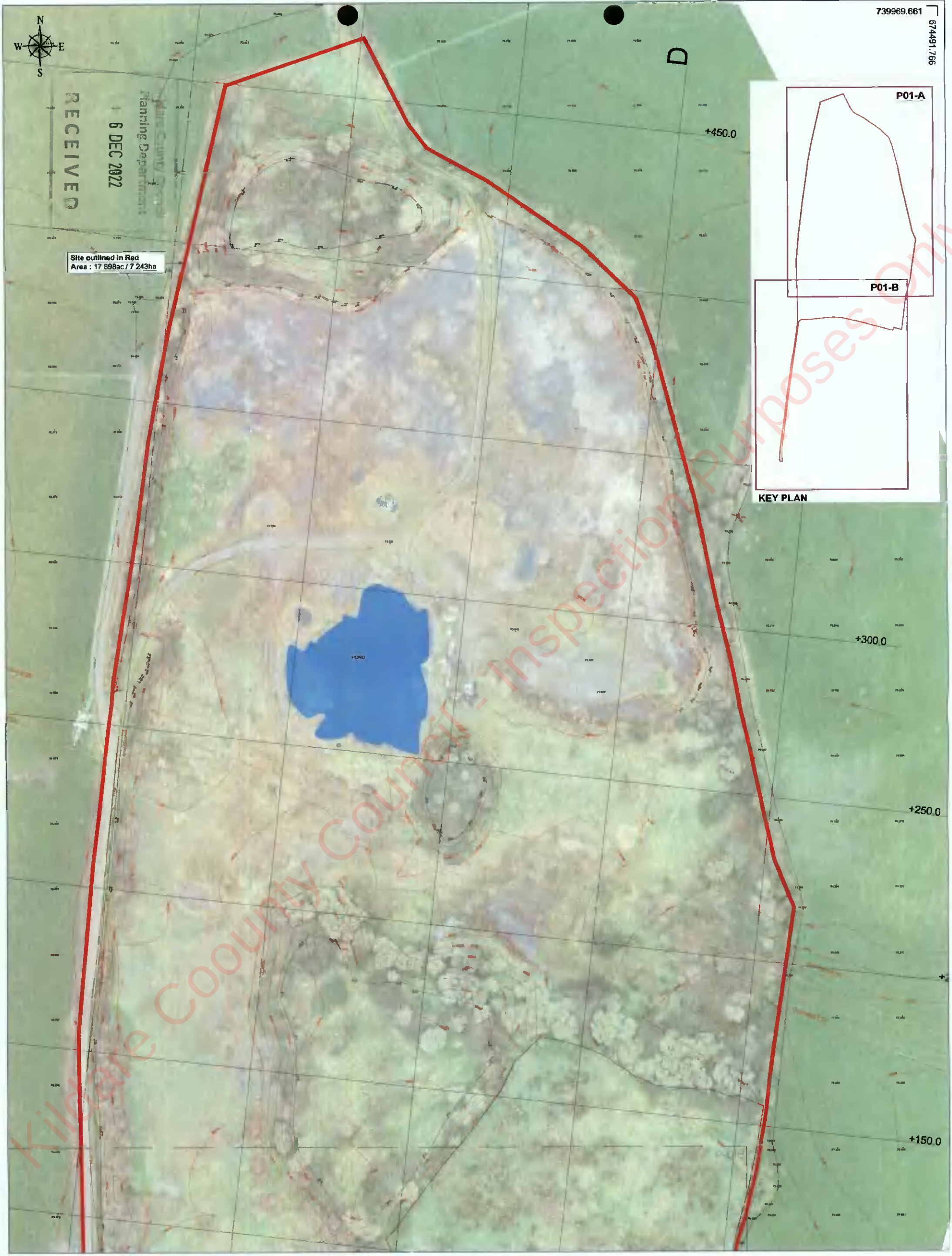
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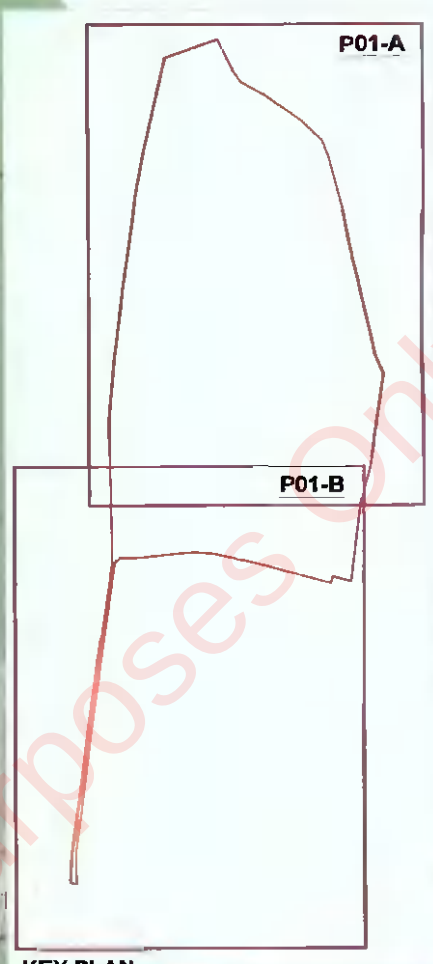


