Environmental Impact Assessment Report (EIAR)

Howick O’Brien Consulting Engineers

OBO Buttimer Engineering

Cahir Abbey Industrial Estate, Cahir, Co. Tipperary

Environmental Impact Assessment Report

Proposed Karting Facility

Project no:

19112

Environmental Impact Assessment Report:

Proposed Karting Facility, Cahir Abbey Industrial Estate, Cahir, Co. Tipperary.

Client:

Howick O'Brien Consulting Engineers

OBO Buttimer Engineering

19112-EIAR-01 07.01.20	0 issue to client	S. Sheehy	C. Dixon

DixonBrosnan, 12 Steam Packet House, Railway Street, Passage West, Co. Cork

Tel 086 8511 437 www.dixonbrosnan.com

Overview

This Environmental Impact Assessment Report (EIAR) has been prepared by DixonBrosnan on the instructions of on the instructions of the applicant for a karting track development at Cahir, Co. Tipperary.

Documents attached to the EIAR are as follows:

Appendix 1 AA screening report

Appendix 2 Flood Risk Assessment

Appendix 3 PICADY analysis Traffic

Appendix 4 Illuminance study

Contents

Non-technical summary

Introduction

Planning permission in being sought for a karting track development at Cahir, Co. Tipperary. The proposed development site is located on the northern fringes of Cahir town. The site of the proposed track currently consists of cleared level ground at the southeast corner of an existing business park. The proposed development site is within the landownership of the applicant who runs an existing business (Buttimer Engineering) at this location. Based on an initial assessment of the site and in line with EPA guidelines, the following topics are addressed in this EIAR to varying levels of detail: Noise & vibration, Land & soils, Material assets & traffic, Air quality & climate, Population & human health, Ecology, Landscape & visual impact, Archaeology & cultural heritage and Land, Soil and Water.

Site location

The proposed development site is located on the edge of Cahir town, just over 1km NNW of the town centre within the Cahir Abbey Industrial Estate. Entrance to the industrial estate (and the proposed development site) is from the Upper Abbey Road. On the western side of the industrial estate, residential development extends along both sides of the R640. This residential development is formed by a mixture of period dwellings, small residential estates, and one-off dwellings. To the north of the industrial estate, as the R640 approaches the R639, the landscape becomes more open and begins to rise gradually, and the urban environment gives way to scattered one-off dwellings. The local landscape is urban in character. Cahir, with an approximate population of 3,600, is the only settlement in the immediate study area.

Planning context

Cahir town lies in the Cahir electoral area. It is designated as a secondary service centre in Tipperary County Council's *County Tipperary Local Development Strategy 2014-2020* (2016). This designation aims to strengthen these service centres in their retail, employment and heritage functions and their overall perception as desirable places to live and work. The District Service Centres aim to provide supporting roles to Clonmel (the Major Town in South Tipperary) but, in the context of the settlement strategy, will adopt their own role as service centres offering an improved service provision in terms of retail, employment and community facilities to their own hinterlands.

South Tipperary contains a rich and varied landscape and a wealth of heritage assets that form the basis for the high level of amenity in the county. While the county development plan does not include any specific designations for the proposed development site or any adjacent lands, large parts of Cahir town centre have been designated as an Architectural Conservation Area (ACA). ACA's are places, areas, groups of structures or townscapes, that are of special architectural, historic, archaeological, artistic, cultural, scientific, social or technical character, or that contribute to the appreciation of a protected structure.

Proposed development

Permission is being sought for a karting track development at Cahir Abbey Industrial Estate, Cahir, Co. Tipperary. The proposed development will comprise the following; a building comprising changing rooms and a W.C., a building for the storing of and general maintenance of the karts the installation of an over ground gas storage tank for the refuelling of the karts 4) perimeter fencing 5) general signage on the building described in item 1 above 6) general signage on the perimeter fencing 7) the change of use of the land from industrial to a karting track 8) hardstanding of the proposed areas for karting track 9) general lighting 10) and all other site development works

It is proposed to install an outdoor karting track at the southeast corner of the site.The track will consist of a tarmac area at the centre of the proposed development site. While the shape of the hardstanding area will remain constant, the layout shown will change weekly to give varying degrees of complexity for users. Although operating times of 1200-2200 h Monday-Sunday are proposed, including public holidays, it is likely that the track will be idle for much of the time. The peak time of activity is expected to be Saturday 1200-1800 h, and during these hours the track is likely to be in use almost continuously apart from initiation periods at the start of each race.

The karts will use four-stroke gas-powered internal combustion engine karts provided by a supplier such as Sodikart with a likely engine capacity of 270 cc. The track will be restricted to a maximum of 10 karts at any time. Maintenance activities undertaken within a proposed workshop near the northeast corner.

Two new buildings will be constructed, a changing room and toilet area located at the southwestern corner of the site and a workshop area located at the northeast corner. These will be steel cladded buildings. The site will be accessed via an existing road and footpath located at the southwest of the proposed development site.

Construction is expected to take four months, beginning in March and completing in June 2020. No new car parking spaces will be required. An existing car park, owned by the applicant, at the south west corner of the proposed development site will be used for visitors and staff. An acoustic barrier will be erected at the southwest corner in front of the existing weldmesh fence. Effluent from the proposed development will be discharged to the existing sewer network and conveyed to Cahir WWTP for treatment prior to discharging to the River Suir. As part of the proposed development a surface water drainage scheme has been designed in accordance with SuDs principles.

Noise & vibration

A noise assessment identified receptors in the surrounding landscape, potential sources of noise and mitigation. There are no noise standards or guidance documents specifically applicable to karting noise. Thus there are no specific karting noise criteria available. The local noise environment is dominated by road traffic noise, arising from several locations. Site inspections indicate that there are no other noise sources of major significance. In order to quantify the ambient noise environment, noise monitoring was carried out in the vicinity of Cahir Abbey House,

the nearest noise sensitive location to the site. Following discussions with the applicant, it has been agreed that the proposed development will benefit from inclusion of acoustic screening, namely an acoustic barrier at the southwest corner and other mitigation measures in relation to operation were also specified. The assessment indicates that noise emissions from karts using the proposed track will give rise to noise levels at noise sensitive locations which do not exceed the 55 dB daytime criterion or 45 dB evening criterion. Cumulative impacts are therefore not expected to arise.

Water, land and soils

The existing baseline conditions and character of the land, soil and geological characteristics of the site and an assessment of water resources and impacts are presented. The landscape around Cahir is dominated by two major geographical features; the River Suir and the Galtee Mountains. The main superficial deposit overlying the site is gravels, derived from Devonian sandstones. No karst geohazards or landslides are mapped on the site. In the wider area there are few karst landforms. No geological heritage sites are present on the site of the proposed development. The proposed development is located within the Suir Catchment and is located approximately 250 m north of the River Suir main channel. The Lower River Suir SAC is located 160m south-southeast. No direct hydrological connection to this site has been identified. The bedrock underlying the proposed site is classified as a Regionally Important Aquifer, with fissured bedrock. The GSI has classified the vulnerability of the aquifer underlying the west of the site as High at Cahir Abbey. Potential impacts relate to loss of soil or bedrock and impacts on groundwater and surface water. A range of standard mitigation procedures will be employed during construction phase to prevent impacts on water quality. All identified impacts have a residual environmental impact rating of imperceptible.

Material assets

Material assets in the context of this chapter refers to the physical resources in the environment of human origin, as those of a natural origin are addressed elsewhere in the EIAR. There will be increases in noise during construction and operation. A Construction Traffic Management Plan will mitigate traffic impacts. Overall it is concluded that there will be short-term minor impacts during the construction phase of the development, however the long-term residual impacts will be negligible.

Air quality & climate

This EIAR chapter identifies, describes and assesses the likely impacts on ambient air quality from the proposed development during constructions and operation. The proposed development is located in a rural area and is thus classed as ‘Zone D’ under Directive 2008/50/EC on ambient air quality and cleaner air for Europe (2008). The prevailing wind direction is from the west and south west. There are a number of dwellings scattered along the R640 as well as Cahir Abbey House, which can be considered as sensitive receptors with respect to dust. No other receptor types which could be considered highly sensitive such as hospitals, nursing homes, hi-tech industries etc. are present. During the construction phase there will be work involving construction

machinery and vehicles which have the potential to generate fugitive windblown dust and exhaust emissions.

As the karts are gas powered the emissions of primary concern relate to dust generation and the potential for impacts on sensitive receptors outside the site boundary. Due to the predominant south-westerly winds, receptors located to the north east are most likely to experience elevated dust levels. It is noted that the large disused quarry to the east and north east provides a buffer which minimises the potential for impacts from fugitive dust emissions.

The closest dwelling to the north east and east are located 758m and 610m respectively from the proposed development. At that distance impacts from fugitive dust emissions during construction and operation will be negligible. To the south the closest receptor is Cahir Abbey House which is screened by existing walls. To the west dwellings are screened by the existing industrial estate and there are no dwellings in proximity to the site to the north. It is noted that winds from the north, south and east are less common and thus the potential for fugitive dust emissions are lower. Best practice mitigation measures will be implemented during the construction phase which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. Once the mitigation measures are implemented, there will be no residual impacts of significance on air quality or climate from the construction or operational phases of the proposed development.

Population & human health

This chapter considers the impact of the proposed development in the context of population and settlement, land use, employment and other impacts of a social and economic nature. Land in the immediate vicinity of the proposed development site is dominated by a mix of light industrial and residential use and outside this zone, land use is dominated by agriculture. The proposed development site is located within an area zoned for *Light Industry and Employment*. Lands to the north and west are also within this zone. The proposed southern boundary runs adjacent to lands zoned *Agricultural*. The eastern proposed site boundary abuts land zoned as an *Integrated Tourism & Recreation Area*. A flood risk assessment concluded that will be no increased risk of flooding as a result of the proposed kart track development. The site-specific modelling has demonstrated that there will be no increased risk of flooding either within the site or to third parties from the proposed development. The construction phase of the proposed development is likely to have a positive moderate direct impact via increased temporary employment. Once operational there will be up to ten individuals employed here. Furthermore the development will benefit the local economy and be a positive move towards meeting the aims of the Cahir Local Area Plan. The proposed development is in line with the aims set out in Cahir LAP (2011) and will encourage tourists to increase their expenditure in the town and extend their stay.

Overall, given the scale and nature of the proposed development, the long-term impact on human health and visual amenity is predicted to be minor in the short term and negligible in the long-term. The risk from flooding or that the development will cause increased flooding is negligible.

Ecology

This Chapter provides an assessment of the impacts (and resulting effects) of the proposed karting track development at Cahir Abbey Industrial Estate, Cahir, Co. Tipperary, on terrestrial and aquatic biodiversity in the receiving environment. This appraisal is based on surveys of the proposed site and surrounding area and a review of desktop data. There is no direct hydrological connection to any of the Natura 2000 sites and impacts on same are specifically addressed in the AA screening report which has been submitted as part of this application. The AA screening report notes that following a comprehensive evaluation of the potential direct, indirect and cumulative impacts on the qualifying interests and conservation objectives for Natura 2000 sites, it has been concluded that the proposed development will not have an adverse effect on the integrity of Natura 2000 sites. The proposed development site is dominated by low value habitats (Recolonising bare ground (ED3)/ Spoil and bare ground (ED2) and Scrub (WS1). No rare flora occur. No evidence of mammals including bats or otter were recorded. No streams, drains or rivers were recorded.

Overall the development will impact primarily on low value habitats. No direct impact on aquatic habitats will occur. No significant invasive species were recorded within the proposed development site boundary.

The impacts on habitats will be slight in the long-term. The impact of the proposed development of birds and mammals is predicted to be localised and minor. The project design has taken into account the necessity to protect surface water from impacts associated with construction works and operation of the proposed development. Appropriate mitigation measures and operational procedures have also been specified within this EIAR. The impact on water quality is predicted to be imperceptible in the long-term.

Landscape & visual impact

This EIAR Chapter identifies, describes and assesses the likely impacts on landscape from the proposed development. A desktop study was undertaken to determine the existing landscape.The landscape impact assessment describes the nature and scale of changes to the landscape elements and character and outlines the effect of the proposed development on the landscape character of the area. Landscape impacts may be viewed as positive, neutral or negative. The landscape around Cahir is dominated by two major geographical features; the River Suir and the Galtee Mountains. The *Tipperary Draft Landscape Character Assessment* (2016) categorises the lands to the north, east and south of Cahir town as ‘River Suir Central Plain’. This area is probably better known as the Golden Vale for the rich agricultural grassland which dominates the landscape. Due to the topography within the region, extended views are mainly permitted only from higher elevations, largely along the Galtee foothills to the west of the town. Regional routes R670 (N8) extends to the northeast and south of the town, and parts of this route has views which extend several kilometres towards the Galtee Mountains.

South Tipperary contains a rich and varied landscape and a wealth of heritage assets that form the basis for the high level of amenity in the county. While the county development plan does not include any specific designations for the proposed development site or any adjacent lands, large parts of Cahir town centre have been designated as an Architectural Conservation Area (ACA).

The proposed development site is only visible from the higher ground to the west of the town, along a minor road, which is included in part of the Tipperary Heritage Way walking trail. There are a number of dwellings located along the R640, 280-300 m from the proposed track. The number of dwellings within 500 m exceeds 150, with the majority of these lying along or close to the R640 to the west and southwest of the site. None of these is afforded views of the site due to screening provided by existing buildings at the industrial estate. A number of houses on the hillside 1 km to the northwest and a minor road are afforded views over part of the study site. No significant historical buildings within the town or surrounding area have views of the proposed development site.

Overall, the visual impact resulting from the proposed development will not differ significantly from the impact associated with the existing industrial estate. For most of the dwellings and roads in the area, the proposed development will not be seen and the proposed development will not be a highly intrusive element in the context of the existing landscape. It is concluded that the development as proposed will not have a significant impact on views or on amenity value and the overall impact on the landscape will be slight.

Archaeology & cultural heritage

The proposed development is on a brown-field site. Previous work on the site included some reduction of ground levels and laying of a temporary surface of stone chippings. The proposed site is to the west of a redundant quarry and separated from the quarry and Cahir Abbey House by a quarry access road. Existing buildings and the proposed track development are screened on the east side from Caher Abbey House by judicious planting There are no archaeological sites mapped within the proposed development zone. The historic town of Cahir (RMPi TS075-048) is located on the River Suir. The proposed development site has no known or previously recorded archaeological sites. The architectural heritage closest to the site is Caher Abbey house which is separated from the proposed development by a quarry access road and is also screened by a tree-belt.

The proposed development site has been altered and is now a stone chipped surface with a concrete road to the west. The topsoil and subsoil was presumably stripped from the surface before the stone chippings and concrete road surface were laid; the reduction of ground levels in the past would have removed any layers of potential archaeological interest.

The site is now a brownfield site. The impact of developing a karting track and ancillary works is minimal on the archaeological/cultural heritage landscape.

Traffic

This chapter of the EIAR quantifies and assesses the impact of traffic generated by the proposed development on the existing local road network, and recommends mitigation measures, as appropriate. Existing baseline traffic volumes on the surrounding local road network have been established on the basis of on-site traffic counts

Cahir Business Park has a single access road which forms a Stop controlled T-junction with the R640 Tipperary Road. There is a dedicated right-turn lane on the R640 Tipperary Road at the junction, with a total road carriageway width of circa 10 metres, footways and east side street lighting.

The Cahir Business Park access road has a typical road carriageway width of 7.0 metres with a south side footway locally at its R640 junction. Approximately 55 metres east of its R640 junction, the Business Park has an internal access roads Yield junction. East of this internal junction, the internal access road serving the proposed development site has a typical road carriageway width of 6.0 metres.

The R640 Cahir Business Park access road junction and Business Park access roads are located within the Cahir 50 km/hour urban speed limit zone.

Approximately 950 metres south of Cahir Business Park, the R640 extends along Abbey Street to its Stop T-junction with Mitchelstown Road, on the west side of Cahir town centre. The Abbey Street/Mitchelstown Road junction includes dedicated left and right-turn lanes on Abbey Street and a right-turn lane on Mitchelestown Road

The proposed development would employ five to 10 staff, with up to three staff in attendance at any one time. The proposed development would generate up to 85 daily users and staff. Total daily vehicles generated by the proposed development would be up to 73 vehicles inbound and 73 vehicles outbound, on the basis of a vehicle occupancy of 1.2 persons/vehicle and up to two service/delivery vehicles. This includes all vehicles, including vehicles generated by the proposed driving school sessions, which would have up five attendees at each session. The proposed development would not have a significant operational traffic impact, and no significant mitigation measures would be required. On the basis of the EPA Guidelines, the proposed construction phase would have imperceptible to not significant temporary traffic effects.

DixonBrosnan

environmental consultants

EIAR main volume

1. Introduction

1.1. Proposed Development

Planning permission in being sought for a karting track development at Cahir, Co. Tipperary. The proposed development site is located on the northern fringes of Cahir town, just over 1km from the town centre within the Cahir Abbey Industrial Estate Park (**Figure 1.1**). The R640 meets the R639 300m north of the industrial estate. The R639 runs parallel to the M8 motorway. The applicant's site lies at the southeast corner of the industrial estate. There are a number of industrial and commercial units located with the industrial estate including an engineering company, builder's suppliers, a tile store, kitchen showroom, carpet store, a furniture store, a food processing plant, a candle manufacturer and a café. The site of the proposed track currently consists of cleared level ground at the southeast corner of the Business Park.

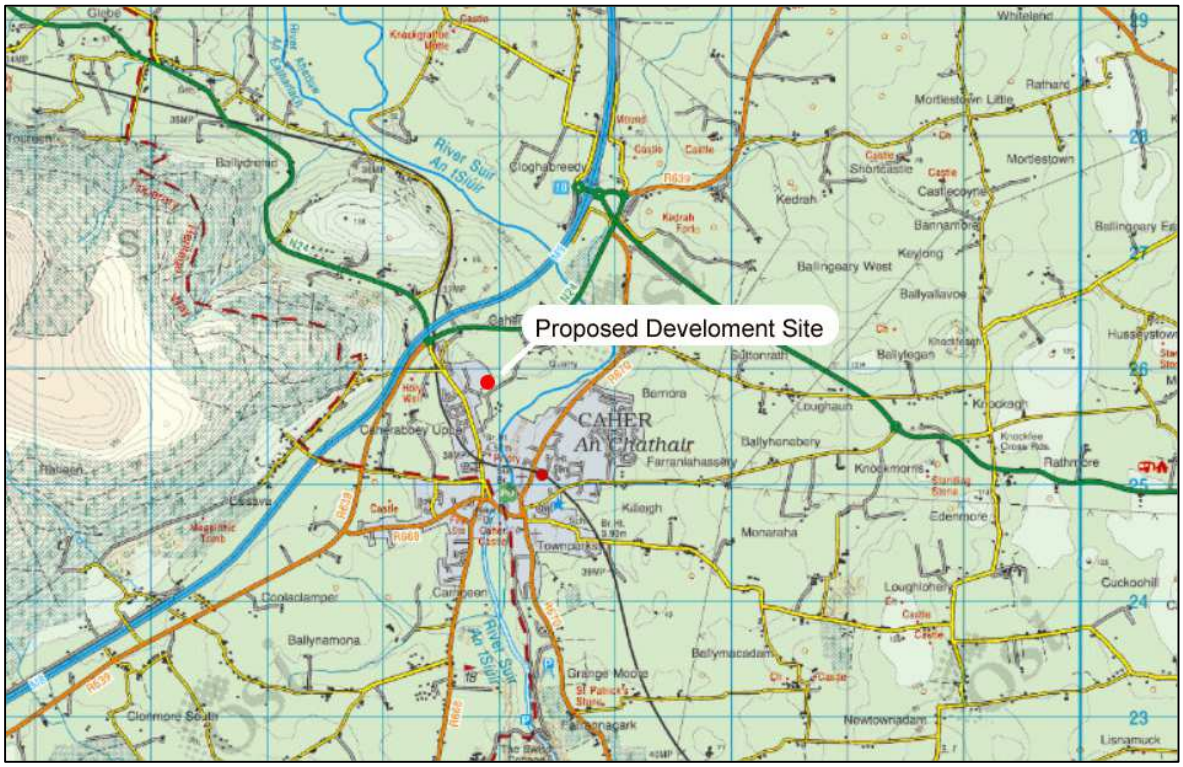


Figure 1.1. Location of Proposed Development Site

The northern boundary of the applicant's site is formed by an industrial unit. The north western and western site boundaries adjoin the industrial estate. The southern boundary is formed by an unpaved track. The eastern and north-eastern boundaries adjoin disturbed ground and scrub associated with a large neighbouring quarry which is now inactive. The site is currently accessed by a gate at the southwest corner of the site.