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6 DEC 2022

Site outlined in Red
Area : 17 898ac / 7 243ha

739969.661
674491.766



KEY PLAN

Enviroguide
CONSULTING
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3D Corp C, Block 7,
The Plaza, Park West,
Dublin 12, D12 F8T4

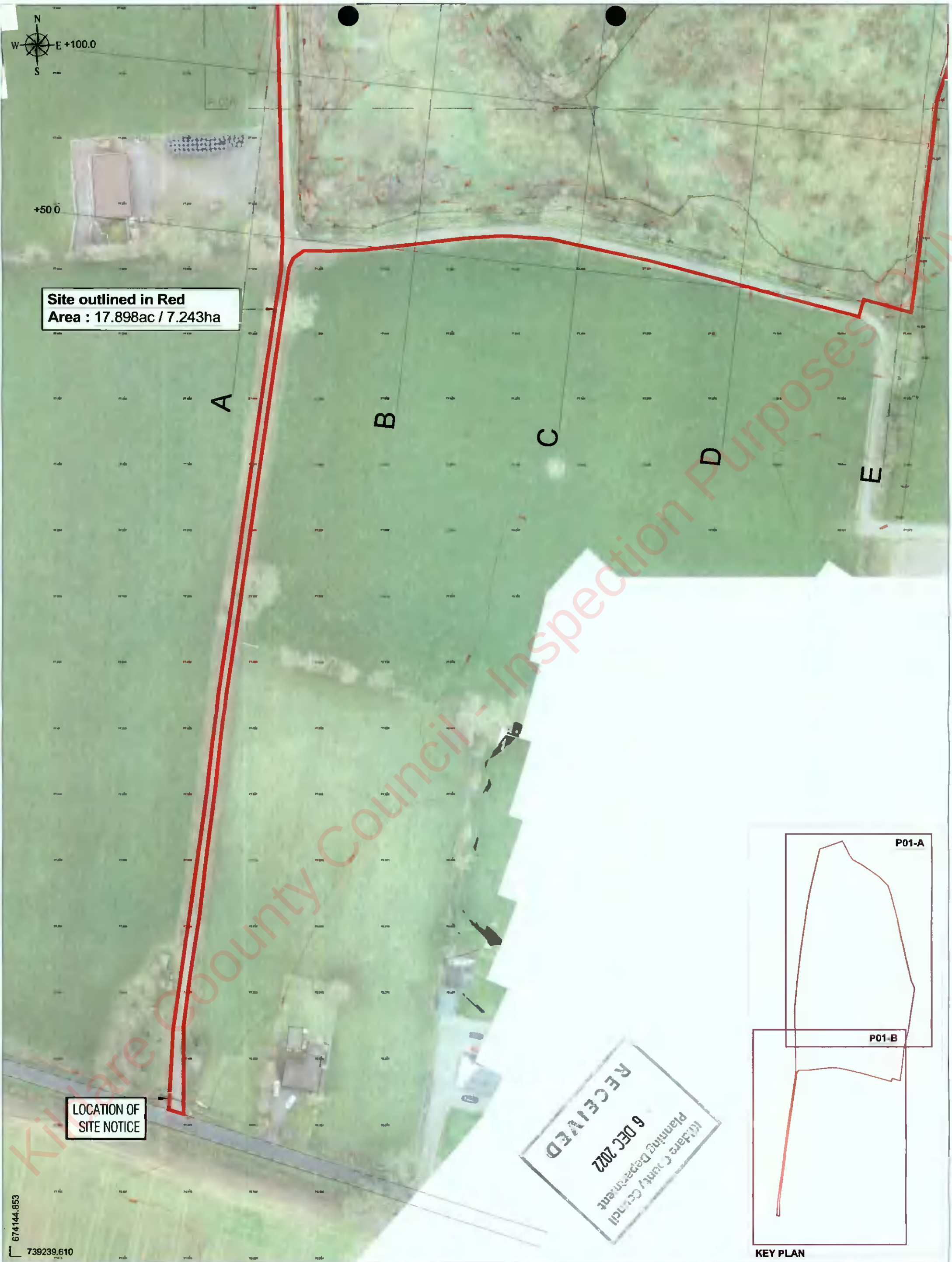
EMAIL:
info@enviroguide.ie
PHONE:
+353 (01) 5654730
WEBSITE:
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Johnstown Bridge
DRAWING TITLE:
Site Survey M14
DEPARTMENT: Engineering
DRAWING STATUS: Planning

CLIENT:
TD Doran
LOCATION:
Johnstown Bridge,
Cibola,
Co Kildare

DRAWN BY: RH/SP
CHECKED: SP/RH
DRAWING NO: 0-DIA
DATE: 18/11/2022
SCALE: 1:500
@ A1



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CONSULTING

ADDRESS:
30 Core C, Black T,
The Plaza Park West,
Dublin 12, D12 F8T9.

EMAIL:
info@enviroguide.ie

PHONE:
+353 (0)1 5654730

WEBSITE:
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ENGINEERS
IRELAND

Johnstown Bridge

DRAWING TITLE:
Site Survey Report

DEPARTMENT: Engineering

DRAWING STATUS:
Planning

CLIENT:
RT (Public)

LOCATION:
Johnstown Bridge,
Lough,
Co. Wick.

DRAWN BY: 24-3P
CHECKED: 24-3P

DRAWING NO: P01-B
DATE: 08/11/2022

SCALE: 1:500
@ A1



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 70 Core C, Block 7L
 The Plaza Park West
 Dublin 12 D12F3TH

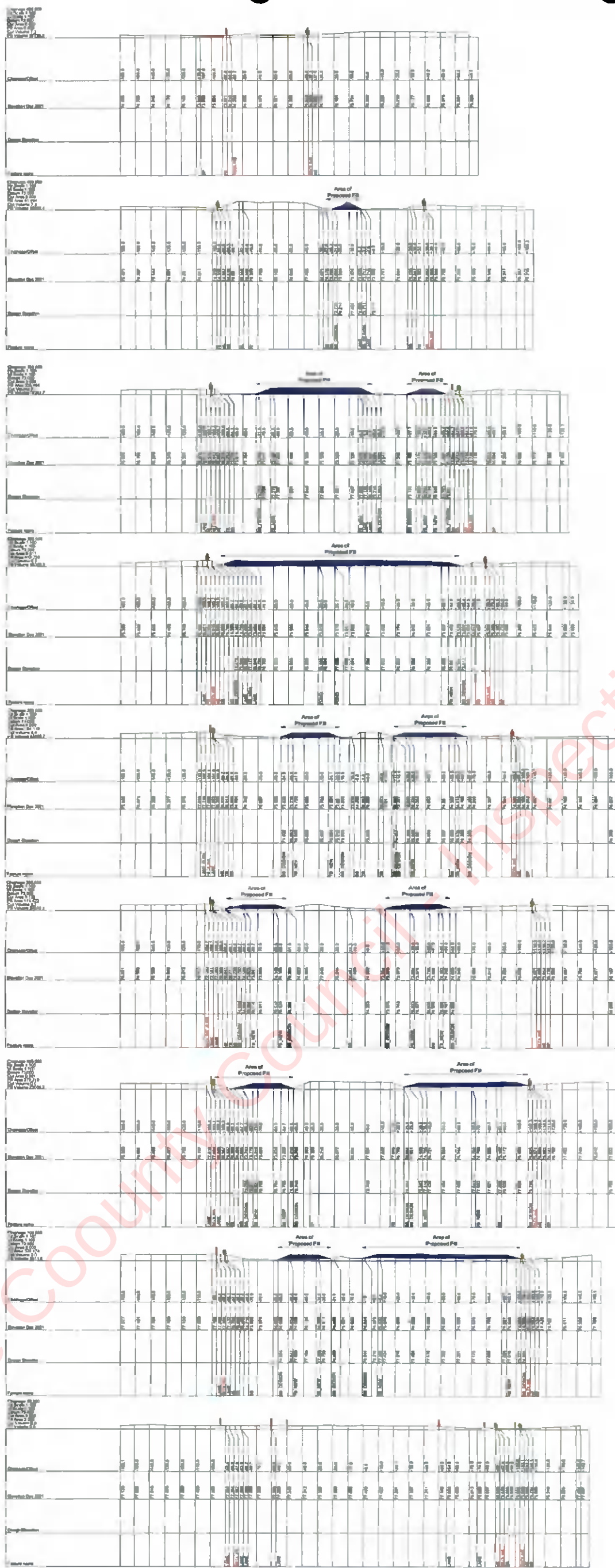
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 PHONE:
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Johnstown Bridge
 DRAWING TITLE:
 Site Survey
 DEPARTMENT: Engineering DRAWING STATUS: Planning