The main elements of the planning applications are as follows:

- a building comprising changing rooms and a W.C.
- a building for the storing of and general maintenance of the karts
- the installation of an over ground gas storage tank for the refuelling of the karts
- perimeter fencing
- general signage on building
- general signage on the perimeter fencing
- the change of use of the land from industrial to a karting track
- hardstanding of the proposed areas for karting track
- general lighting
- and all other site development works

These are described in more detail in **Chapter 3, Description of Proposed Development**.

1.2 EIAR scope

The general background to the requirement for Environmental Impact Assessment (herein referred to as EIA) for certain types and scales of development is set out in the EIA Directives (2011/92/EU and 2014/52/EU); the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (the majority of which came into operation in September 2018), the Planning and Development Acts 2000 (as amended) and the Planning and Development Regulations 2001 – 2018.

The term EIAR was introduced by Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment. The amended Directive sets out the required content of an EIAR, and includes a list of environmental factors which are to be addressed as follows:

- Population and human health.
- Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC.
- Land, soil, water, air and climate.
- Material assets, cultural heritage and the landscape.
- The interaction between the foregoing.

This EIAR was compiled in response to a request for further information received from Tipperary County Council in relation to planning application on behalf of the applicant Buttimer Engineering to construct a karting track an all other site development works at Cahir Abbey Industrial Estate, Cahir Abbey Lower & Cahir Abbey Upper, Cahir, Co. Tipperary.

This EIAR has been prepared pursuant to Section 175 of the Planning and Development Act, 2000 as amended ('The Act'), Part 10 Planning and Development Regulations 2001 -2018 and any other applicable legislation and guidance. Section 175 of the Act provides for environmental impact assessment of certain development carried out by or on behalf of local authorities. Under

Section 175 of the Act, Proposed development in respect of which an environmental impact assessment report has been prepared by a local authority shall not be carried out unless the Board has approved it with or without modifications.

The listed factors are used to formulate EIAR layout and content. Typically, the factors are addressed through headings such as water quality, noise and vibration, etc. This content may be amended through an initial scoping exercise including:

- EPA guidance described below.
- A review of the proposed development.
- A review of similar developments.

Based on an initial assessment of the site the following topics are addressed in this EIAR to varying levels of detail:

- Noise & vibration.
- Land & soils
- Material assets & traffic.
- Air quality & climate.
- Population & human health.
- Ecology.
- Landscape & visual impact.
- Archaeology & cultural heritage.
- Land, Soil and water.
- Interactions.

The EIAR was prepared having regard to the following EPA documents:

- *Advice notes on current practice in the preparation of environmental impact statements* (draft, 2015).
- *Guidelines on the information to be contained in environmental impact assessment reports* (draft, 2017).

Each of the topics addressed in this EIAR was assessed with reference to the EPA's draft 2017 document in particular. Thus, the various topic chapters include an assessment of the baseline scenario, the likely future receiving environment, an assessment of unplanned events, an assessment of impacts, and recommended mitigation measures.

1.3 EIAR preparation

The EIAR document was assembled by DixonBrosnan Environmental Consultants. The assessment process was coordinated by DixonBrosnan with the assistance of the Howick O'Brien Consulting Engineers. **Table 1.1** sets out the list of EIAR contributors.

Table 1.1. EIAR Chapters and Contributors.

Chapter	Contributor
Introductory and project description chapters	Carl Dixon MSc and Sorcha Sheehy PhD
Noise & vibration	Damian Brosnan MSc.
Land & soils	Carl Dixon MSc and Sorcha Sheehy PhD
Material assets & traffic	Sorcha Sheehy PhD
Air quality & climate	Carl Dixon MSc.
Population & human health	Sorcha Sheehy PhD
Ecology	Carl Dixon MSc and Ian McDermott MSc
Landscape & visual impact	Carl Dixon MSc and Mark Donnelly BSc
Water quality	Carl Dixon MSc.
Cultural heritage	Rose M. Cleary, MA, MIAI, FSA

No particular difficulties were encountered in the preparation of the EIAR. The assessment of impacts was greatly facilitated by the following:

- The location within a brownfield site
- The lack of existing buildings within the proposed development site
- The location of the proposed development on the periphery of the town
- Local topography which ensures that the proposed development site is largely hidden from view
- Presence of a large disused quarry along the northern and western boundary which forms a buffer in respect of noise and air impacts.

This EIAR was coordinated by Carl Dixon MSc. (Ecological Monitoring) Carl Dixon MSc (Ecology) is a senior environmental consultant who has over 20 years' experience in ecological assessments, air quality assessments and water quality assessments. He also has experience in mammal surveys, invasive species surveys and ecological supervision of large-scale projects. Projects in recent years include the Waste to Energy Facility Ringaskiddy, Shannon LNG Project, supervision of the Fermoy Flood Relief Scheme, Skibbereen Flood Relief Scheme, Upgrade of Mallow WWTP Scheme, Douglas Flood Relief Scheme, Great Island Gas Pipeline etc.

Ian McDermott MSc (Ecology) is an experienced with particular expertise in surveying for invasive species, mammal and bird surveys. He carries out ongoing water quality surveys for a range of projects including quarries, WWTPs etc. Likewise, he has carried out ecological surveys for a range of projects including industrial developments, pipelines, quarries, agricultural units etc.

The author, Mark Donnelly, holds a BSc. Hons in Forestry from Bangor University, Wales, and is a member of the Institute of Chartered Foresters. He worked as an arboricultural consultant for the National Trust in Wales for 22 years and was a lecturer in Forest Ecology at Bangor University. In Ireland, he has completed landscape assessments for a range of projects including wind farms, quarries, local authorities, housing developments, roads and pipelines.

Sorcha Sheehy is an experienced ecological consultant who has worked on Screening/NIS's for a range of small and large-scale projects with particular expertise in assessing impacts on birds. Recent projects include bird risk assessments for Dublin and Cork Airports, Waste to Energy Facility Ringaskiddy and Water Storage Schemes for Irish Water.

Damian Brosnan MSc. is an experienced environmental consultant with over 20 years experience who specialises in noise. Rose M. Cleary, MA, MIAI, FSA is an experienced archaeologist who has worked on a range of projects throughout Ireland.

1.4 Planning Background

Cahir Abbey Industrial Estate was originally granted planning in 1999 (ref 99/510) with the construction of industrial warehouse units with ancillary space for retail and office units. This was after this area of Caher Abbey Lower was rezoned from *Agricultural* land use to *Industrial* as part of the Cahir Abbey Lower Master Plan. Since that time there have been several further planning applications granted within the Industrial Estate for industrial units and associated works.

The applicant Buttimer Engineering was founded in 1978 and now operates across a range of industries, providing design, fabrication, procurement, installation, maintenance, project management and engineering services. The company originally served in the Irish dairy industry before broadening its capabilities into wider agri-industry, mining pharmaceuticals, power generation and infrastructure sectors.

Buttimer Engineering has grown into an international mechanical engineering company; while it serves an array of industries the core competencies have remained the same: an expertise in the mechanical handling of bulk products, and fabrication of high-quality steel structures and equipment. Buttimer opened its first international subsidiary – Buttimer Polska Sp. z o. o. – in Warsaw, Poland in 2005 and has grown a significant and profitable independent business serving the grains, seeds and port industries in that market. Buttimer Engineering has also completed projects for clients in Africa, the Middle East, South America and Asia; the company is increasingly offering its expertise and services to projects outside its domestic markets of Ireland, the UK and Poland.

1.5 Alternatives

It is proposed that the karting track will be provided within an unused area of the applicant's current landholding and provides the applicant with an opportunity to diversify and make maximum use of the available space. This development will provide an additional income stream for the applicant which will provide a buffer if there are market shocks or an economic downturn. Thus, the development will safeguard employment within the existing business as well as generating additional jobs and will provide a valuable leisure resource for the local community and for visitors. Both from a financial and organisation point of view there are no alternative locations available to the applicant and therefore no alternative sites were considered viable options.

2. Site location & context

2.1 Site location

Cahir town was originally established on the banks of the River Suir in the 13th century and Cahir castle which dates to that period still stands today. Cahir's historical significance is recognised in its designation as one of Bord Failte's (Failte Ireland) Heritage Towns (scheme under the European Regional Development Fund Initiative (1995-1999)) and historic buildings are important part of the historical and cultural landscape. Cahir Castle, which dominates the town centre, Cahir Abbey, Quaker Mills, Dovecote and the Georgian and Victorian streetscape all add significantly to the historic character of the town.

Cahir is located in the lowlands of the Suir river valley. The topography to the east to the town is dominated by land rising steeply along the foothills of the Galtee Mountains which run southwest towards Mitchelstown. The Knockmealdown Mountain range is located approximately 13km to the south (**Figure 2.1**).

Cahir is located on the junction between the M8 Dublin-Cork Motorway and the N24 Limerick-Waterford National route and on the Waterford-Limerick railway line. It is one of the five main settlements in South Tipperary, alongside Clonmel, Carrick on Suir, Tipperary Town and Cashel. The M8 runs north towards Cashel (approx. 14km NNE) and southwest towards Mitchelstown (approx. 26km SW). The N24, located on the northeast corner of the town, runs southeast to Clonmel (approx. 16km SE) and northwest to the village of Bansha (approx. 12km NE) and Tipperary Town (approx. 19km NE). The smaller regional roads of the R639, R640, R670 and R668 traverse the centre of the town.

The proposed development site is located on the edge of Cahir town, just over 1km NNW of the town centre within the Cahir Abbey Industrial Estate. The entrance to the industrial estate (and the proposed development site) is from the Upper Abbey Road. The proposed development is located to the northeast of an industrial unit for which planning has been submitted (planning ref:17600012). Further details on this are included in **Table 2.1**. There are additional industrial units used by the applicant located to the north east of the proposed development. Cahir Abbey Industrial Estate is home to a number of industrial and commercial units including an engineering company, builder's suppliers, a tile store, kitchen showroom, carpet store, a furniture store, a food processing plant, a candle manufacturer and a café. The estate is at or near full occupancy.

The former Roadstone Quarry is located to the east and north/east of the development site. The quarry has been inactive for several years. There is an existing lagoon associated with the former quarry works which is located 100m north of the proposed development site.

On the western side of the industrial estate, residential development extends along both sides of the R640. This residential development is formed by a mixture of period dwellings, small residential estates, and one-off dwellings. To the north of the industrial estate, as the R640 approaches the R639, the landscape becomes more open, begins to rise gradually, and the urban environment gives way to scattered one-off dwellings.

A significant local feature is Cahir Abbey House, a period dwelling lying 190m south of the proposed track. The house and associated outbuildings, including an intervening enclosed garden with 4 m walls, occupies a large site between the industrial estate and the River Suir.

The closest watercourse comprises of a small stream, located 200m west of the proposed development site. This stream flows in southernly direction to meet the River Suir, approximately 550m south of the proposed development site. The River Suir forms part of the Lower River Suir SAC (Site code 002137). Further details of the SAC are included in the AA Screening report (AA screening report - Proposed Karting Facility, Cahir Abbey Industrial Estate, Cahir, Co. Tipperary, DixonBrosnan, 2020) which accompanies this planning application and which is attached as **Appendix 1**.

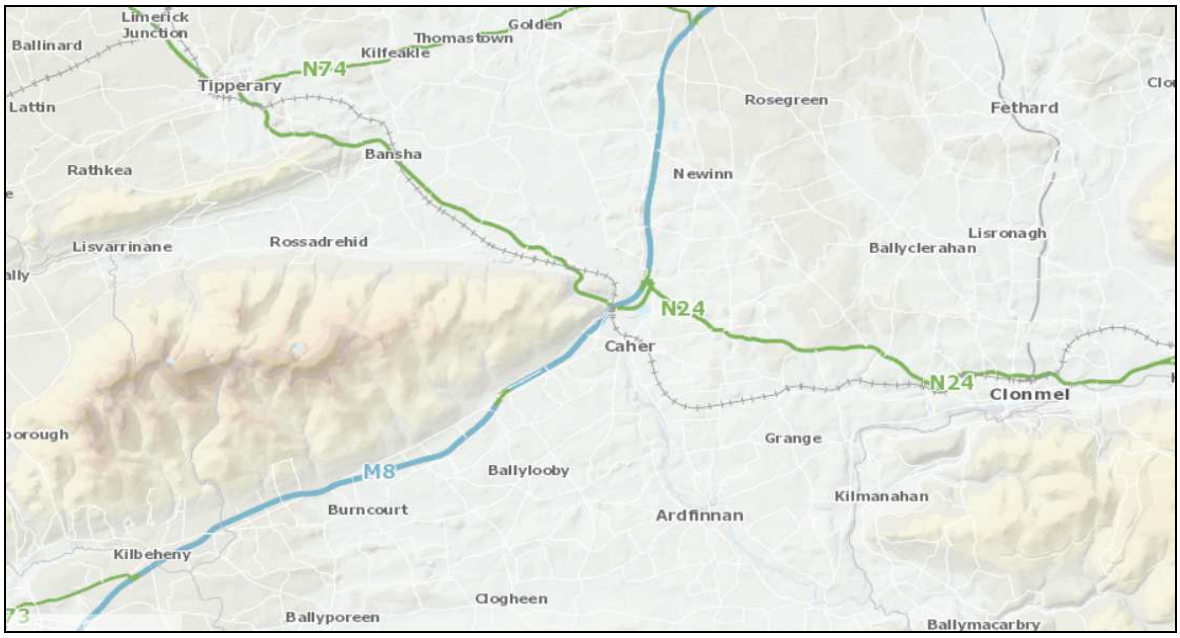


Figure 2.1. Cahir and surrounding landscape

2.2 Landscape

Cahir town is located in the *Urban Fringe* as categorized by *Tipperary Draft Landscape Character Assessment* (2016). Towns represent the largest settlements of the county and due to their size relative to the smaller county settlements, they are considered to have an urban character that sets them apart from the surrounding rural hinterland. The settlements identified above share many very similar characteristics notably their locations on areas of level topography. Many of the towns also have fortified structures and castles. The growth and development of the towns is considered an integral element of the character of the county.

The landscape around Cahir is dominated by two major geographical features; the River Suir and the Galtee Mountains (**Figure 2.2**). The *Tipperary Draft Landscape Character Assessment* (2016) categorises the lands to the north, east and south of Cahir town as 'River Suir Central Plain'. This area is probably better known as the Golden Vale for the rich agricultural grassland which

dominates the landscape. The landscape is characterised by wide rolling vistas with large fertile fields, surrounded by dense hedgerows. This low lying, undulating landscape forms the vast central area of Tipperary county, where it is associated with the River Suir and also extends west along the tributaries of the Multeen, Thonouge and Tar and eastwards along the Anner.

The lands to the west of Cahir form part of the 'Galtee Mountains Mosaic'. This upland area is dominated by moorland, forestry and marginal pasture. It comprises the southern face of the Galtee mountains including an extensive area of cSAC designated land, the Galtee Mountains SAC (See **Appendix 1,** AA Screening report for further details). The area is characterised by steep, forested slopes and glacial valleys rising up from the surrounding plains towards towering peat and moorland covered peaks. Due to the area's limited land capability (shallow, nutrient poor soils), the once typical marginal mountain mosaic of pasture and moorland has largely been replaced by the modern forestry.

Figure 2.2. Aerial view of proposed development site and surrounding landscape.

Due to the topography within the region, extended views are mainly permitted only from higher elevations, largely along the Galtee foothills to the west of the town. Regional routes R670 (N8) extends to the northeast and south of the town, and parts of this route has views which extend several kilometres towards the Galtee Mountains. The proposed development site is only visible from the higher ground to the west of the town, along a minor road, which is included in part of the Tipperary Heritage Way walking trail.

Land use to the south, east and north of Cahir is dominated by intensive agricultural activity, chiefly dairy and cattle with some tillage. The high soil quality is reflected in an absence of scrub, unworked land and commercial forestry. The landscape is criss-crossed by a network of boundary hedgerows, many with mature deciduous trees. While hedgerows have been removed across a number of farms, this activity is not as pronounced as seen in other intensively farmed areas. This contrasts with the land use to the west of the town, which is dominated by commercial forestry, marginal pasture and moorland.

Landscape features of significance are as follows:

- The historic town of Cahir located on a flat plain
- Galtee foothills to the west of the town.
- Historic buildings within the town
- Mature trees within boundary habitats.

2.3 Built environment

The local landscape is urban in character. The proposed development site is located on the north-eastern edge of Cahir town. Cahir, with an approximate population of 3,600, is the only settlement in the immediate study area. The *Cahir Local Area Plan* (2011) divides the town into several zones (**Figure 2.3)**. These include the town centre, existing and new residential areas, an office development area, an integrated tourism venue, light industrial and employment areas as well as general industrial and amenity areas. The proposed development site is located in an area zoned for light industrial and employment use.

A significant local feature is Cahir Abbey House, a period dwelling lying 190m south of the proposed development site. The house and associated outbuildings, including an intervening enclosed garden with 4 m walls, occupies a large site between the industrial estate and the River Suir. The nearest group of dwellings are located on Abbey Street approximately 250m west of the proposed development site. The built environment in the immediate vicinity of the site features several purpose-built industrial units, which are occupied by retail and light industry. A small strip of agricultural grassland is located to the south of the proposed development site, which separates the site from the River Suir, located approximately 290m to the south. Residential areas near the proposed development site can be divided into three district areas.

- The first area, located approximately 250m west of the proposed development site, is centred around Abbey Street. Dwellings here, a mix or modern and historical, are located on either side of Abbey street which runs in an approximately north-south direction. There are also a number of small housing estates to the west of the street; Avondale Close, Abbey Cresent and Woodview.
- The second area is located approximately 1.6km southeast of the proposed development site. Located to the south of the River Suir and the north of the Cahir-Clonmel road (R640), this area is accessed via the R670 and R640 There are several housing estates located in this area including Butler's Court, Hillview, Lake View, Woodland and Dún Uisce. There is also a playground, a leisure centre and a school located in this area.

- The third area is located approximately 1.3km southwest of the proposed development site. This has a small number of residential dwellings has been zoned for future residential development.
- Cahir town centre is located approximately 1km south of the proposed development site. This is based around the primary retail area of Castle Street and the Square. This area contains a mix of services and uses, mainly retail/commercial, residential and recreational.

Table 2.1 lists the planning applications lodged with Tipperary County Council within Cahir Abbey Upper and Cahir Abby Lower over the last 2 years (17/10/2017-17/10/2019). There have been a total of three applications, two of which are extensions to existing dwellings and one which relates to changes to an existing industrial unit (applicant). There have been no applications for new buildings, residential or industrial, in the area during this period.

Table 2.1. Cahir Abbey Planning applications to Tipperary County Council over past 24 months

Planning Ref. Number	Applicant Name	Development Description
19600040	Michael and Celine Kennedy	(i) an existing porch to an existing dwelling as well as Planning Permission (ii) to extend an existing dwelling and all associated site works
17600012	Buttimer Engineering	(i) the demolition of an existing link between 2 no. existing buildings in order to separate buildings and properties so that one building will remain wholly within the site of the planning application along with the making good of the facades on each building, (ii) the change of use of an existing building from a commercial use to an industrial use, (iii) raising the height of a portion of the existing building as described in ii above, (iv) to extend the building described in ii above to include ancillary support space, (v) to extend the building described in ii above to include plant equipment, (vi) the demolition of an existing site store, (vii) the erection of a new industrial unit (viii) the erection of a new site security hut, (ix) the erection of a new office block of which it's use is ancillary to the use of what will be the existing building described in ii above and the proposed building in vii above (x) site works to include new concrete yard around the building

		described in vii above, connection of foul sewer from building described in viii and ix above to an existing on-site pumping station and construction of on-site soakaways for surface water drainage (xi) and all associated signage throughout the development, 3 no. flagpoles and all other site development works and all other development works
19600318	Pauline O'Donnell	construction of a single storey sunroom extension to the front of existing single storey dwelling house

There are a number of commercial/industrial centres in the town. The proposed development site is located within the Caher Abbey Industrial Estate which accommodates a number of industrial and retail units. This is a 35ha site which has been zoned within the Cahir local area plan (LAP) for light industry and bulky goods retail warehousing. A general industrial area is located at the 45ha Kilcommon site and this has been selected as the desired area for heavy/general industry. The Kilcommon site is located approximately 2.5km southwest of the proposed development site. The Carrigeen Business Park (13ha), located approximately 1.1km southwest of the proposed development site has been zoned for light industry. The LAP notes that owing to its location within a reasonable walking distance of the town centre, this is a good location for office-based businesses and small-scale start-up/incubation units.