CLIENT:
 Kildare
 LOCATION:
 Johnstown Bridge
 Gibons
 Co. Kildare

DRAWN BY: RHC CHECKED: SHJ
 DRAWING NO: H102 DATE: 18/11/2022
 SCALE: 1:500 @ A2



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Johnstown Bridge
Planning Department



ADDRESS:
10000 Highway 101
The Plains, VA 20131
TEL: 703.261.1234

EMAIL:
info@enviroguide.com
PHONE:
703.261.1234
WEBSITE:
www.enviroguide.com



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Johnstown Bridge

DRAWING TITLE:

Final Section

DEPARTMENT: DRAWING STATUS:

Planning Department

CLIENT:

Johnstown Bridge

LOCATION:

10000 Highway 101

DATE:

6 DEC 2022

DRAWN BY: CHECKED:

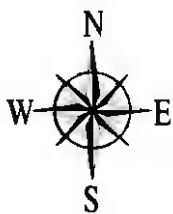
JH/PJ

DRAWING NO: DATE:

10000 Highway 101

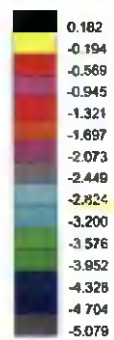
SCALE:

@ A2



Area 1
Fill Outlined in Magenta
Area : 6.715ac / 2.718ha

Depth of Fill



Area 2
Fill Outlined in Magenta
Area : 2.400ac / 0.971ha



ADDRESS:
30 Cork E. Block 71,
The Plaza, Park West,
Dublin D12 F2FN

EMAIL:
info@enviroguide.ie

PHONE:
+353 (0)1 5654730

WEBSITE:
www.enviroguide.ie



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Johnstown Bridge

DRAWING TITLE:

supachyte / Depth Map

DEPARTMENT: DRAWING STATUS:
Engineering Planning

CLIENT:

27 Darrin

LOCATION:

Johnstown Bridge,
Kildare,
Co. Kildare

DRAWN BY:

PH-SP

DRAWING NO:

010

SCALE:

1:1000

CHECKED:

SE-IR

DATE:

08/12/22

@ A2



Untouched Areas
Hatched Green
Area : 7.42ac / 3.00ha

Pigo - Site Office
& Welfare Facilities

Inspection &
Quarantine Area

Weighbridge

Area 1
Fill Outlined in Magenta
Area : 6.715ac / 2.718ha

Existing Entrance
Lane to be used

Area 2
Fill Outlined in Magenta
Area : 2.400ac / 0.971ha

Site outlined in Red
Area : 17.698ac / 7.243ha

Woolwash

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6 DEC 2022
Kildare County Council
Planning Department



ADDRESS:
100-102, New West
Dublin 24, D24 RY14

EMAIL:
info@enviroguide.ie

PHONE:
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Johnstown Bridge

DRAWING TITLE:

Proposed Land Layout

DEPARTMENT: DRAWING STATUS:

10/11/2022 Planning

CLIENT:

Johnstown Bridge

LOCATION:

Johnstown Bridge

10/11/2022 Planning

DRAWN BY: CHECKED:

10/11/2022

DRAWING NO: DATE:

10/11/2022

SCALE: @ A1



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Appendix B



Enviroguide
3D Core C
Block 71
The Plaza
Park West
Ireland
D12F 9TN

Attention : Candice Serbu
Date : 21st September, 2022
Your reference :
Our reference : Test Report 22/14927 Batch 1
Location : Johnstown
Date samples received : 14th September, 2022
Status : Final Report
Issue : 1

Five samples were received for analysis on 14th September, 2022 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Simon Gomery BSc
Project Manager



Please include all sections of this report if it is reproduced

Element Materials Technology

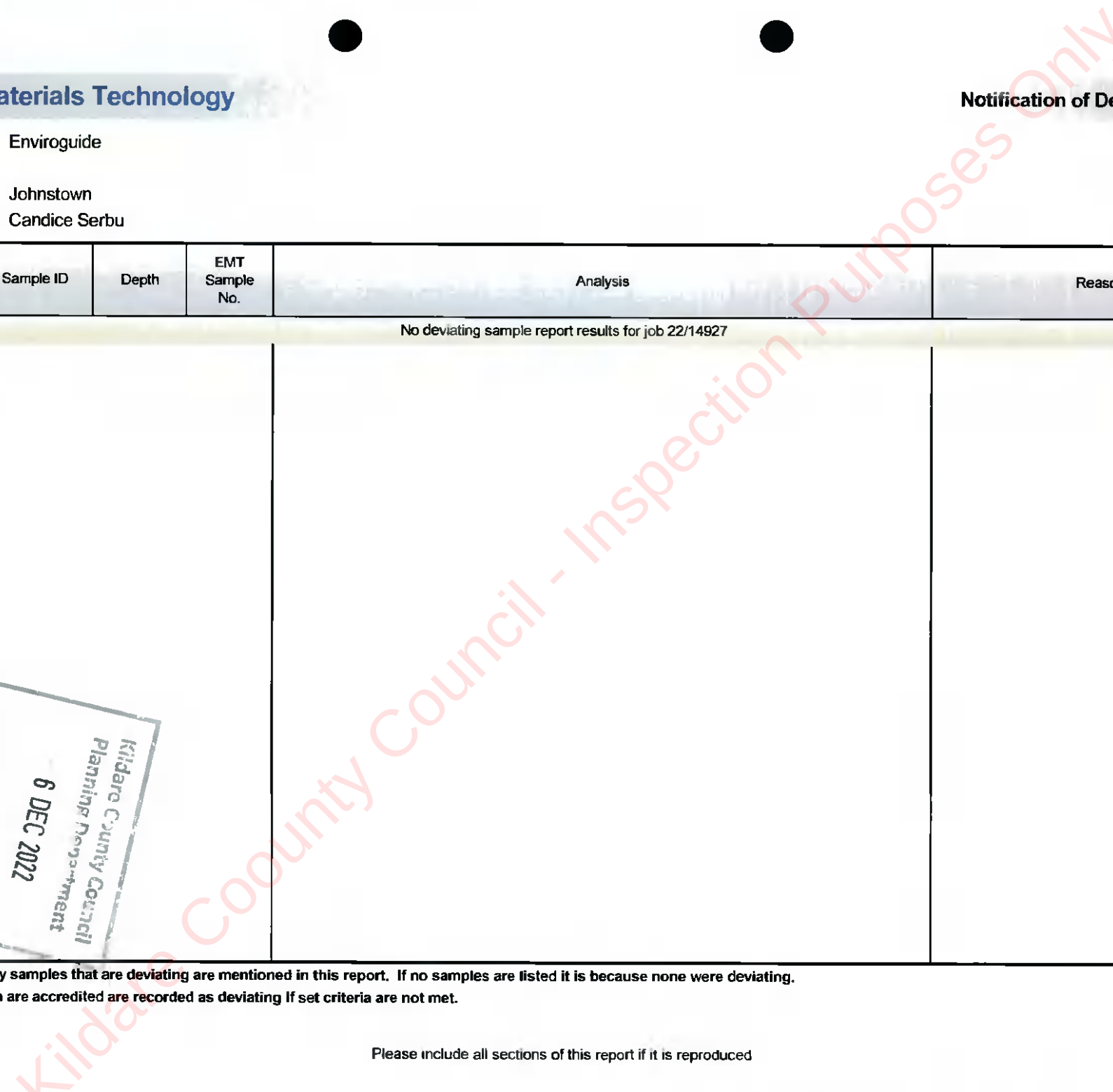
Notification of Deviating Samples

Client Name: Enviroguide

Reference:

Location: Johnstown

Contact: Candice Serbu

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 22/14927						
 						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 22/14927

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific. any other liquids are outside our scope of accreditation

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

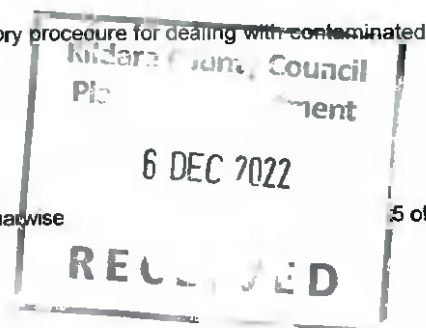
Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.



NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.



ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required
M	MCERTS accredited
NA	Not applicable
NAD	No Asbestos Detected
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range



HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only
AR	Aromatics only
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
-	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.



EMT Job No: 22/14927

Test Method No	Description	Prep Method No (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM0	Not available	PM0	No preparation is required				
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C6-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex				