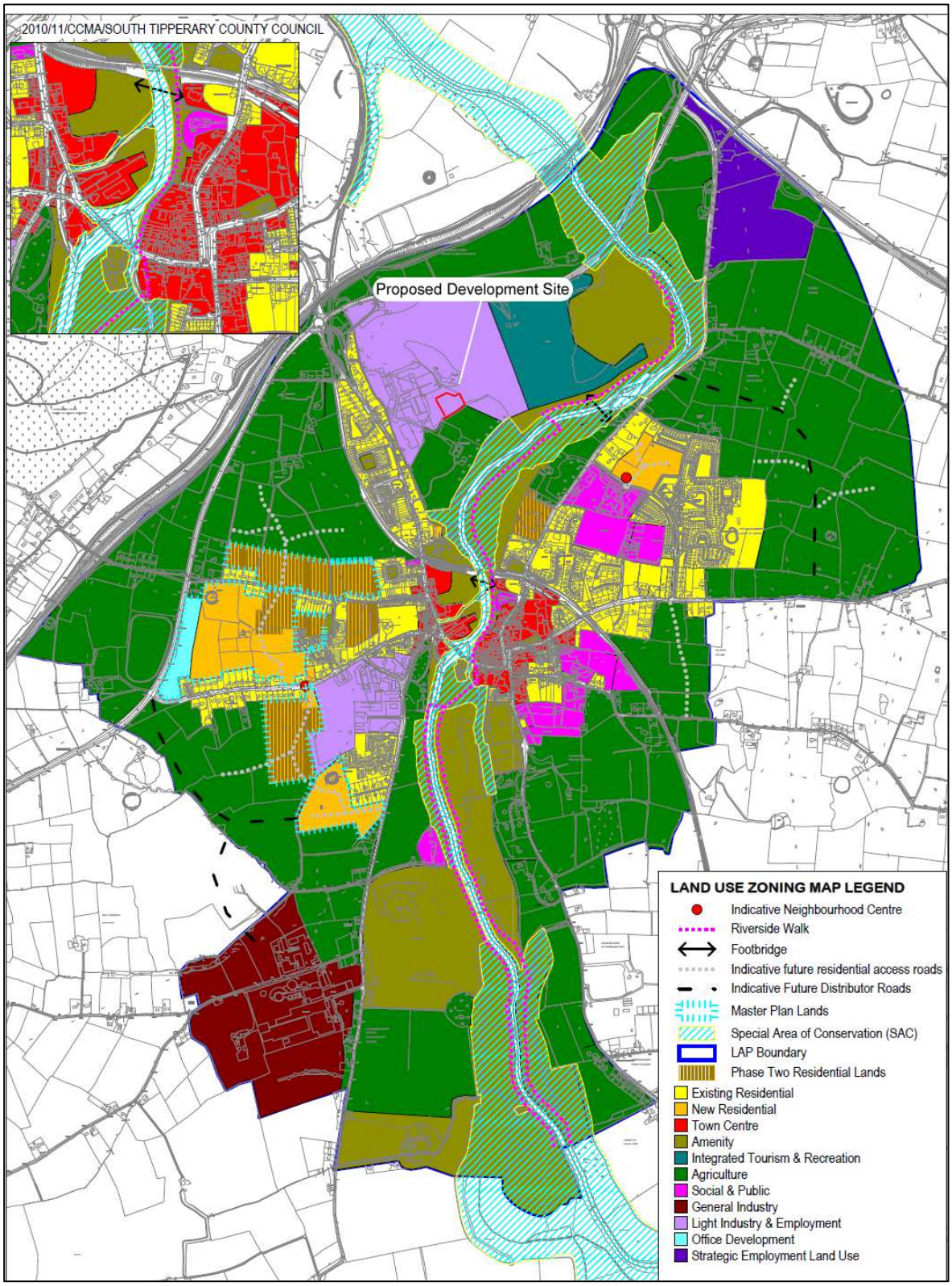


Figure 2.3. Cahir land use zoning map.

The *Cahir Local Area Plan* (2011) notes the following with regard to industry and tourism:

It is a strategic objective of this Local Area Plan to both capitalise on the advantages possessed by Cahir by virtue of its location on the M8 Dublin – Cork National Route, the N24 Waterford – Limerick National Route and on the Waterford – Limerick Railway Line in terms of attracting industry and employment opportunities. In addition this LAP aims to facilitate and guide the development of additional attractions and facilitates to encourage tourists to extend their stay and increase expenditure in the town.

It is noted that the proposed development is in line with these strategic objectives. While there are currently no plans for residential developments in the immediate vicinity of the proposed development site, the *Cahir Local Area Plan* (2011) has set out a number of specific residential development objectives. One of these (HSG1) is at the former Roadstone Quarry, located to the immediate east of the proposed development site. This can be seen in **Figure 2.3** as zoned for 'Integrated Tourism and Recreation'. The objective is to support the development of the Roadstone site for a limited amount of low-density residential development, which would be ancillary to an integrated, tourism, recreational or waterside developments.

2.4 Planning context

Cahir town lies in the Cahir electoral area. It is designated as a secondary service centre in Tipperary County Council's *County Tipperary Local Development Strategy 2014-2020* (2016). Thurles, Roscrea, Tipperary, Carrick on Suir, Templemore, Cahir and Cashel are the main District Service Centres in Tipperary, acting as service centres for their hinterlands and driving development within their catchment areas. This designation aims to strengthen these service centres in their retail, employment and heritage functions and their overall perception as desirable places to live and work. The District Service Centres aim to provide supporting roles to Clonmel (the Major Town in South Tipperary) but, in the context of the settlement strategy, will adopt their own role as service centres offering an improved service provision in terms of retail, employment and community facilities to their own hinterlands.

South Tipperary contains a rich and varied landscape and a wealth of heritage assets that form the basis for the high level of amenity in the county. While the county development plan does not include any specific designations for the proposed development site or any adjacent lands, large parts of Cahir town centre have been designated as an Architectural Conservation Area (ACA). ACA's are places, areas, groups of structures or townscapes, that are of special architectural, historic, archaeological, artistic, cultural, scientific, social or technical character, or that contribute to the appreciation of a protected structure.

3. Description of Proposed Development

3.1 Existing Site Layout

Cahir Abbey Industrial Estate lies on the northern fringes of Cahir town, on the eastern side of regional route R640, approximately 1 km north of the town centre. The R640 meets the R639 300 m north of the industrial estate. The R639 runs parallel to the M8 motorway.

The applicant's site lies at the southeast corner of the industrial estate (**Figure 3.1**). The proposed karting track in turn lies at the southeast corner of the site (**Figure 3.2**).

Figure 3.1. Aerial view of Cahir Abbey Industrial Estate and applicant's site

The proposed development is located within a brownfield site. The area has been cleared and levelled and is covered with hardcore and gravel (**Photograph 3.1**). The area is currently used for general storage and waste from the surrounding industrial estate. With the exception of a planted hedgerow on the southwestern boundary of the site, there is little vegetation with the exception of species characteristic of disturbed ground which have colonised the gravel surface (**Photograph 3.2**).

Photograph 3.1. Proposed development site. Looking south.

Photograph 3.2. Sparse vegetation cover within proposed development site. Looking southeast.

The northern boundary of the applicant's site is formed by an industrial unit within the applicant's land holding (**Photograph 3.2**). The western site boundary adjoins the industrial estate. The southern boundary is formed by an unpaved track which provides access to nearby fields and the disused Roadstone Quarry site. The eastern and north-eastern boundaries adjoin disturbed ground and scrub associated with a neighbouring disused quarry. The site is currently accessed by a gate at the southwest corner.

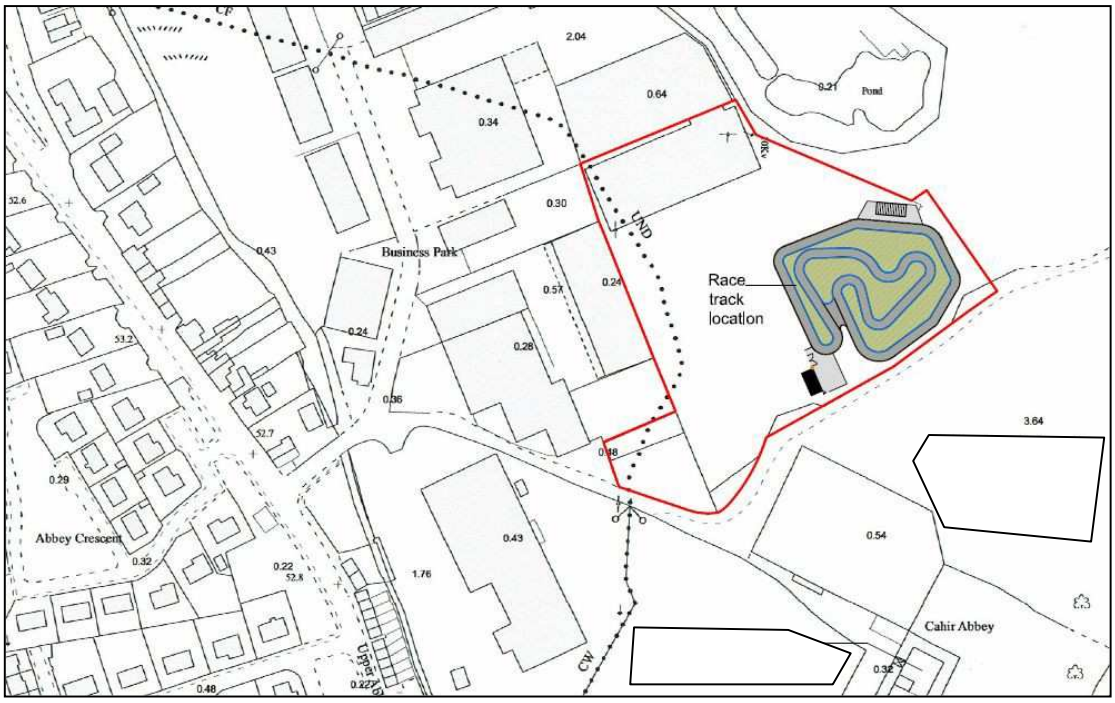


Figure 3.2. Location of proposed development

The local topography is flat. The landscape reflects the site's location on the edge of a town, immediately dominated by the adjacent industrial estate. On the western side of the estate, residential development extends along both sides of the R640. This residential development is formed by a mixture of period dwellings, small residential estates, and one-off dwellings. The development continues south towards the town centre. To the north of the industrial estate, as the R640 approaches the R639, the landscape becomes more open and begins to rise gradually, and the urban environment gives way to scattered one-off dwellings. To the east and northeast of the site, the landscape is dominated by a closed sand and gravel quarry.

The northern boundary of the site adjoins an existing industrial unit, which is the holding of Buttimer Engineering, the applicant for the karting track (**Photograph 3.3**). This warehouse is currently not in use, but there are plans to use this as a working area for the company. There is planning permission (Ref 17600012) to change the use of this warehouse from commercial to industrial and also to extend the building to the front and raise is roof. There will also be new concrete yards to the east and west of the main entrance.

Photograph 3.3. Looking north and west.

Photograph 3.4. Green area with mature oak trees close to southern boundary.

There is a wide paved roadway which accesses this industrial unit from the south. This roadway will run along the western boundary of the proposed karting track. The southern boundary has a planted treeline and a weldmesh fence (**Photograph 3.3**). The access road for the former Roadstone Quarry runs parallel to this and adjoins a small green area with mature oak trees (**Photograph 3.4**). An old stone wall, which forms the northern boundary of Cahir Abbey House is located just beyond this roadway.

The east of the proposed development site is bounded by a concrete wall (approx. 1.8m) topped with a weldmesh fence. A small number of buddleja plants which is considered an invasive species have become established along this boundary (**Photograph 3.5**). The eastern boundary runs adjacent to the former Roadstone Quarry. Activity at this site ceased several years ago. The site now houses a large lake as well as areas of scrub and trees. As mentioned in **section 2.3**, Cahir LAP has designated this as an *integrated tourism and recreation* zone. There are hopes that this site would be developed as a water-based recreation area. This lake development would be connected to the town centre and all its amenities, the Golf Course and the Swiss Cottage by way of footbridges and a riverside walk.

Photograph 3.5. North eastern boundary of site. Looking south.

3.2 Proposed Development

3.2.1 Proposed Development Overview

Permission has been sought for a karting track development at Cahir Abbey Industrial Estate, Cahir, Co. Tipperary. The proposed development will comprise the following;

1) a building comprising changing rooms and a W.C.

2) a building for the storing of and general maintenance of the karts

3) the installation of an over ground gas storage tank for the refuelling of the karts

4) perimeter fencing

5) general signage on the building described in item 1 above

6) general signage on the perimeter fencing

7) the change of use of the land from industrial to a karting track

8) hardstanding of the proposed areas for karting track

9) general lighting

10) and all other site development works

It is proposed to install an outdoor karting track at the southeast corner of the site (**Figure 2.2**). The track will consist of a tarmac area at the centre of the proposed development site. While the shape of the hardstanding area in **Figure 3.3** will remain constant, the layout shown will change weekly to give varying degrees of complexity for users. Although operating times of 1200-2200 h Monday-Sunday are proposed, including public holidays, it is likely that the track will be idle for much of the time. The peak time of activity is expected to be Saturday 1200-1800 h, and during these hours the track is likely to be in use almost continuously apart from initiation periods at the start of each race. Driving school sessions, which would have up five attendees at each session, will also be provided.

The karts will use four-stroke gas-powered internal combustion engine karts provided by a supplier such as Sodikart (**Photograph 6.3**), with a likely engine capacity of 270 cc. The track will be restricted to a maximum of 10 karts at any time. Maintenance activities undertaken within a proposed workshop near the northeast corner.

Construction is expected to take four months, beginning in March and completing in June 2020.

No new car parking spaces will be required. An existing car park, owned by the applicant, at the south west corner of the proposed development site will be used for visitors and staff.

An acoustic barrier will be erected at the southwest corner in front of the existing weldmesh fence (**see Figure 3.3**). This Woodfab acoustic barrier will consist of a solid absorptive proprietary screen of height 2 m and posts of 3 m. Absorptive barriers are designed to insulate against noise and absorb sound that strike them. Through laboratory testing a performance coefficient of A4 (high coefficient) has been assigned to this barrier. The barrier will provide acoustic screening with respect to the kart collection area, and the southern segments of the track. Further details of this are included in **Chapter 4 Noise and Vibration**.

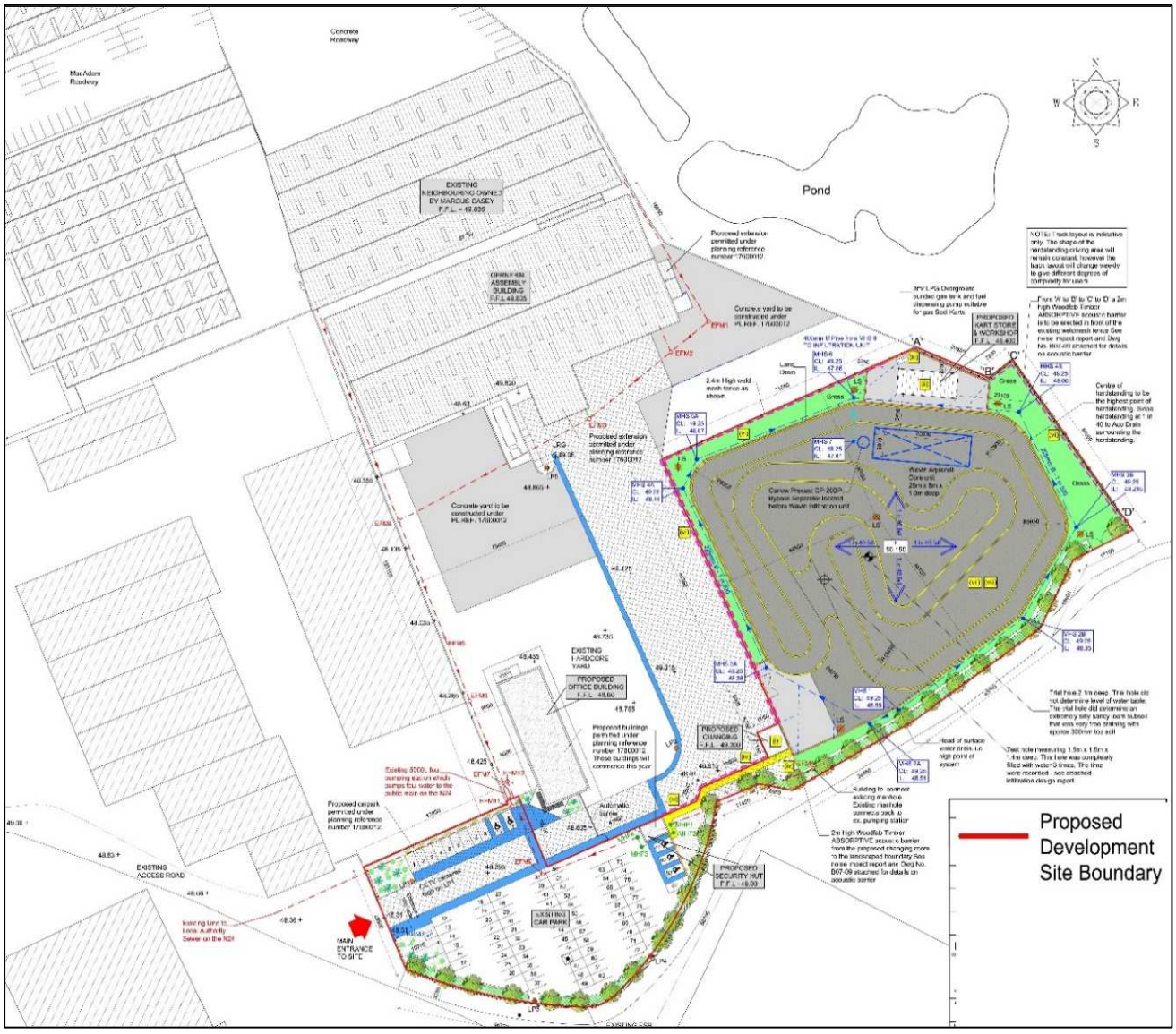


Figure 3.3. Site layout

Two new buildings will be constructed, a changing room and toilet area located at the southwestern corner of the site and a workshop area located at the northeast corner. These will be steel cladded buildings. The site will be accessed via an existing road and footpath located at the southwest of the proposed development site.

A total of six 62-watt LED lanterns will be situated on the perimeter and centre of the karting track. These will be mounted on 6m galvanised steel steeped tubular routed columns. These will be IP66 rated lanterns with zero upward light output. An illuminance study carried out carried out by Carrabridge Lighting and Controls is included in **Appendix 4** of this report. General signage will be located on the perimeter fencing. This will be single sided to the bottom of the fencing. Signage will be continuous; 288m long x 0.6m high.

The track with the bounded on all sides by a grassy verge. Clusters of rowen, hawthorn and common cherry have b planted along the south eastern boundary of the site as specified in a previously granted planning application (ref. number 17600012). These trees are underplanted with laurel and holly to form a dense thick screen. Underplanting here is 2.5 m thick and 1.5 m high. Under planting should reach a height of 2.5-3.5 m within three years of planting. These trees are required to be maintained indefinitely and replaced if failure occurs.

3.2.2 Foul Water

Effluent from the proposed development will be connected to the existing sewer network and conveyed to Cahir WWTP for treatment prior to discharging to the River Suir. Treated wastewater from the proposed development site will ultimately be discharged to the River Suir via the Primary Discharge Point for the Cahir Agglomeration. The most recent Annual Environmental Report (2017) available for the Cahir WWTP notes that "*discharge from the wastewater treatment plant does not have an observable negative impact on the water quality*".

3.2.3 Surface Water

As part of the proposed development a surface water drainage scheme has been designed in accordance with SuDs principles. It is proposed to install an Aco Channel (i.e. a high-attenuation slot drain) around the perimeter of the hardstanding. The hardstanding includes tarmac areas, concrete areas, and the roofs of the proposed buildings. The hardstanding will slope from its centre to the Aco drain at a slope of 1 in 40. In order to achieve this the centre of the track will be 900mm higher than the perimeter. The centre of the hardstanding will be at a level of 50.150 and the Aco Drain will be at a constant level of 49.250. The total hard/standing areas, including rooftops, will be 6,150m^2.

The Aco channel will be 150mm wide and 150mm deep and will have outlets to the main 225mm Ø Wavin uPVC sewer laid adjacent to the Aco drain at 10m C/C. The channel itself will be laid level. It is the 225mm Ø sewer that will be laid to a fall of 1 in 200. This system will drain a total of 6150m^2 of hardstanding area.

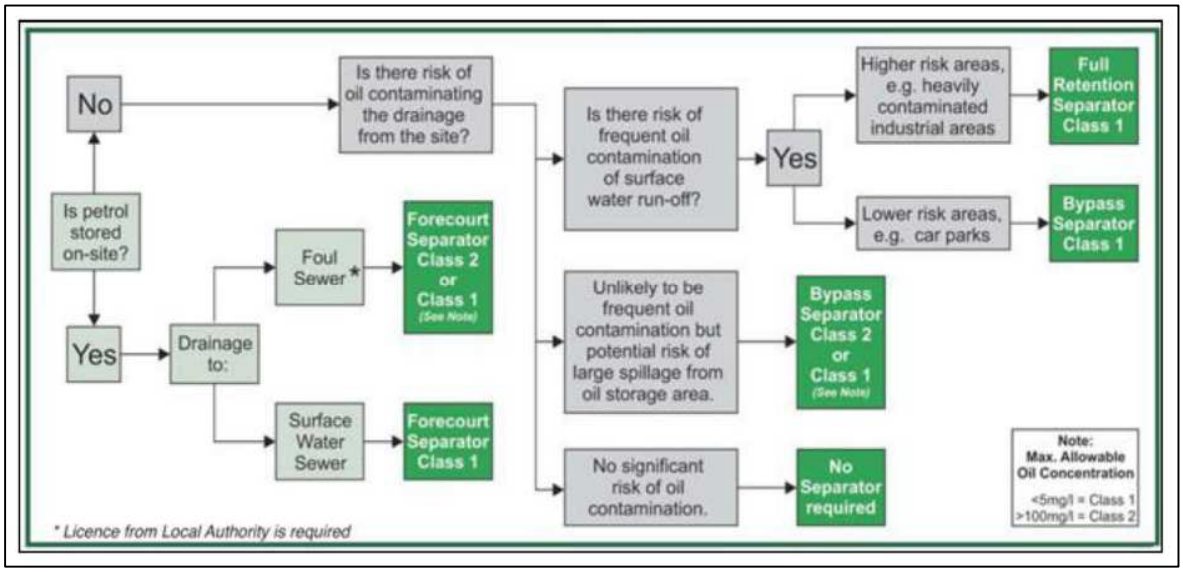


Figure 3.4. Flow chart for Carlow Tank Separator

The 225mm surface water sewer will discharge to a Carlow Concrete CP20BP (Class 1 & 2 to EN858) Bypass Separator (**Figure 3.4**). The Bypass Separator is capable of draining 11,500m² of hardstanding, will store up to 1360 litres of oil and will allow a storm flow of 200 litres per second – all of which is far in excess of what this situation requires. It must be noted that this separator is designed and selected in accordance with EN858.

From the Bypass Separator the surface water discharges to a Wavin Aquacell Core system measuring 25m long x 8m wide x 1.0m deep. The AquaCell unit is wrapped in a geotextile fabric that allows water to infiltrate and does not allow silt to get in. The system has been designed in accordance with both BRE Digest 365 & manual of good practice (R156) as published by CIRIA (construction industry research and information association). Ultimately surface water will percolate to ground water.

4. Noise & vibration

4.1 Introduction

Damian Brosnan Acoustics was instructed by Howick O'Brien Consulting Engineers, on behalf of their client Buttimer Engineering, to carry out an assessment of potential noise impacts associated with a proposed karting facility at Cahir Abbey Industrial Estate, Cahir, Co. Tipperary. The objectives of the assessment were as follows:

- To identify standards and criteria relevant to the proposed development.
- To identify noise sensitive receptors.
- To describe the existing noise environment by reference to measured noise data.
- To identify noise sources associated with the development.
- To quantify the likely noise output from the site.
- To calculate noise levels arising at offsite receptors.
- To determine impacts at receptors by reference to identified criteria.
- To identify mitigation requirements.

The original version of this noise report (dBA report 141.1.1 dated 05.09.17) was included in planning application 18600140 submitted to Tipperary County Council. To enable further consideration of the application, the local authority sought additional information by letter dated 29.03.18. The request for further information (RFI) included the following:

> *Item 4*
>
> *Please arrange to submit, for the consideration of the Planning Authority, an updated Noise Impact Assessment that examines the impact of noise on the lands zoned for Integrated Tourism & Recreation. In this regard the Planning Authority is concerned with the potential for noise to negatively impact on the development potential of these lands.*

The noise impact assessment has been revised to address the above request. The requested revision is addressed in **section 4.7**.

The Environmental Protection Agency (EPA) documents Advice notes on current practice in the preparation of environmental impact statements (draft, 2015) and Guidelines on the information to be contained in environmental impact assessment reports (draft, 2017) were consulted during the preparation of this report. A glossary of noise terms is provided at the end of the report.

The proposed development is highly unlikely to give rise to ground borne vibration. Vibration is therefore not considered further.

4.2 Noise criteria

There are no noise standards or guidance documents specifically applicable to karting noise. Thus there are no specific karting noise criteria available. In the absence of any specific criteria, noise criteria were discussed with the local authority's Environment Officer by telephone call on 28.06.17, prior to undertaking this assessment. The officer recommended that a daytime limit of 55 dB be applied, reducing to 45 dB during evening and night-time hours. In line with guidance given in EPA document NG4 Guidance note for noise: Licence applications, surveys and assessments in relation to scheduled activities (2016), it is considered that 'evening' commences at 1900 h. In this assessment, these limits are applied to offsite noise sensitive locations (NSLs), in keeping with EPA guidance.

In addition to the above limits, the officer requested that predicted noise levels should be assessed by comparison with existing ambient noise levels at NSLs.

4.3 Study site

Cahir Abbey Industrial Estate lies on the northern fringes of Cahir town, on the eastern side of regional route R640, approximately 1 km north of the town centre. The R640 meets the R639 300 m north of the industrial estate. The R639 runs parallel to the M8 motorway. The applicant's site lies at the southeast corner of the industrial estate (figure 1). The proposed karting track in turn lies at the southeast corner of the site (**Figure 4.2**).

Figure 4.1. Study site.

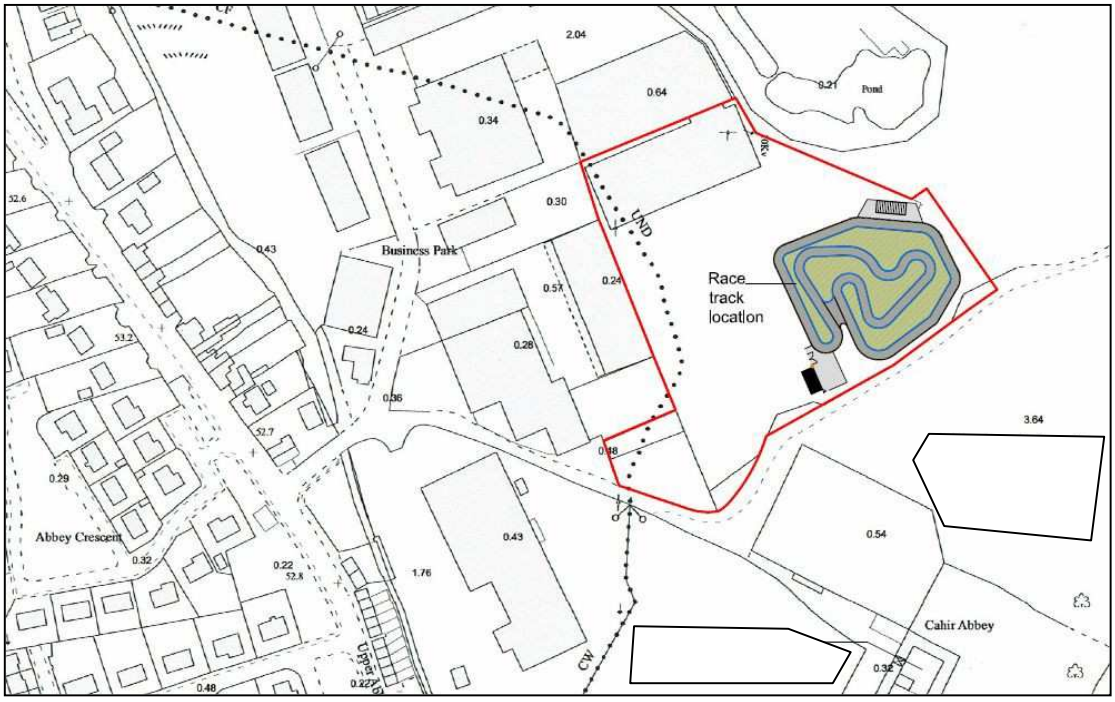


Figure 4.2: Proposed karting track location.

The site of the proposed track currently consists of cleared level ground at the southeast corner of the holding. Thus the northern and western sides of the proposed track adjoin existing open areas within the site. The eastern and southern sides directly adjoin the site boundary.

The northern boundary of the applicant's site is formed by an industrial unit within the holding. The western site boundary adjoins the industrial estate, and part of the boundary directly abuts an industrial unit. The southern boundary is formed by an unpaved track which provides access to nearby fields. The eastern and northeastern boundaries adjoin disturbed ground and scrub associated with a neighbouring quarry. The site is currently accessed by a gate at the southwest corner.

The local topography is flat. The landscape reflects the site's location on the edge of a town. The landscape is immediately dominated by the adjacent industrial estate. On the western side of the estate, residential development extends along both sides of the R640. This residential development is formed by a mixture of period dwellings, small residential estates, and one-off dwellings. The development continues south towards the town centre. To the north of the industrial estate, as the R640 approaches the R639, the landscape becomes more open and begins to rise gradually, and the urban environment gives way to scattered one-off dwellings. To the east and northeast of the site, the landscape is dominated by a closed sand and gravel quarry.

A significant local feature is Cahir Abbey House, a period dwelling lying 190m south of the proposed track. The house and associated outbuildings, including an intervening enclosed garden with 4 m walls, occupies a large site between the industrial estate and the River Suir. The dwelling constitutes the nearest NSL. The next closest NSLs are those located along the R640, where a number of dwellings lie 280-300 m from the proposed track. The number of dwellings within 500 m exceeds 150, with the majority of these lying along or close to the R640 to the west and southwest of the site. None of these is afforded views of the site due to screening provided by existing buildings at the industrial estate. The site is likely to be visible from several upper floor windows at Cahir Abbey House, although this view is likely to decrease over time as intervening trees mature. A number of houses on the hillside 1 km to the northwest are afforded views over the study site.

Apart from the NSLs identified above, no other sensitive receptors have been noted within 500 m of the site. No particularly vulnerable receptors such as nursing homes are located in proximity to the study site.

A noise impact assessment requires a brief review of the 'do nothing' scenario i.e. the likely progression of the soundscape in the absence of the proposed development. Should the proposed development not proceed, the local soundscape is unlikely to change significantly in the short and medium term. In the long term, it is possible that development of the landbank to the north and east of Cahir Abbey Industrial Estate, and the landbank to the southeast across the river, may result in the introduction of new noise sources such as industrial/commercial activities, and increased traffic associated with residential development. The applicant’s site itself is likely to be developed at some point in the future if the karting track does not proceed.

4.4 Existing soundscape

The local noise environment is dominated by road traffic noise, arising from several locations:

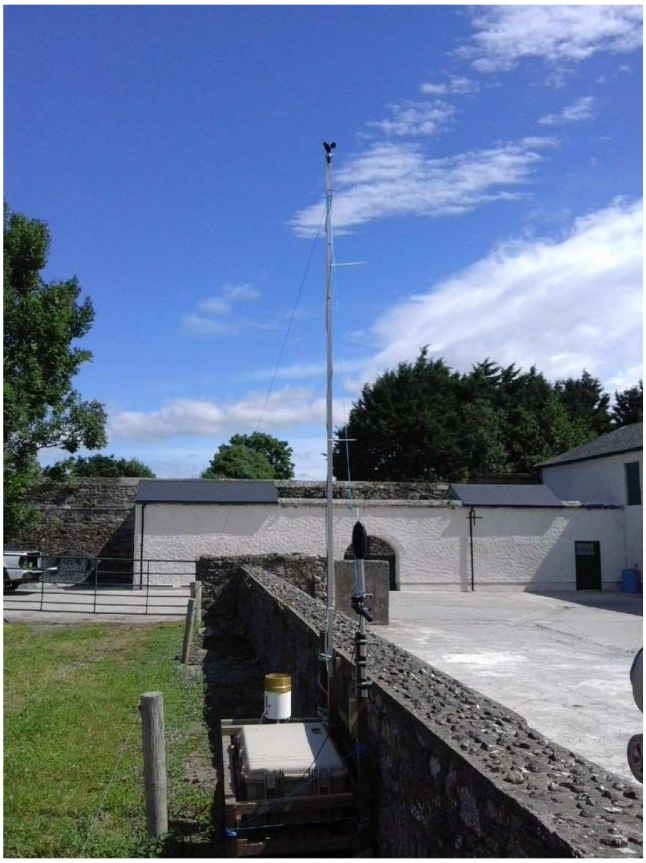
- R640 traffic, present intermittently throughout the day and evening, reducing to sporadic at night.
- Distant traffic across Cahir town, including R670 traffic to the southeast.
- Local traffic throughout Cahir Abbey Industrial Estate, confined chiefly to daytime hours, although some truck activity may arise during evening and night-time hours.
- M8 motorway traffic, audible almost continuously on a 24 h basis, with audibility varying from slight to clear depending on wind direction. Scattered traffic also occurs on the parallel R639 route.

Site inspections indicate that there are no other noise sources of major significance. While emissions associated with commercial activities at the industrial estate may be significant in proximity, these are unlikely to be significant beyond 100 m. A nearby sand and gravel pit is closed.

In order to quantify the ambient noise environment, noise monitoring was carried out in the vicinity of Cahir Abbey House, the nearest NSL to the site. An unattended noise monitoring terminal was set up at station N1 shown in **Figure 4.3** and **Photograph 4.1**. Noise data, rainfall and wind speed

were logged continuously over the period 30.06.17—07.06.17. Survey methodology, equipment specifications and weather conditions are listed in **Appendices 4.1 and 4.2**. Recorded noise data are presented in **Appendix 4.3**. The time history profile and distribution of LAF90 15 min values is shown in **Appendix 4.4**. From **Appendix 4.5**, daytime and evening background levels are considered to be 42 and 41 dB respectively. The narrow range is most likely the result of M8 traffic.

Figure 4.3: Noise monitoring stations.



Photograph 4.1: Noise station N1 near outbuildings at Cahir Abbey House. Photograph looking N.

The soundscape at N1 was dominated by distant traffic across the town and on the R640 throughout daytime and evening hours. M8 traffic noise was continuously audible at all times. Extraneous sources included bird song/calls and rustling trees. Daytime activities at the industrial estate were occasionally audible at a low level. It is considered that measured data are likely to be reasonably representative of typical average noise levels prevailing at N1.

Attended monitoring was undertaken Thursday 06.07.17 at station N2, shown in **Figure 4.3** and **Photograph 4.2**, in order to provide additional information regarding the soundscape closer to the R640. The position used provides an indication of ambient noise levels at dwellings along the R640, particularly at the rear facades of dwellings facing the study site. Survey details are presented in **Appendix 4.1**. Recorded data are presented in **Appendix 4.3**, and the profile shown in **Appendix 4.4**.

Photograph 4.2: Noise station N2, showing rear facades of dwellings facing study site. Photograph looking S.

The soundscape at N2 was dominated by intermittent R640 traffic, with M8 traffic continuously clearly audible. There were no emissions audible from the industrial estate during the survey apart from louder vehicle movements. Other sources audible included playing children, dog barking, bird song/calls and lightly rustling trees, all of which gradually reduced through the evening, allowing M8 traffic to become more prominent. Daytime LAeq 15 min levels were 52-61 dB, falling to 50-54 dB during the evening. Corresponding LAF90 15 min levels were 43-52 and 39-47 dB.

LAeq 15 min levels were generally 4-7 dB higher at N2 than at N1 throughout the measured daytime and evening periods. LAF90 15 min levels were 1-2 dB higher during the daytime. During the evening, LAF90 15 min levels at N2 were 0-2 dB lower than at N1. This may be due to reduced tree rustling at N2 (although wind speeds were particularly low during the N2 survey). It is also possible that the intervening terrain provides greater attenuation of M8 traffic at N2.

4.5 Proposed noise sources

It is proposed to install an outdoor karting track at the southeast corner of the site (**Figure 4.2** and **Figure 4.4**). Track configuration will be modifiable through the use of mobile barriers. Up to 10 karts will use the track simultaneously. Although operating times of 1200-2200h Monday-Sunday are proposed, including public holidays, it is likely that the track will be idle for much of the time. The peak time of activity is expected to be Saturday 1200-1800h, and during these hours the track is likely to be in use almost continuously apart from initiation periods at the start of each race.

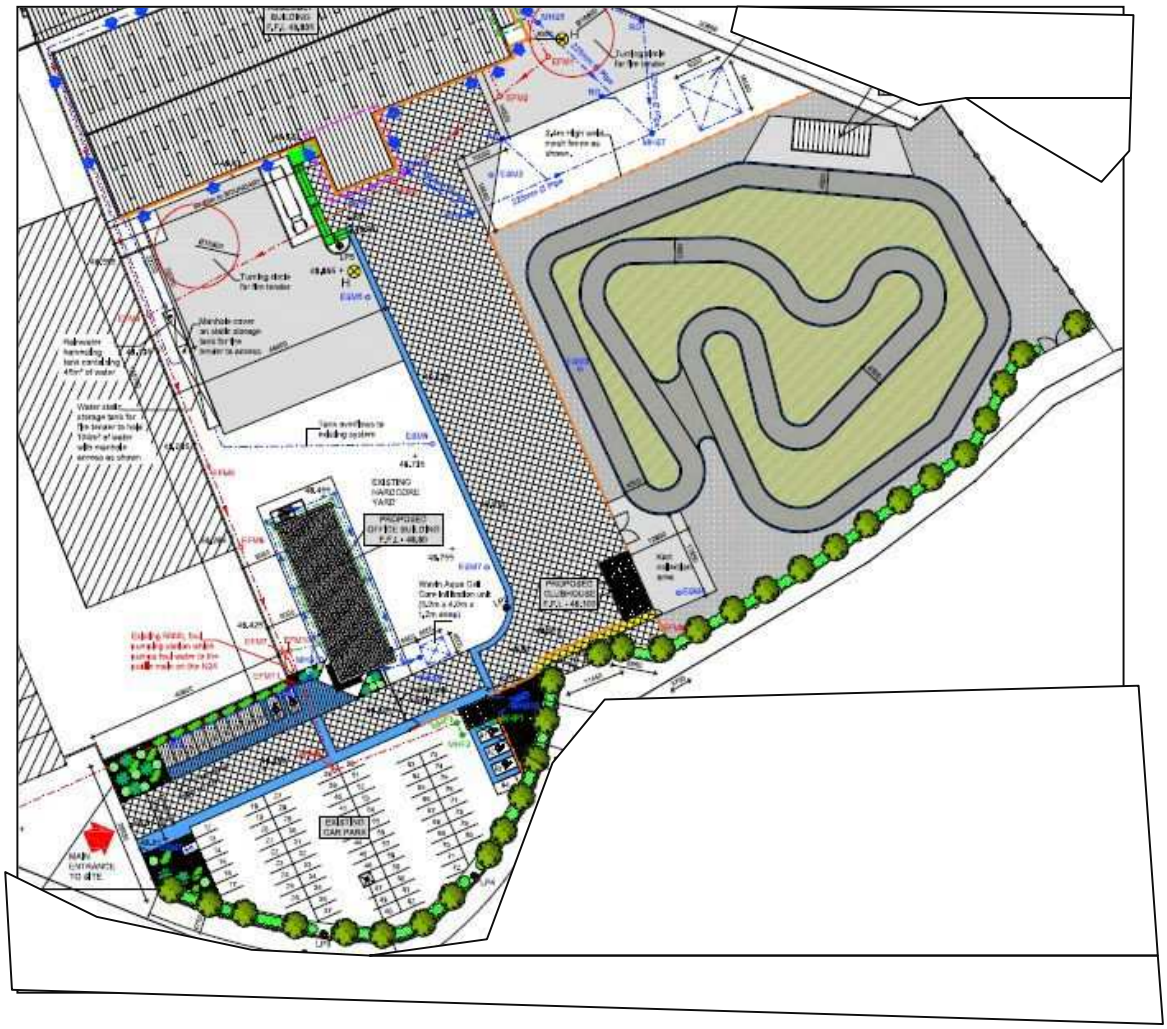


Figure 4.4: Proposed site layout.