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry). WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev 2, Dec 1996; Modified BS EN ISO 11885:2009 SOILS by Modified USEP 6010B, Rev 2, Dec.1996; Modified EPA Method 3050B, Rev 2, Dec 1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM36	Modified US EPA method 6015B v2:1996 Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check when requested	PM12	Modified US EPA method 5021A v2:2014 Preparation of solid and liquid samples for GC headspace analysis				
TM36	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev 2 1993), o-Phosphate 365.2 (Rev 2 1993), TON 353.1 (Rev 2 1993) Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev 2 1993) – All anions comparable to BS ISO 15923-1:2013	PM0	No preparation is required				
TM75	Modified US EPA method 310.1 (1978) Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required				
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1996)	PM0	No preparation is required				





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Appendix C

Kildare Coounty Council - Inspection Purposes Only



175.2304 Johnstown Bridge ATC
ATC
15014 Johnstown Bridge
Tue 17-May-2022

6 DEC 2022
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IDASO



Survey Name: 175 22304 Johnstown Bridge ATC
 Site: ATC
 Location: L5014, Johnstownbridge
 Date: Tue 17 May 2022

Speed Survey

Cummulative 85% Speed: 78.12 KPH
 Cummulative Minimum Speed: 5.35 KPH
 Cummulative Maximum Speed: 113.79 KPH
 Cummulative Average Speed: 65.54 KPH

Westbound (A => B)

No. of Vehicles: 327
 85% Speed: 75.02 KPH
 Minimum Speed: 5.35 KPH
 Maximum Speed: 98.43 KPH
 Average Speed: 63.58 KPH

Speed KPH	No. In Range
0-10	1
10-20	2
20-30	2
30-40	5
40-50	31
50-60	74
60-70	105
70-80	86
80-90	20
90-100	1
100-110	0
110-120	0
120-130	0
130-140	0
140-150	0
150-160	0
160-170	0
170-180	0
180-190	0
190-200	0



Eastbound (B => A)

No. of Vehicles: 332
 85% Speed: 80.82 KPH
 Minimum Speed: 9.99 KPH
 Maximum Speed: 113.79 KPH
 Average Speed: 67.48 KPH

Speed KPH	No. In Range
0-10	1
10-20	1
20-30	1
30-40	8
40-50	25
50-60	53
60-70	99
70-80	92
80-90	33
90-100	16
100-110	1
110-120	2
120-130	0
130-140	0
140-150	0
150-160	0
160-170	0
170-180	0
180-190	0
190-200	0