Noise sources expected onsite are as follows:

- The karts themselves. It is proposed to use four-stroke gas-powered internal combustion engine karts provided by a supplier such as Sodikart (see example shown in **Photograph 4.3**), with a likely engine capacity of 270 cc. The track will be restricted to a maximum of 10 karts at any time.
- Maintenance activities undertaken within a proposed workshop near the northeast corner. Emissions here are unlikely to be elevated and will be confined internally.
- Vehicle movements associated with facility visitors. Such emissions are unlikely to be significant in the context of existing vehicle movements across the surrounding industrial estate, and traffic using the R640 and M8 routes.

No noise sources other than the above are expected. From the foregoing, it is evident that the chief noise source will be the karts themselves. Emissions from all other sources will be negligible in the context of (a) karting emissions and (b) the existing soundscape. User facilities will be

provided initially in porta-cabin structures, to be replaced with more permanent facilities in due course. Noise emissions from the construction phase will be negligible at NSLs in the context of the existing soundscape, with the chief noise source being asphalt laying.

Photograph 4.3: Sodikart gas-powered 270 cc kart.

Noise emissions from a gas-powered Sodikart, similar to that proposed, were measured at the Midland Karting facility at Cranleymore, Edgeworthstown, Co. Longford on 11.08.17. Levels were measured directly by Damian Brosnan Acoustics using the Type 2250 sound level meter described in **Appendix 4.1**. Test results are shown in **Figure 4.5**. The measured kart was operating near maximum engine speed during the test, approaching 5000 RPM. Calculations indicate that distance attenuation approximately follows an inverse square law based on 20log[d], as confirmed by several additional spot readings.

Typical third octave band frequency spectra are shown in **Figure 4.6**. The spectrum recorded at position D in **Figure 4.5** indicates the presence of acoustic energy in the 50 and 100 Hz bands. The energy is not tonal when assessed using annex D of International Standard ISO 1996-2:2007 Acoustics – Description, measurement and assessment of environmental noise, Part 2: Determination of environmental noise levels (2007). Track drive-by tests show energy in the 25 and 50 Hz bands at positions E and F, with these signals being tonal at position E. Importantly, all three signals (25, 50 and 100 Hz) fade with increasing distance, and spot tests indicate that kart emissions are not tonal beyond 50 m. This phenomenon appears to be a function of kart direction and is possibly linked to ground interference effects.

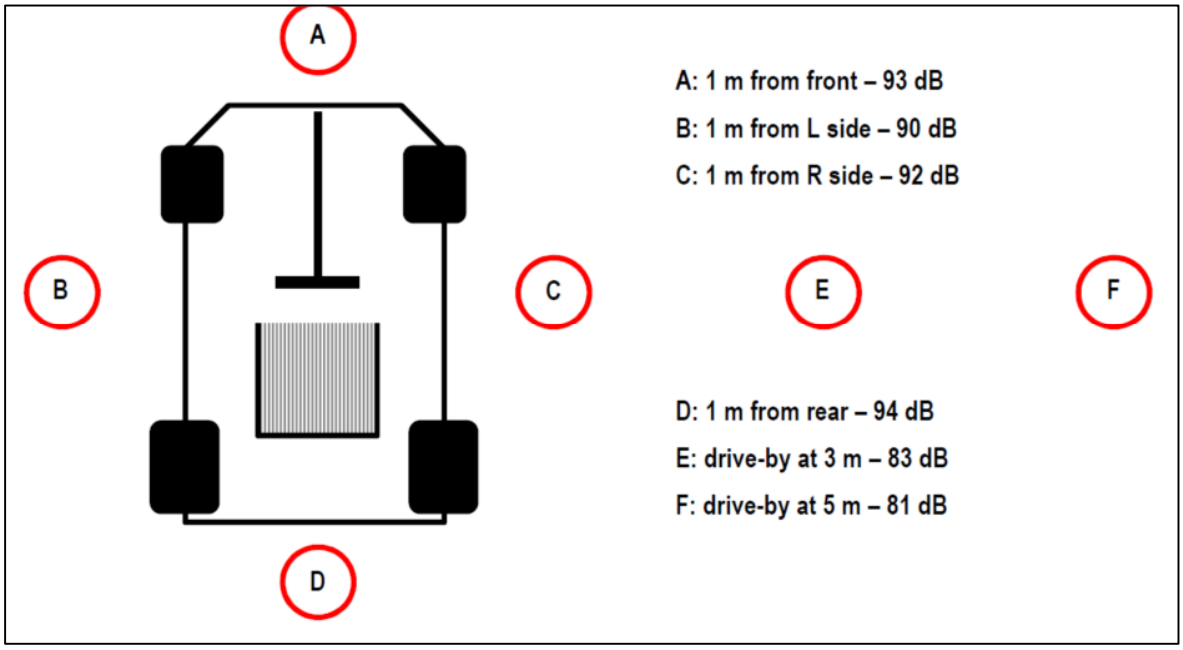


Figure 4.5: Kart sound pressure levels (LAeq 1 s) (not to scale).

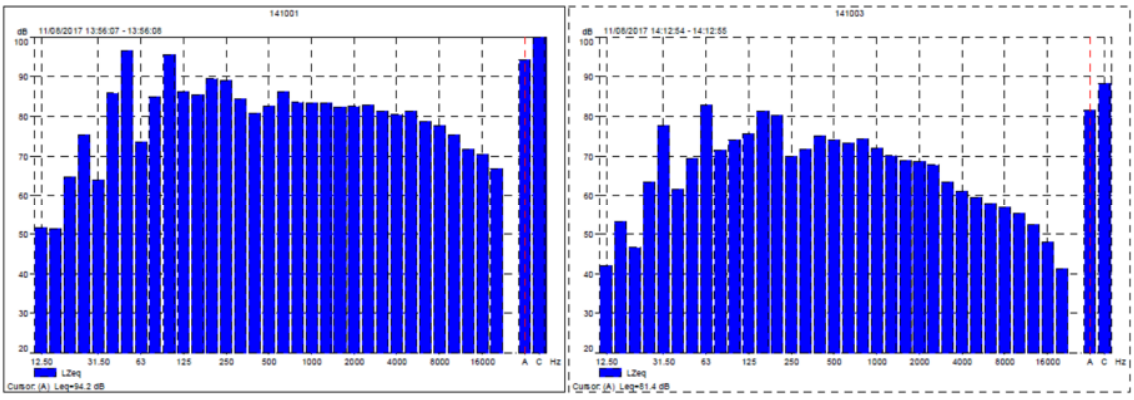


Figure 4.6: Third octave band spectra recorded at position D (left) and position F (right).

It should be noted that the kart measured at the Midland Karting facility was several years old. Noise data presented above are therefore likely to be marginally higher than levels arising from a new kart. The data presented are used below in order to adopt a worst-case scenario.

4.6 Noise impacts

Kart sound pressure levels at the nearest representative receptors are modelled in appendix 6 using International Standard ISO 9613-2:1996 Acoustics: Attenuation of sound during propagation outdoors, Part 2 General method of calculation (1996) methodology. The model assumes that 10 karts will be raced simultaneously. In order to apply a reasonable worst-case

scenario, the model assumes that the karts will be spread around the track. ISO 9613 assumes that all receptors are downwind of the source.

Table 4.1: Predicted Noise Levels (as dB)

Receptor	Pre-mitigation LAeq T	Post mitigation LAeq T	Existing daytime		Existing evening	
			Ambient LAeq 15 min	Residual LAF90 15 min	Ambient LAeq 15 min	Residual LAF90 15 min
Cahir Abbey House – rear garden	42	42	47	42	46	41
Cahir Abbey House – ground floor	42	42	47	42	46	41
Cahir Abbey House – upper floor	43	43	47	42	46	41
Period dwelling to SE	42	42	47	42	46	41
Dwellings along R670 to ESE	39	39	-	-	-	-
Dwellings along R640 to SW	46	44	52-61	43-52	50-54	39-47
3 storey dwellings to W – rear garden	33	33	52-61	43-52	50-54	39-47
3 storey dwellings to W – top floor	34	34	52-61	43-52	50-54	39-47
Dwellings along R640 to W	33	33	52-61	43-52	50-54	39-47
Cluster of dwellings NW on cul de sac	30	30	52-61	43-52	50-54	39-47
Dwelling 500 m NW	31	31	-	-	-	-

Predicted levels are presented in **Table 4.1**. Receiver locations are shown in **Appendix 4.6**. Prediction was initially undertaken without any mitigation options included. The highest pre-mitigation noise level is 46 dB, predicted at dwellings along the R640, immediately north of the main entrance to Cahir Abbey House. These dwellings do not benefit from any screening. Levels at Cahir Abbey House itself are 42-43 dB.

Following discussions with the applicant, it has been agreed that the proposed development will benefit from inclusion of acoustic screening, namely an acoustic barrier at the southwest corner, as shown in **Figure 4.7**. The barrier will consist of a solid reflective proprietary screen of height 2 m such as a Holgate Fencing motorway panel. The barrier will provide acoustic screening with respect to the kart collection area, and the southern segments of the track. This screening will in particular benefit R640 dwellings immediately north of the Cahir Abbey House main entrance, reducing predicted levels to 44 dB.

From the foregoing, noise levels at all receptors will be significantly lower than the 55 dB daytime limit identified in **Section 4.2**. Levels will also be less than the 45 dB criterion identified with respect to evening hours.

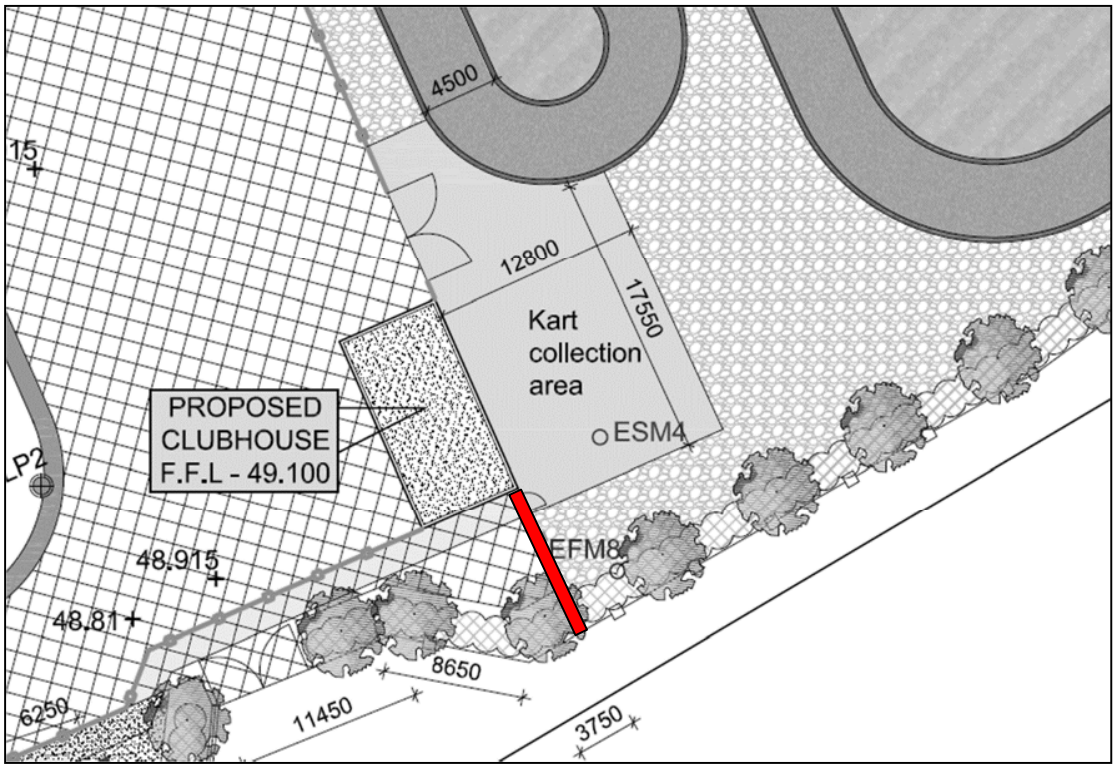


Figure 4.7: Proposed location of acoustic barrier shown in red.

Table 4.1 above includes a comparison of predicted levels with existing ambient and residual noise levels. For the purpose of the comparison, noise data recorded at N1 are considered reasonably applicable to a period dwelling to the southeast. Levels recorded at N2 are considered representative of dwellings along the R640. Predicted levels are in all cases less than ambient noise levels, and generally less than residual noise levels. Where residual levels are exceeded, the difference is marginal at most.

4.7 RFI response

The local authority's RFI dated 29.03.18 requires that this report be revised to include an assessment of potential noise impacts on lands zoned 'integrated tourism and recreation' in the authority's development plan. The land bank in question is shown in **Figure 4.8**. The proposed development site lies 250 m from the zoning boundary.

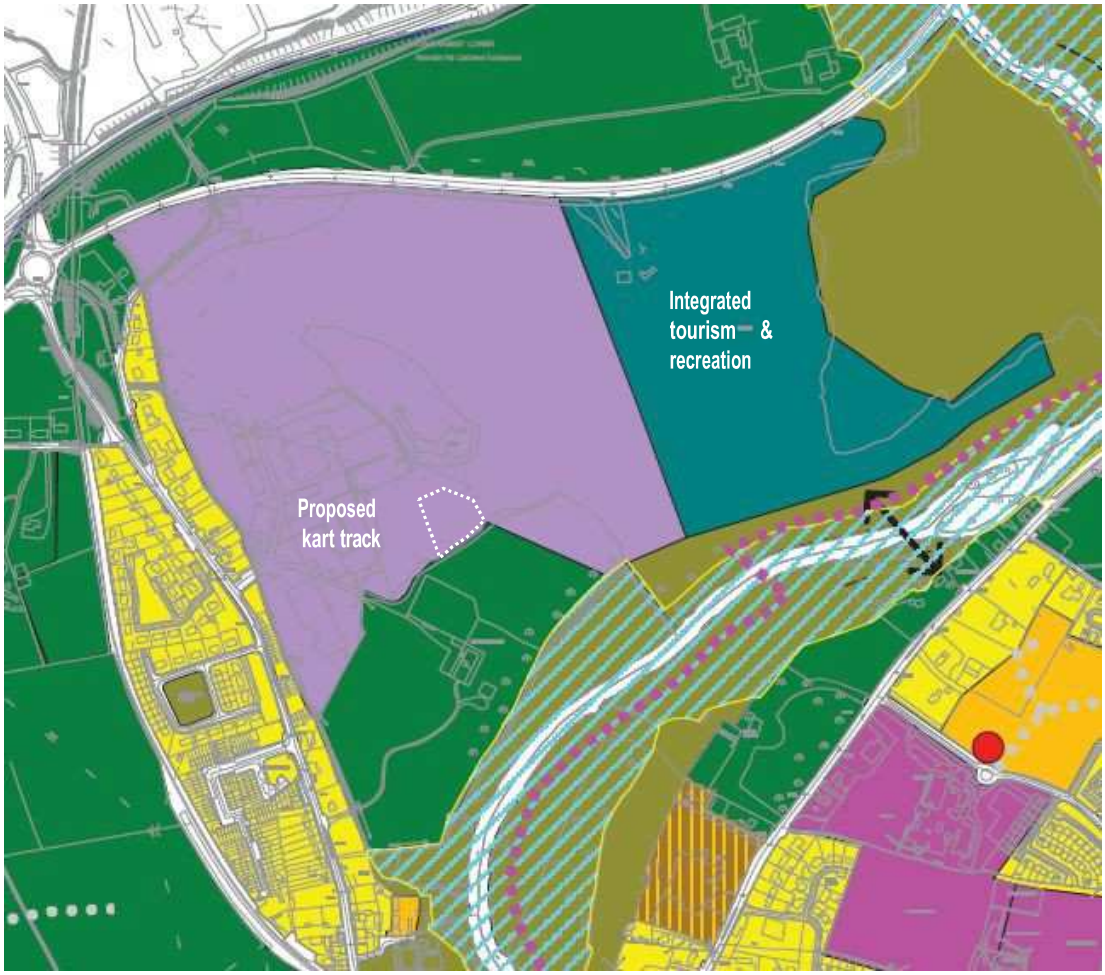


Figure 4.8: Integrated tourism and recreation zoning in South Tipperary County Council Development Plan.

Lands zoned for tourism or recreational use do not benefit from specific noise guidelines or criteria. Moreover, the NSL definition included in EPA document NG4 Guidance note for noise: Licence applications, surveys and assessments in relation to scheduled activities (2016) does not include any reference to zoned lands. In the absence of any specific guidance, the most practical approach here is to extend the criteria discussed in section 2 to the zoned area, namely a daytime limit of 55 dB, and a 45 dB limit after 1900 h. In addition, predicted levels may be assessed by reference to ambient levels in the zoned area.

Existing ambient noise levels were measured during a survey carried out Sunday 16.12.18. Attended monitoring was undertaken at a station near the northwest corner of the zoned area, designated N3 and shown in **Figure 4.9** and **Photograph 4.4** (it was not possible to gain access to the zoned area). Survey methodology, equipment specifications and weather conditions are listed in **Appendix 4.7**. Recorded noise data are presented in **Appendix 4.8**. Daytime and evening LAF90 15 min levels are in the order of 46 and 43 dB at the measurement position. Levels

deeper in the zoned area are calculated on the basis that M8 traffic noise dominates the study site, assuming line source attenuation of traffic noise with distance.

Figure 4.9: Noise station at zoned area.

Photograph 4.4: Noise station N3, looking S.

The model described in **section 4.6** was extended to include the zoned area, with three receiver positions assessed as shown in appendix 6. Predicted levels in the zoned area are presented in **Table 4.2**, at a height of 2 m above ground level. Existing levels are taken from **Section 4.7**. The highest pre-mitigation level predicted is 47 dB, calculated at the western boundary of the zoned area. This level will marginally exceed the 45 dB evening limit identified in **Section 4.2**.

Table 4.2: Predicted noise levels (as dB).

Receptor	Pre-mitigation LAeq T	Post mitigation LAeq T	Criterion		Existing daytime		Existing evening	
			Daytime	Evening	Ambient LAeq 15 min	Residual LAF90 15 min	Ambient LAeq 15 min	Residual LAF90 15 min
Zoned area – NW	43	40	55	45	53	46	50	43
Zoned area – W	47	40	55	45	51	44*	48	41*
Zoned area – SW	46	44	55	45	50	43*	47	40*

In order to meet the evening criterion at all positions in the zoned area, the applicant proposes to erect an acoustic barrier along the northeast and east boundary of the development site, as shown in **Figure 4.10**. The barrier will consist of a solid proprietary screen of height 2 m. Received levels at the three receiver positions assessed in the zoned area will reduce to less than 45 dB. Noise levels across the zoned area will therefore be lower than the 55 dB daytime and 45 dB evening limits identified in section 6.2. Predicted levels are also generally less than ambient noise levels throughout the day and evening. A comparison with ambient levels presented in Appendix 4.8 indicates that, as 2200 h approaches, predicted levels will begin to marginally exceed LAF90 15 min levels estimated at the western boundary and southwestern corner of the zoned area. Received levels deeper in the zoned area will be lower, and thus less than likely ambient levels.

4.8. Mitigation

In order to meet noise criteria discussed in section 4.2, the predictive modelling process identified the need for the following mitigation measures, which have been agreed with the applicant:

- A maximum of 10 karts will use the track simultaneously.
- An acoustic barrier 2 m in height will be erected between the proposed club house and the southern boundary. The barrier will be constructed using solid proprietary panels such as those used on motorways. The panels will be erected so as to avoid any gaps or openings between panels.
- A similar barrier will be erected along the northeast and east perimeter.

In addition to the foregoing, the applicant has agreed to the following general measures:

- It is not proposed to install a public address system or external telephone bells.
- All defective karts, particularly those with damaged or worn exhaust silencers, will be immediately removed from the track and will be side lined until the necessary repairs have been affected.

The assessment is based on a gas powered 270 cc Sodikart, with sound pressure levels as shown in **Figure 4.5** above. Where it is necessary to use an alternative kart, the applicant will source a model which generates sound pressure levels that do not exceed levels shown in **Figure 4.5**. Track users who wish to use their own karts on the track will be required to show compliance with **Figure 4.5** levels beforehand.

4.9. Effects summary

Noise impacts are summarised in **Table 4.3**. The assessment indicates that noise emissions from karts using the proposed track will give rise to noise levels at NSLs which do not exceed the 55 dB daytime criterion or 45 dB evening criterion. Levels will also be lower than existing LAeq 15 min levels and LAF90 15 min levels at NSLs.

In the area zoned tourism and recreation to the east, predicted levels will also be lower than ambient LAeq 15 min levels, and generally less than LAF90 15 min levels. LAF90 15 min levels at the western and southwestern fringes of the zoned area will be marginally exceeded as 2200 h approaches. Existing levels deeper in the zoned area are unlikely to be exceeded at any time.

Several mitigation measures have been agreed with the applicant. A number of these are required to ensure consistency with the predictive model.

There are no local noise sources of significance other than road traffic. Cumulative impacts are therefore not expected to arise.

Table 4.3: Qualification of noise impacts.

Aspect	Category	Description	Assessment
Frequency	Continuous	Present for extended periods	
	Intermittent	Present at intervals	□
	Occasional	Extended absences	
Duration	Temporary	<1 year	
	Short term	1-7 years	
	Medium term	7-15 years	□
	Long term	15-60 years	
	Permanent	>60 years	
Magnitude	Micro	<10 m	

	Near zone	<100 m	
	Localised	<200 m	
	Local	<500 m	□
	Community	<1000 m	
	Distant	>1000 m	
Quantification	Imperceptible	Capable of measurement but without noticeable consequences, <3 dB	□
	Slight	Causing noticeable changes in character of environment without affecting its sensitivities, 3-5 dB	
	Noticeable	Altering character of environment in manner consistent with existing & emerging trends, 6-10 dB	
	Substantial	Altering sensitive aspect(s) of environment due to character, magnitude, duration or intensity, 11-15 dB	
	Profound	Obliterates sensitive characteristics of environment, >15 dB	
Impact	Negative	Reduces quality of noise environment	
	Neutral	Noise environment remains unchanged	□
	Positive	Improves noise environment	

Based on *Guidelines on the information to be contained in environmental impact statements* (EPA, 2002) and *Advice notes on current practice in the preparation of environmental impact statements* (EPA, 2003).

Appendix 4.1: 2017 survey details

File	Project ref.	141
	Client	Howick O'Brien Consulting Engineers OBO Buttimer Engineering
	Location	Cahir Abbey Industrial Estate Cahir Tipperary
	Stations	Onsite: - Offsite: N2 NGR: 604694 625710
	Purpose	NIA ambient survey
	Comment	Attended survey
Event	Period	Daytime & evening
	Date	06.07.17
	Day	Thursday
	Time	1600-2215
	Operator	Damian Brosnan BSc MSc MIOA MIEI
	Sound level meter	2250
Conditions	Cloud cover	Varying 90-100 %
	Precipitation	0 mm
	Temperature	19 °C

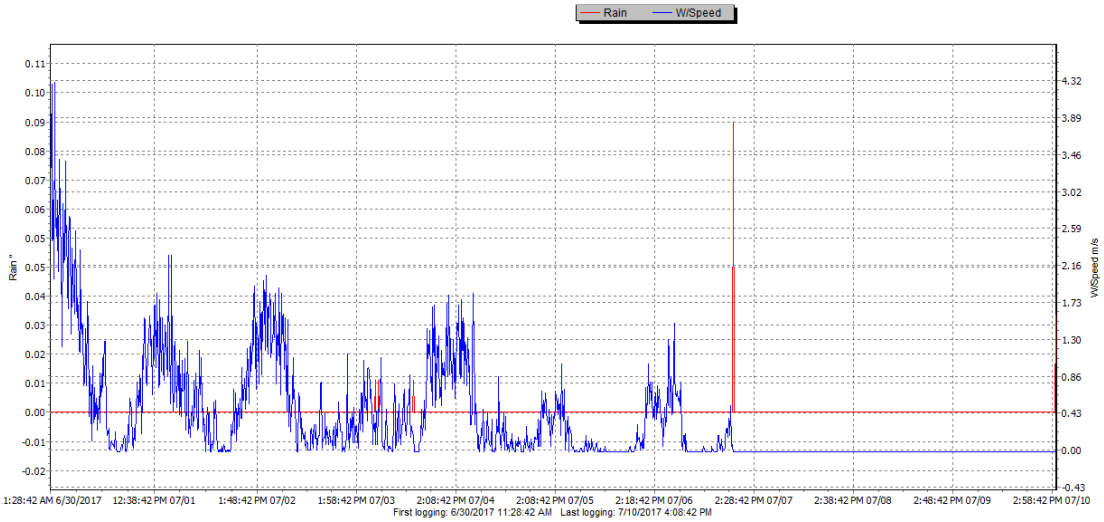
Wind	Direction	SW
	Speed	0-2 m/s
	Measurement	Anemo anemometer 2 m above ground level
Sound level meter	Instrument	Bruel & Kjaer Type 2250
	Instrument serial no.	2506594
	Microphone serial no.	2529531
	Application	BZ7224 Version 2.5
	Bandwidth	Broadband & 1/3 octaves
	Max. input level	141.16 dB
	Broadband weightings	Time: Fast Frequency: AC
	Spectrum weightings	Time: Fast Frequency: Z
	Windscreen correction	UA-1650
	Sound field correction	Free-field
	UKAS calibration	08.02.16
	Calibrating laboratory	Bruel & Kjaer Denmark
	Calibration certificate	Available on request
Onsite calibration	Time	06/07/2017 16:20:43
	Type	External
	Sensitivity	47.18 mV/Pa
	Post survey check	93.9 dB
Onsite calibrator	Instrument	Bruel & Kjaer Type 4231
	Instrument serial no.	3017723
	UKAS calibration	20.01.17
	Calibrating laboratory	Bruel & Kjaer Denmark
	Calibration certificate	Available on request
Uncertainty	Instrumentation	±1 dB (IEC 61672:2002 Class 1)
	External	±0-3 dB (station & weather dependent, estimated)
	Total	±5 dB (estimated, including expanded uncertainty)
Methodology	Standards	ISO 1996 (2007 & 2016) BS 4142 (2014)
	Microphone position	Free field, 1.5 m above ground level
	Intervals	15 min

File	Project ref.	141
	Client	Howick O'Brien Consulting Engineers OBO Buttimer Engineering
	Location	Cahir Abbey Industrial Estate Cahir Tipperary
	Stations	Onsite: - Offsite: N1 NGR: 604911 625730
	Purpose	NIA ambient survey
	Comment	Unattended logging at N1
Event	Period	24 h continuous
	Date	30.06.17—07.06.17
	Day	Friday—Friday
	Time	24 h
	Operator	Damian Brosnan BSc MSc MIOA MIEI
	Sound level meter	2250L
Conditions	Cloud cover	Varying, generally 100 %

	Precipitation	See **appendix 2**
	Temperature	Varying, daytime highs typically 15-18 °C, night-time lows > 10 °C
Wind	Direction	Chiefly SW
	Speed	See **appendix 2**
	Measurement	Anemometer on 4 m mast at N1, logging at 10 min
Sound level meter	Instrument	Bruel & Kjaer Type 2250-L
	Instrument serial no.	2566801
	Microphone serial no.	2571655
	Application	BZ7130 Version 2.0
	Bandwidth	Broadband & 1/3 octaves
	Max. input level	142.66 dB
	Broadband weightings	Time: Fast Frequency: AC
	Spectrum weightings	Time: Fast Frequency: Z
	Windscreen correction	UA1404 outdoor kit with EH-2152 secondary windscreen
	Sound field correction	Free-field
	UKAS calibration	24.01.17
	Calibrating laboratory	Bruel & Kjaer Denmark
	Calibration certificate	Available on request
Onsite calibration	Time	30/06/2017 11:23:50
	Type	External
	Sensitivity	42.31 mV/Pa
	Post survey check	93.9 dB
Onsite calibrator	Instrument	Bruel & Kjaer Type 4231
	Instrument serial no.	3017723
	UKAS calibration	20.01.17
	Calibrating laboratory	Bruel & Kjaer Denmark
	Calibration certificate	Available on request
Uncertainty	Instrumentation	±1 dB (IEC 61672:2002 Class 1)
	External	±0-3 dB (station & weather dependent, estimated)
	Total	±5 dB (estimated, including expanded uncertainty)
Methodology	Standards	ISO 1996 (2007 & 2016) BS 4142 (2014)
	Microphone position	Free field, 1.5 m above ground level
	Intervals	15 min

Appendix 4.2: 2017 survey weather data

Data recorded by anemometer on 4 m mast at N1, and Texas Instruments tipping rainfall gauge. Data recorded after 1000 h on 07.07.16 may be ignored.



Appendix 4.3: 2017 survey noise data

Intervals where any rainfall was recorded were removed from the dataset. Preceding intervals were also removed, as the gauge is a tipping model. There were no periods where wind speed exceeded 5 m/s. Periods outside the proposed operating hours 1200-2200 h are removed.

N1 data

Date	Start time	$L_{Aeq\ 15\ min}$ dB	$L_{AF90\ 15\ min}$ dB
30/06/2017	12:00:00	61	56
30/06/2017	12:15:00	59	55
30/06/2017	12:30:00	57	54
30/06/2017	12:45:00	57	54
30/06/2017	13:00:00	56	54
30/06/2017	13:15:00	55	53
30/06/2017	13:30:00	55	53
30/06/2017	13:45:00	54	52
30/06/2017	14:00:00	56	53
30/06/2017	14:15:00	55	53
30/06/2017	14:30:00	56	53
30/06/2017	14:45:00	55	53
30/06/2017	15:00:00	55	53
30/06/2017	15:15:00	54	51
30/06/2017	15:30:00	55	52
30/06/2017	15:45:00	54	52
30/06/2017	16:00:00	54	51
30/06/2017	16:15:00	53	51
30/06/2017	16:30:00	55	52
30/06/2017	16:45:00	53	51
30/06/2017	17:00:00	52	51
30/06/2017	17:15:00	52	51
30/06/2017	17:30:00	53	51
30/06/2017	17:45:00	52	51

Date	Start time	$L_{Aeq\ 15\ min}$ dB	$L_{AF90\ 15\ min}$ dB
03/07/2017	16:30:00	47	42
03/07/2017	16:45:00	45	42
03/07/2017	17:00:00	51	43
03/07/2017	17:15:00	45	43
03/07/2017	17:30:00	45	43
03/07/2017	17:45:00	44	41
03/07/2017	18:30:00	44	42
03/07/2017	18:45:00	43	42
03/07/2017	19:30:00	46	44
03/07/2017	19:45:00	46	44
03/07/2017	20:00:00	45	43
03/07/2017	20:15:00	44	41
03/07/2017	20:30:00	44	41
03/07/2017	20:45:00	43	40
03/07/2017	21:00:00	53	41
03/07/2017	21:15:00	43	40
03/07/2017	21:30:00	42	40
03/07/2017	21:45:00	43	41
04/07/2017	12:00:00	48	45
04/07/2017	12:15:00	49	46
04/07/2017	12:30:00	49	46
04/07/2017	12:45:00	48	44
04/07/2017	13:00:00	48	44
04/07/2017	13:15:00	47	44

30/06/2017	18:00:00	52	50
30/06/2017	18:15:00	51	49
30/06/2017	18:30:00	51	49
30/06/2017	18:45:00	51	49
30/06/2017	19:00:00	50	48
30/06/2017	19:15:00	50	49
30/06/2017	19:30:00	50	48
30/06/2017	19:45:00	49	47
30/06/2017	20:00:00	49	47
30/06/2017	20:15:00	50	48
30/06/2017	20:30:00	50	48
30/06/2017	20:45:00	49	47
30/06/2017	21:00:00	48	45
30/06/2017	21:15:00	46	43
30/06/2017	21:30:00	48	44
30/06/2017	21:45:00	47	45
01/07/2017	12:00:00	48	45
01/07/2017	12:15:00	48	46
01/07/2017	12:30:00	48	46
01/07/2017	12:45:00	49	48
01/07/2017	13:00:00	49	47
01/07/2017	13:15:00	47	46
01/07/2017	13:30:00	47	45
01/07/2017	13:45:00	47	45
01/07/2017	14:00:00	47	45
01/07/2017	14:15:00	48	46
01/07/2017	14:30:00	49	47
01/07/2017	14:45:00	49	47
01/07/2017	15:00:00	49	47
01/07/2017	15:15:00	50	48
01/07/2017	15:30:00	49	47
01/07/2017	15:45:00	48	46
01/07/2017	16:00:00	49	47
01/07/2017	16:15:00	49	47
01/07/2017	16:30:00	49	47
01/07/2017	16:45:00	49	46
01/07/2017	17:00:00	48	46
01/07/2017	17:15:00	48	45
01/07/2017	17:30:00	49	46
01/07/2017	17:45:00	48	46
01/07/2017	18:00:00	47	44
01/07/2017	18:15:00	47	45
01/07/2017	18:30:00	48	45
01/07/2017	18:45:00	47	44
01/07/2017	19:00:00	47	45
01/07/2017	19:15:00	47	45
01/07/2017	19:30:00	46	44
01/07/2017	19:45:00	46	44
01/07/2017	20:00:00	47	45
01/07/2017	20:15:00	47	44
01/07/2017	20:30:00	47	44
01/07/2017	20:45:00	46	43
01/07/2017	21:00:00	44	41
01/07/2017	21:15:00	46	40

04/07/2017	13:30:00	48	45
04/07/2017	13:45:00	47	45
04/07/2017	14:00:00	48	45
04/07/2017	14:15:00	50	44
04/07/2017	14:30:00	47	45
04/07/2017	14:45:00	57	44
04/07/2017	15:00:00	48	43
04/07/2017	15:15:00	46	44
04/07/2017	15:30:00	47	45
04/07/2017	15:45:00	49	45
04/07/2017	16:00:00	49	44
04/07/2017	16:15:00	46	42
04/07/2017	16:30:00	47	44
04/07/2017	16:45:00	50	45
04/07/2017	17:00:00	52	46
04/07/2017	17:15:00	47	45
04/07/2017	17:30:00	47	45
04/07/2017	17:45:00	48	45
04/07/2017	18:00:00	47	45
04/07/2017	18:15:00	47	45
04/07/2017	18:30:00	47	43
04/07/2017	18:45:00	46	44
04/07/2017	19:00:00	46	44
04/07/2017	19:15:00	44	42
04/07/2017	19:30:00	43	40
04/07/2017	19:45:00	44	41
04/07/2017	20:00:00	43	39
04/07/2017	20:15:00	45	41
04/07/2017	20:30:00	45	41
04/07/2017	20:45:00	43	40
04/07/2017	21:00:00	56	41
04/07/2017	21:15:00	45	40
04/07/2017	21:30:00	43	41
04/07/2017	21:45:00	44	41
05/07/2017	12:00:00	47	40
05/07/2017	12:15:00	46	41
05/07/2017	12:30:00	45	42
05/07/2017	12:45:00	47	42
05/07/2017	13:00:00	45	41
05/07/2017	13:15:00	44	42
05/07/2017	13:30:00	45	41
05/07/2017	13:45:00	44	42
05/07/2017	14:00:00	46	43
05/07/2017	14:15:00	45	43
05/07/2017	14:30:00	46	44
05/07/2017	14:45:00	45	43
05/07/2017	15:00:00	45	42
05/07/2017	15:15:00	42	40
05/07/2017	15:30:00	44	41
05/07/2017	15:45:00	49	41
05/07/2017	16:00:00	47	42
05/07/2017	16:15:00	47	42
05/07/2017	16:30:00	45	40
05/07/2017	16:45:00	49	38

01/07/2017	21:30:00	42	38
01/07/2017	21:45:00	44	40
02/07/2017	12:00:00	44	42
02/07/2017	12:15:00	44	42
02/07/2017	12:30:00	45	42
02/07/2017	12:45:00	46	43
02/07/2017	13:00:00	45	42
02/07/2017	13:15:00	44	42
02/07/2017	13:30:00	44	41
02/07/2017	13:45:00	44	42
02/07/2017	14:00:00	45	42
02/07/2017	14:15:00	44	42
02/07/2017	14:30:00	45	42
02/07/2017	14:45:00	46	43
02/07/2017	15:00:00	47	45
02/07/2017	15:15:00	45	43
02/07/2017	15:30:00	45	43
02/07/2017	15:45:00	46	44
02/07/2017	16:00:00	45	43
02/07/2017	16:15:00	45	43
02/07/2017	16:30:00	45	43
02/07/2017	16:45:00	45	42
02/07/2017	17:00:00	54	43
02/07/2017	17:15:00	49	43
02/07/2017	17:30:00	45	43
02/07/2017	17:45:00	46	43
02/07/2017	18:00:00	48	46
02/07/2017	18:15:00	48	45
02/07/2017	18:30:00	47	46
02/07/2017	18:45:00	48	46
02/07/2017	19:00:00	48	47
02/07/2017	19:15:00	49	47
02/07/2017	19:30:00	50	48
02/07/2017	19:45:00	49	48
02/07/2017	20:00:00	47	45
02/07/2017	20:15:00	47	45
02/07/2017	20:30:00	48	46
02/07/2017	20:45:00	47	45
02/07/2017	21:00:00	48	45
02/07/2017	21:15:00	46	44
02/07/2017	21:30:00	46	43
02/07/2017	21:45:00	46	43
03/07/2017	12:00:00	41	38
03/07/2017	12:15:00	49	41
03/07/2017	12:30:00	47	42
03/07/2017	12:45:00	48	43
03/07/2017	13:00:00	46	41
03/07/2017	13:15:00	45	41
03/07/2017	13:30:00	47	40
03/07/2017	13:45:00	46	39
03/07/2017	14:00:00	47	40
03/07/2017	14:15:00	43	40
03/07/2017	14:30:00	43	41
03/07/2017	14:45:00	51	42

05/07/2017	17:00:00	47	39
05/07/2017	17:15:00	42	40
05/07/2017	17:30:00	44	41
05/07/2017	17:45:00	43	41
05/07/2017	18:00:00	41	37
05/07/2017	18:15:00	40	37
05/07/2017	18:30:00	42	37
05/07/2017	18:45:00	39	35
05/07/2017	19:00:00	44	35
05/07/2017	19:15:00	39	36
05/07/2017	19:30:00	38	36
05/07/2017	19:45:00	40	37
05/07/2017	20:00:00	40	36
05/07/2017	20:15:00	44	35
05/07/2017	20:30:00	40	37
05/07/2017	20:45:00	40	38
05/07/2017	21:00:00	40	38
05/07/2017	21:15:00	41	39
05/07/2017	21:30:00	42	40
05/07/2017	21:45:00	42	40
06/07/2017	12:00:00	50	44
06/07/2017	12:15:00	46	44
06/07/2017	12:30:00	45	43
06/07/2017	12:45:00	46	42
06/07/2017	13:00:00	46	44
06/07/2017	13:15:00	49	44
06/07/2017	13:30:00	46	44
06/07/2017	13:45:00	47	43
06/07/2017	14:00:00	49	42
06/07/2017	14:15:00	47	42
06/07/2017	14:30:00	45	42
06/07/2017	14:45:00	46	39
06/07/2017	15:00:00	45	42
06/07/2017	15:15:00	46	43
06/07/2017	15:30:00	51	44
06/07/2017	15:45:00	50	45
06/07/2017	16:00:00	48	44
06/07/2017	16:15:00	47	42
06/07/2017	16:30:00	47	42
06/07/2017	16:45:00	47	45
06/07/2017	17:00:00	51	47
06/07/2017	17:15:00	49	47
06/07/2017	17:30:00	49	46
06/07/2017	17:45:00	50	48
06/07/2017	18:00:00	49	47
06/07/2017	18:15:00	49	46
06/07/2017	18:30:00	48	46
06/07/2017	18:45:00	48	46
06/07/2017	19:00:00	49	47
06/07/2017	19:15:00	47	45
06/07/2017	19:30:00	50	46
06/07/2017	19:45:00	49	46
06/07/2017	20:00:00	48	46
06/07/2017	20:15:00	48	47

03/07/2017	15:00:00	46	43
03/07/2017	15:15:00	46	44
03/07/2017	15:30:00	46	44
03/07/2017	15:45:00	47	43
03/07/2017	16:00:00	49	43
03/07/2017	16:15:00	52	43

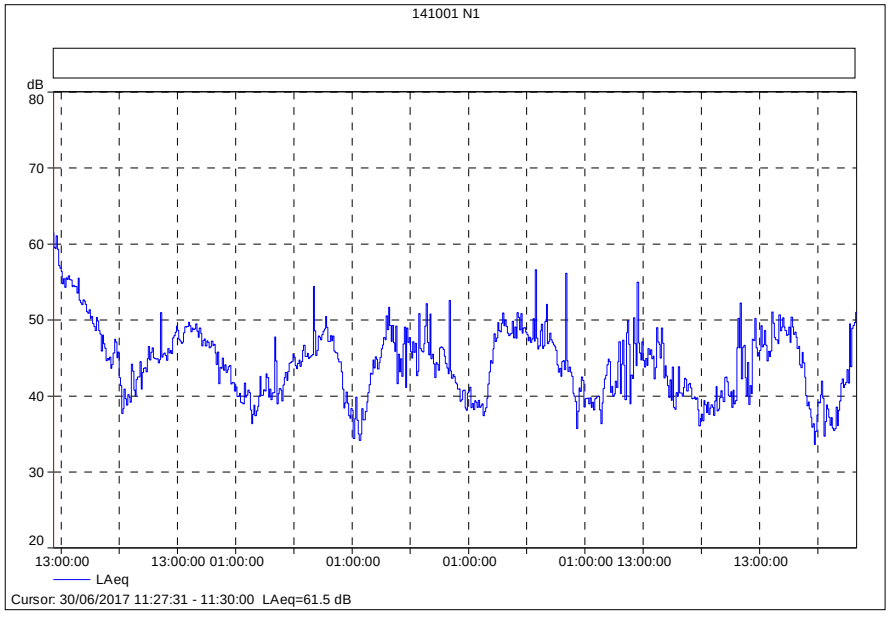
06/07/2017	20:30:00	48	45
06/07/2017	20:45:00	46	43
06/07/2017	21:00:00	47	44
06/07/2017	21:15:00	44	41
06/07/2017	21:30:00	44	41
06/07/2017	21:45:00	46	43

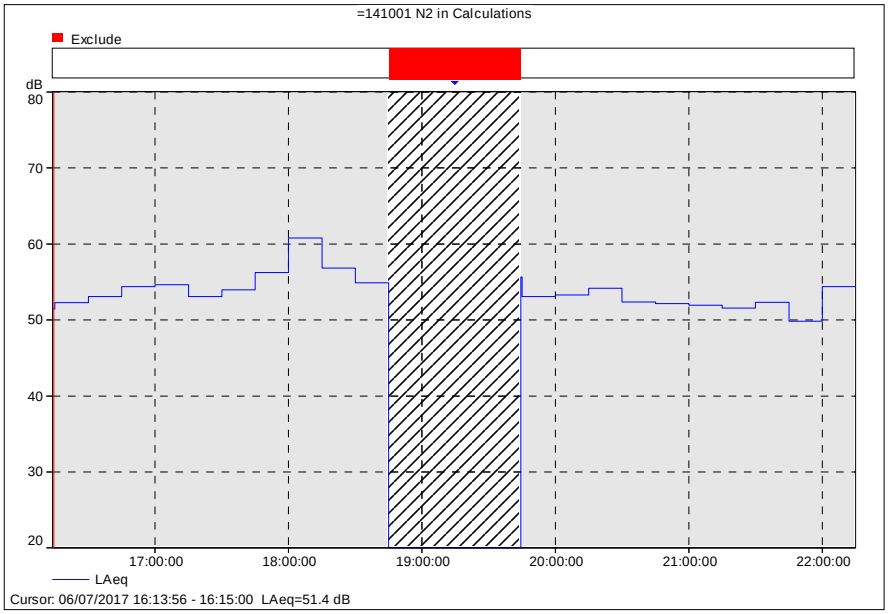
N2 data

Date	Time	$L_{Aeq\ 15\ min}$ dB	$L_{AF90\ 15\ min}$ dB
06.07.17	1615-1630	52	43
06.07.17	1630-1645	53	45
06.07.17	1645-1700	54	46
06.07.17	1700-1715	55	48
06.07.17	1715-1730	53	46
06.07.17	1730-1745	54	48
06.07.17	1745-1800	56	49
06.07.17	1800-1815	61	48
06.07.17	1815-1830	57	47
06.07.17	1830-1845	55	48
06.07.17	1845-1900	54	52

Date	Time	$L_{Aeq\ 15\ min}$ dB	$L_{AF90\ 15\ min}$ dB
06.07.17	1945-2000	53	46
06.07.17	2000-2015	53	47
06.07.17	2015-2030	54	46
06.07.17	2030-2045	52	43
06.07.17	2045-2100	52	44
06.07.17	2100-2115	52	41
06.07.17	2115-2130	52	39
06.07.17	2130-2145	52	42
06.07.17	2145-2200	50	40

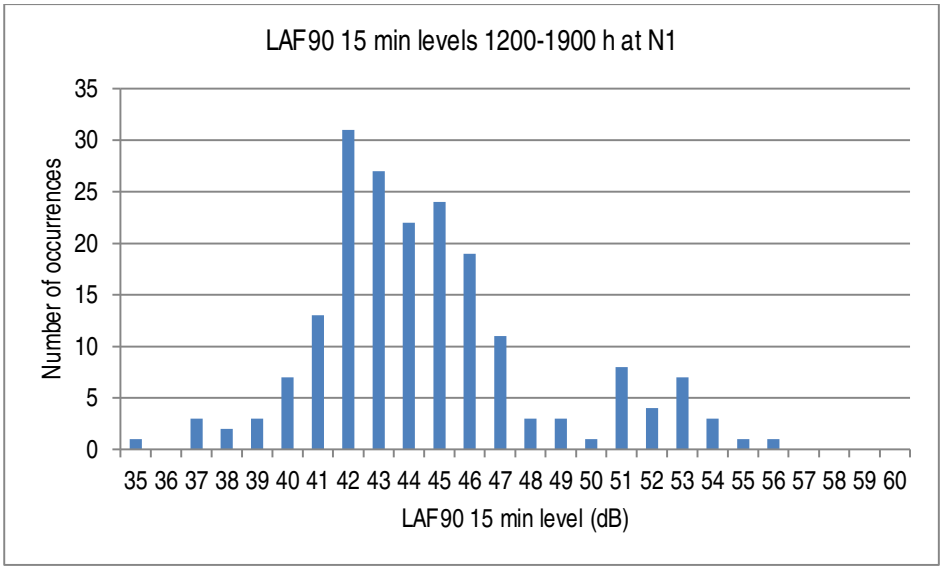
Appendix 4.4: 2017 survey profiles

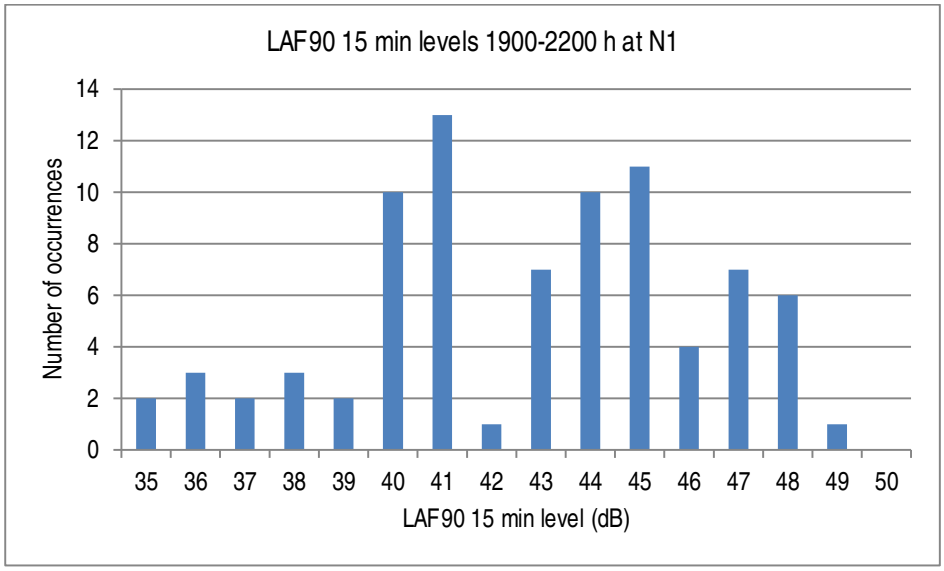




Exclusion due to temporary pause in survey.

Appendix 4.5: N1 distribution





Based on guidance given in *British Standard BS 4142:2014 Methods for rating and assessing industrial and commercial sound* (2014), background $L_{AF90\ 15\ min}$ levels during daytime and evening hours at N1 are considered to be 42 and 41 dB respectively. This assessment is based on separate daytime and evening periods, whereas BS 4142:2014 defines daytime as 0700-2300 h.

Appendix 4.6: Prediction modelling

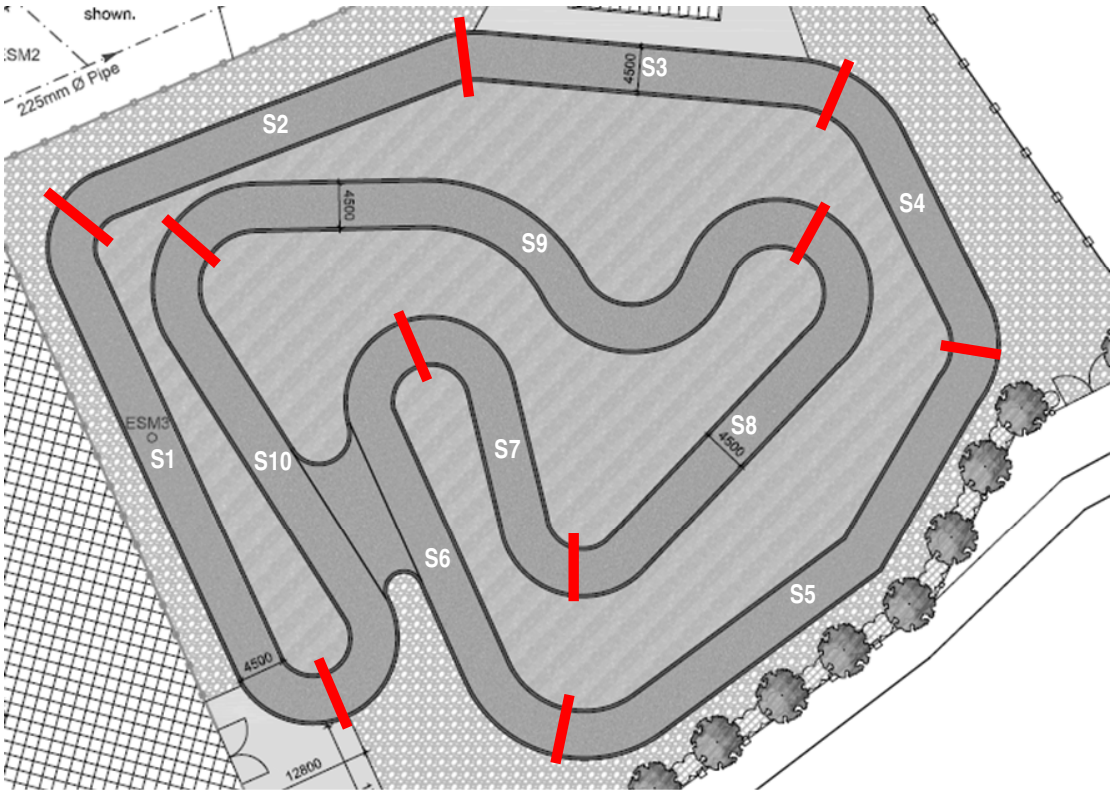
International Standard ISO 9613-2:1996 Acoustics: Attenuation of sound during propagation outdoors, Part 2 General method of calculation (1996) is considered the most suitable model. Modelling was undertaken using a purpose-built spreadsheet-based model. Model assumptions are as follows:

- Kart source noise levels are presented in the table below, as measured at Midland Karting (see **section 5** above).
- Source data correspond to high engine revolutions, approaching 5000 RPM.
- 10 karts racing simultaneously are modelled, spread around the track, travelling clockwise.
- Each kart constitutes an individual point source.
- The track is divided into 10 segments as shown below, each containing one kart at segment mid-point.
- Directivity is factored by taking kart direction on track segment into account. *D*c is therefore assumed to be 0.
- The model assumes that all receptors are simultaneously downwind.
- 10 °C and 70 % relative humidity is assumed.
- Levels predicted at nearest receptors, with representative receptors selected in dwelling clusters.
- Where applicable, single diffraction (Maekawa method) is assumed for all barriers/screens, including intervening buildings. Model includes completion of new building immediately west of track, previously permitted by TCC. Distance to barrier is taken from track midpoint as simplification.

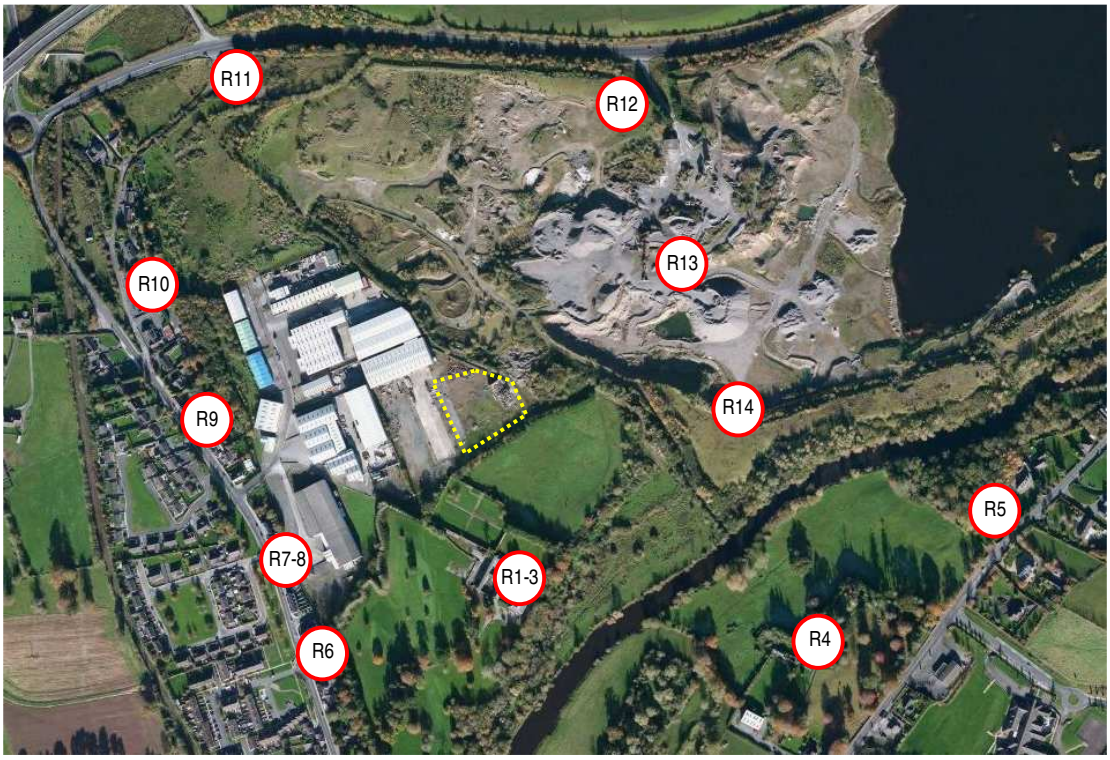
Kart source noise levels at 1 m (dB).

Location	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	A-weighted
Front	61	76	84	85	88	88	84	79	93
Left	58	73	78	83	85	85	82	76	90
Right	64	79	82	84	87	85	82	76	92
Rear	71	80	85	86	87	88	86	81	94

Track segments.



Modelled receptors.



Appendix 4.7: 2018 survey details

File	Project ref.	141
	Client	Howick O'Brien Consulting Engineers OBO Buttimer Engineering
	Location	Cahir Abbey Industrial Estate Cahir Tipperary
	Stations	Onsite: - Offsite: N3 NGR: 605168 626294
	Purpose	NIA ambient survey
	Comment	Attended survey
Event	Period	Daytime & evening
	Date	16.12.18
	Day	Sunday
	Time	1400-2200
	Operator	Damian Brosnan BSc MSc MIOA MIEI
	Sound level meter	XL2-1
Conditions	Cloud cover	0 %
	Precipitation	0 mm
	Temperature	7 falling to 4 °C
Wind	Direction	SW
	Speed	0-1 m/s
	Measurement	Anemo anemometer 2 m above ground level
Sound level meter	Instrument	NTi XL2-1
	Instrument serial no.	A2A-13658-E0

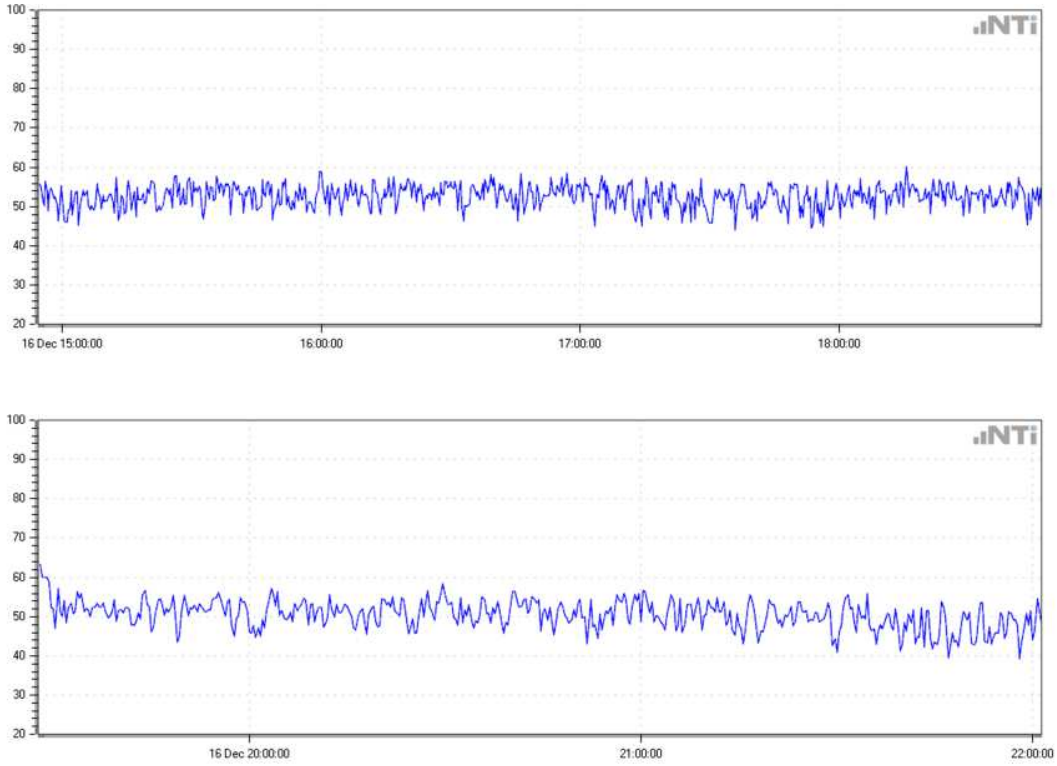
	Microphone serial no.	A14735 + pre-amp 7066
	Bandwidth	Broadband & 1/3 octaves
	Range	20-120 dB
	Broadband weightings	Time: Fast Frequency: AC
	Spectrum weightings	Time: Fast Frequency: Z
	Windscreen correction	WP-30 horizontal
	Sound field correction	Free-field
	UKAS calibration	09.11.17
	Calibrating laboratory	NTi Liechtenstein
	Calibration certificate	Available on request
Onsite calibration	Time	16.12.18 1422
	Type	External
	Sensitivity	39.8 mV/Pa
	Post survey check	93.9 dB
Onsite calibrator	Instrument	Bruel & Kjaer Type 4231
	Instrument serial no.	2342544
	Laboratory calibration	16.01.18
	Calibrating laboratory	Sonitus
	Calibration certificate	Available on request
Uncertainty	Instrumentation	±1 dB (IEC 61672:2002 Class 1)
	External	±0-3 dB (station & weather dependent, estimated)
	Total	±5 dB (estimated, including expanded uncertainty)
Methodology	Standards	ISO 1996 (2007 & 2016) BS 4142 (2014)
	Microphone position	Free field, 1.5 m above ground level
	Intervals	Logging at 1 s Intervals extracted

Appendix 4.8: 2018 survey noise data

N3 data

Date	Time	$L_{Aeq\ 15\ min}$ dB	$L_{AF90\ 15\ min}$ dB
16.12.18	1500-1515	52	46
16.12.18	1515-1530	54	47
16.12.18	1530-1545	54	48
16.12.18	1545-1600	53	48
16.12.18	1600-1615	53	48
16.12.18	1615-1630	54	49
16.12.18	1630-1645	54	48
16.12.18	1645-1700	54	48
16.12.18	1700-1715	53	46
16.12.18	1715-1730	53	46
16.12.18	1730-1745	53	45
16.12.18	1745-1800	52	45
16.12.18	1800-1815	53	47

Date	Time	$L_{Aeq\ 15\ min}$ dB	$L_{AF90\ 15\ min}$ dB
16.12.18	1815-1830	54	49
16.12.18	1830-1845	53	47
16.12.18	1930-1945	52	47
16.12.18	1945-2000	52	46
16.12.18	2000-2015	52	46
16.12.18	2015-2030	52	45
16.12.18	2030-2045	52	46
16.12.18	2045-2100	52	44
16.12.18	2100-2115	52	45
16.12.18	2115-2130	51	43
16.12.18	2130-2145	50	42
16.12.18	2145-2200	49	40



Appendix 4.9: Glossary

Ambient	Total noise environment at a location, including all sounds present.
Amplitude	Maximum extent of oscillation in a noise signal. Greater amplitude results in louder signal.
A-weighting	Weighting or adjustment applied to sound level to approximate non-linear frequency response of human ear. Denoted by suffix A in parameters such as $L_{Aeq\,T}$, $L_{AF10\,T}$, etc.
Background level	A-weighted sound pressure level of residual noise exceeded for 90 % of time interval T. Denoted $L_{AF90\,T}$.
Broadband	Noise which contains roughly equal energy across frequency spectrum. Does not contain tones, and is generally less annoying than tonal noise.
Decibel (dB)	Unit of noise measurement scale. Based on logarithmic scale so cannot be simply added or subtracted. 3 dB difference is smallest change perceptible to human ear. 10 dB difference is perceived as doubling or halving of sound level. Examples of decibel levels are as follows: 20 dB: very quiet room; 30-35 dB: night-time rural environment; 55-65 dB: conversation; 80 dB: busy pub; 100 dB: nightclub. **Throughout this report noise levels are presented as decibels relative to 20 µPa**.
Fast response	0.125 seconds response time of sound level meter to changing noise levels. Denoted by suffix F in parameters such as $L_{AF10\,T}$, $L_{AF90\,T}$, etc.
Free field	Noise environment away from all surfaces other than ground ie. outside near field.
Frequency	Number of cycles per second of a sound or vibration wave. Low frequency noise may be perceived as hum, while whine represents higher frequency. Range of human hearing approaches 20-20,000 Hertz.
Hertz (Hz)	Unit of frequency measurement.

Impulse	Noise which is of short duration, typically less than one second, sound pressure level of which is significantly higher than background.
Interval	Time period T over which noise parameters are measured at position. Denoted by T in $L_{Aeq\,T}$, $L_{AF90\,T}$, etc.
$L_{Aeq\,T}$	Equivalent continuous sound pressure level during interval T, effectively representing average A-weighted noise level of ambient noise environment.
$L_{AF10\,T}$	Sound pressure level exceeded for 10% of interval T, usually used to quantify traffic noise.
$L_{AF90\,T}$	Sound pressure level exceeded for 90% of interval T, usually used to quantify background noise. May also be used to describe noise level from continuous steady or almost-steady source, particularly where local noise environment fluctuates.
L_{WA}	Sound power level generated by source due to conversion of work energy into noise energy.
Masking	The rendering inaudible of one noise source by another noise source(s) which may be louder, or may contain significant acoustic energy in the same part of the frequency spectrum. In the latter case, any tone(s) in the original source emissions may become inaudible.
Near field	Noise levels recorded near walls or other surfaces, artificially increased due to reflections. Levels near walls may be increased by up to 3 dB, and up to 6 dB near corners. Free field conditions may be achieved by maintaining separation distance of at least 3.5 m from walls.
Noise sensitive location	Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or area of high amenity which for its proper enjoyment requires absence of noise at nuisance levels.
1/3 octave band	Frequency spectrum may be divided into octave bands. Upper limit of each octave is twice lower limit. Each octave may be subdivided into thirds, allowing greater analysis of tones.
Residual level	Noise level remaining when specific source is absent or does not contribute to ambient.
Specific level	$L_{Aeq\,T}$ level produced by specific noise source under consideration during interval T, measured directly or by estimation or calculation.
Tone	Character of noise caused by dominance of one or more frequencies which may result in increased noise nuisance.
Wind vector	May be positive (+), negative (-), neutral (0) or crosswind (x). Positive wind vector blows from source to receptor, within angular range of ±45°, creating conditions more favourable to propagation. During certain conditions, this range may increase to ±60° by day and ±90° at night. Negative wind vector occurs when receptor is upwind of source. Neutral vector arises during still conditions, or upwind when in close proximity to source. Crosswinds typically result in negative vector.
Z-weighting	Standard weighting applied by sound level meters to represent linear scale. Denoted by suffix Z in parameters such as $L_{Zeq\,T}$, $L_{ZF90\,T}$, etc. used to describe 1/3 octave band levels in frequency spectra.

In this report units are generally presented using US National Institute Of Standards & Technology guidelines.

5. Water, land and soils

5.1 Introduction

In this chapter the existing baseline conditions and character of the land, soil and geological characteristics of the site and an assessment of water resources are presented and the potential impacts anticipated from the development are identified and discussed. Mitigation measures are proposed, residual impacts are assessed and any relevant monitoring options are considered.

5.2 Methodology

The methodology of the this chapter for the Environmental Impact Assessment Report (EIAR) follows Directive 2014/52/EU and Annex IV amendments, as well as the *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment* (2018) prepared by the Department of Housing, Planning and Local Government which outline the process of preparation and the content required for an EIAR.

The methodology takes into account the two Environmental Protection Agency (EPA) draft guideline documents on the preparation of Environmental Impact Statement (EIS), from September 2015, the Institute of Geologists of Ireland (IGI) *Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of EISs*, (IGI April 2013), and National Roads Authority (NRA) *Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* (NRA 2008).

This report aims to;

- Establish baseline conditions
- Identify potential receptors hydraulically connected to the site.
- Assess the risk posed to hydrogeology, soils and water
- Detail mitigation measures that would avoid/limit/mitigate any impacts as required.

The following sources of information were utilised:

- Geological Survey of Ireland (GSI) On-line Geological Datasets, (www.gsi.ie/mapping.htm).
- Ordinance Survey of Ireland, (OSI) On-line Maps/Historic Maps and Aerial Photographs.
- EPA and National Parks & Wildlife Service (NPWS) web based mapping.

Using information from the desktop study and walkover survey, the importance of the soil, geological and hydrogeological environment within the study area was assessed. The guidance criteria for the assessment of impacts require that they be described with respect to various attributes such as extent, magnitude, complexity, probability, duration, frequency and reversibility. In addition the impact characteristics of proximity and probability are also defined. The system used to determine the likely impacts environment is shown in **Table 5.1**.

Table 5.1: Impact assessment matrix.

Impact Characteristics		Potential Impacts
Negative only	Profound	Widespread permanent impact on: - The extent or morphology of a SAC. - Regionally important aquifers. - Extents of floodplains. Mitigation measures are unlikely to remove such impacts.
Positive or Negative	Significant	Local or widespread time dependent impacts on: - The extent or morphology of a SAC / ecologically important area. - A regionally important hydrogeological feature (or widespread effects to minor hydrogeological features). - Extent of floodplains. Widespread permanent impacts on the extent or morphology of an NHA/ecologically important area, Mitigation measures (to design) will reduce but not completely remove the impact – residual impacts will occur.
Positive or Negative	Moderate	Local time dependent impacts on: - The extent or morphology of a SAC / NHA / ecologically important area. - A minor hydrogeological feature. - Extent of floodplains. Mitigation measures can mitigate the impact OR residual impacts occur, but these are consistent with existing or emerging trends
Positive, Negative or Neutral	Slight	Local perceptible time dependent impacts not requiring mitigation.
Neutral	Imperceptible	No impacts, or impacts which are beneath levels of perception, within normal bounds of variation, or within the bounds of measurement or forecasting error.

5.3 Existing environment

5.3.1 General

Cahir is located in the lowlands of the Suir river valley. The topography to the east to the town rises steeply along the foothills of the Galtee Mountains which run southwest towards Mitchelstown. It is located on the junction between the M8 Dublin-Cork Motorway and the N24 Limerick-Waterford National route and on the Waterford-Limerick railway line.

The landscape around Cahir is dominated by two major geographical features; the River Suir and the Galtee Mountains. Lands to the north, east and south of Cahir town are low lying and undulating and are dominated by agricultural grassland. To the west, at the foothills of the Galtee mountains, land is dominated by moorland, forestry and marginal pasture. The proposed development site is located on the edge of Cahir town, just over 1km NNW of the town centre within the Cahir Abbey Industrial Estate.

5.3.2 Soils

The Environmental Protection Agency (EPA) online soil map, indicates that soils across the site, and the surrounding area are mapped as shallow, well-drained, mineral soils, mainly acidic. These soils tend to have a 'gravelly' texture. There is no top-soil within the proposed development site and it is currently covered with hardcore and gravel. It is noted that very limited excavations will be required.

5.3.3 Subsoils

The GSI Spatial Resources Viewer indicates that the main superficial deposit overlying the site is Gravels, derived from Devonian sandstones. The covers a large area which takes in all of the Cahir Abbey Industrial Estate and the former Roadstone Quarry site and running northwest along the N24 A trial hole test was carried out by Howick, O'Brien and Co. to a depth of approximately 2.1m. They found subsoil from 300mm deep to 2.1m deep consisted of silty sand with high gravel content. This suggested a relatively free draining soil and is consistent with the adjacent quarrying land use.

5.3.4 Bedrock Geology

The regional geology comprises Sandstone, Conglomerate and Mudstone to the immediate north and west of the site and Limestone & calcareous shale to the south and east. The folded landscape of anticlines-synclines run in a northeast – southwest direction and are intersected by northeast – southwest striking faults. No boreholes are recorded in proximity to the proposed development on the GSI database.

5.3.4. Geohazards & Karst and geological heritage

No karst geohazards or landslides are mapped on the site. In the wider area there are few karst landforms. No geological heritage sites are present on the site of the proposed development.

5.4 Hydrology

The closest watercourse comprises of a small stream, located 200m west of the proposed development site. This stream flows in southernly direction to meet the River Suir, approximately 550m south of the proposed development site. This stream will not be impacted by the proposed development. The proposed development is located within the Suir Catchment (Catchment Code/Hydrometric Area No. 16). The site is located within the Suir_SC_100 sub-catchment (16_14). There are a number of hydrometric gauge stations in this general area. Information from the Environmental Protection Agency (EPA) shows that there are several water bodies present in the wider area of the site. The status of each water body is also indicated, according to the European Union (EU) Water Framework Directive (WFD). These are outlined in **Table 5.3**.

Table 5.3. Summary of Surface Water Features

Q-Value location	Distance from development (Approximate)	Q-Value Score	Water Framework Directive Status
River Aherlow			
Killardry Br	4.7km northwest of the proposed development site (as the crow flies). 9.7km upstream of the Cahir WWTP primary discharge point and 3.6km upstream of the River Suir confluence.	Q4 - 5 (2017)	High
River Suir			
2 km u/s Cahir	1.0km east-northeast of the proposed development site (as the crow flies). 3.1km upstream of the Cahir WWTP primary discharge point.	Q3 - 4 (2017)	Moderate
Suir - Cahir Br	965m south of the proposed development site (as the crow flies). 1.0km upstream of the Cahir WWTP primary discharge point.	Q3 - 4 (2005)	Moderate
Ford 1.8 km d/s Cahir Park Br	4.3km south of the proposed development site (as the crow flies). 2.7km downstream of the Cahir WWTP primary discharge point.	Q3 - 4 (2017)	Moderate
Outeragh Stream			
Br u/s Suir R confl	1.9km northeast of the proposed development site (as the crow flies). 4.5km upstream of the Cahir WWTP primary discharge point and 1.1km upstream of the River Suir confluence.	Q3 - 4 (2017)	Moderate
Outeragh Stream - Br W of Outeragh	4.2km northeast of the proposed development site (as the crow flies). 7.2km upstream of the Cahir WWTP primary discharge point and 3.7km upstream of the River Suir confluence.	Q3 (2006)	Poor

The proposed development site is located approximately 250 m north of the River Suir main channel. The River Suir flows for a distance of 185km, rising in the Devil's Bit Mountains north of Templemore and flowing into the Atlantic near Waterford City. The River Aherlow and River Outeragh are tributaries of the River Suir. The River Aherlow is a designated Salmonid River (S.I. 293: European Communities (Quality of Salmonid Waters) Regulations, 1988). However this is located upstream of the proposed development site. The location of relevant watercourses in relation to the proposed development site is shown in **Figure 5.1**.

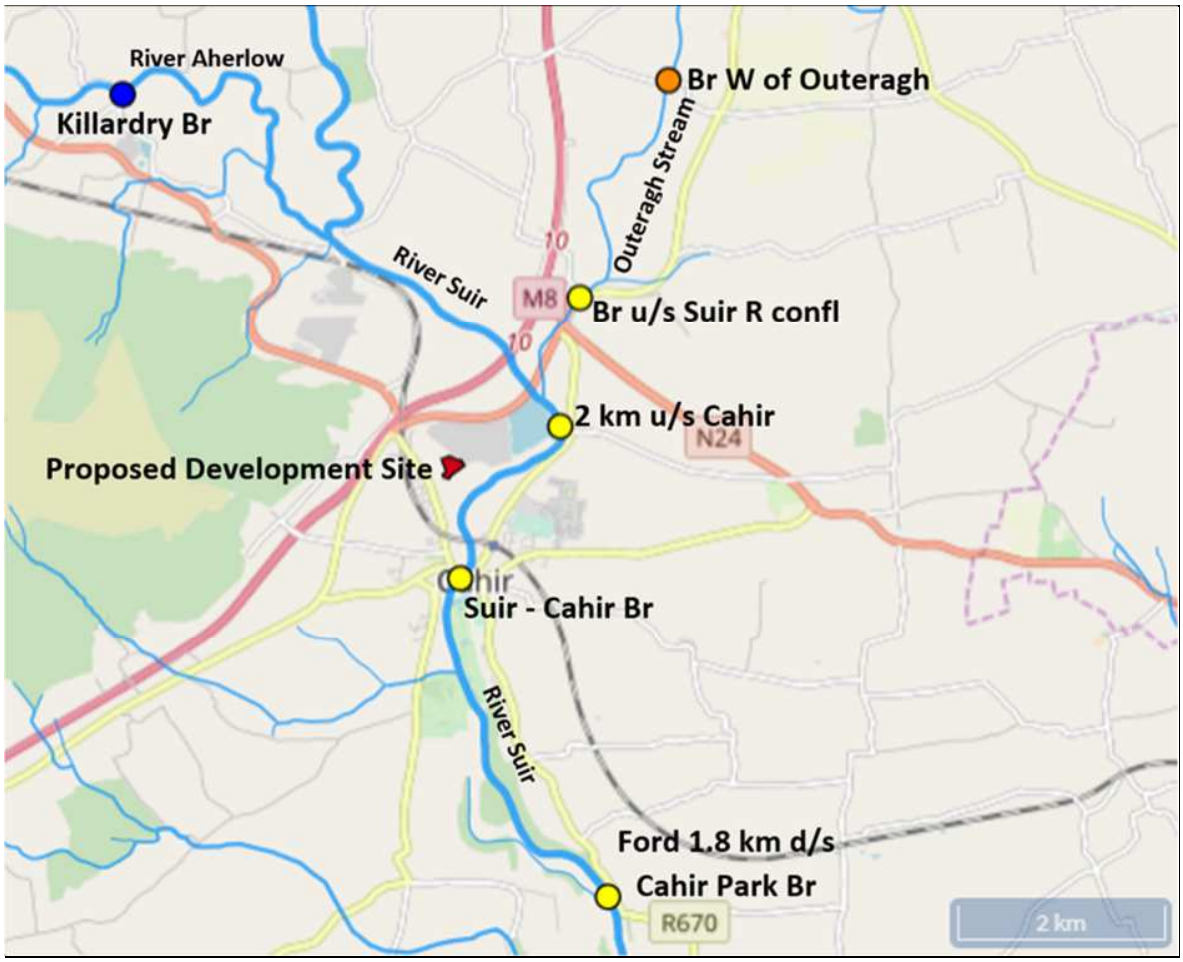


Figure 5.1. Water monitoring locations near by proposed development site.

5.4.1 Site Specific Drainage

The soil characteristics and infiltration rate were examined by Howick, O'Brien & Co. Ltd on the 24th of November 2016. Results indicate that the site is ideally suited to an infiltration system to cater for surface water. Using a spreadsheet model of CIRIA 156 a series of length and width parameters were tested to find an ideal height of the system of less than 1m. Assuming a proprietary infiltration product with a void ratio of 95% is used, than a 25m by 8m system would require a system of 0.86m height to cater for the 1 in 100-year storm.

5.5 Hydrogeology

5.5.1 Regional Hydrogeology

The GSI has developed a classification system for Irish aquifers based on their hydrogeological characteristics; size; and the productivity of the groundwater resource. There are three main groups of aquifers, as follows: Regionally Important Aquifers (R); Locally Important Aquifers (L); and Poor Aquifers (P). The bedrock underlying the proposed site is classified as **a** Regionally Important Aquifer, with fissured bedrock.

The aquifer forms part of the Cahir Groundwater Body (GWB). The groundwater body (GWB) is the management unit under the WFD (Water Framework Directive) that is necessary for the subdivision of large geographical areas of aquifer in order for them to be effectively managed. The Cahir GWB (IE_SE_G_024) lies at the eastern foot of the Galty Mountains. Elevations range from 200m to 50m OD. The topography of the land surface is at times tightly incised by mountain river valleys. The body is bounded to the north by the Lisvarrinane GWD (IE_SE_G_091) and the south by the Clonmel GWD (IE_SE_G_040). The valley floor is generally flat to gently undulating.

The rocks have undergone at least one major phase of structural deformation. The Kiltorcan sandstone has in other parts of South Tipperary reacted in a brittle manner to the deformation, allowing the development of a denser network of fracturing and fractures permeability than in the shalier sandstones elsewhere in the aquifer. Although major faults may not be mapped it is most likely that they exist on a smaller scale.

Results of aquifer testing undertaken in the aquifer are very variable. Daly (1985) reports estimates of 5 m^2/day to 1850 m^2 /day and suggests that the highest values are likely to be associated with low-lying areas close to anticlines or faults. Geophysical borehole logging data suggest that significant water movements occur at depths of over 60m where the aquifer is not confined by overlying shaly limestones. Where confined, active groundwater circulation is expected to be much more limited, but some deep flow has been inferred from mineral exploration boreholes at depths of over 200m (Daly, 1985). There is no obvious discharge zone for groundwater moving at depth in this aquifer, but it probably flows via large faults and complex pathways into shallower groundwaters and from there to surface water bodies where outcrop areas are the lowest elevations.

Because of the large area of rock close to surface and the overlying impermeable rock, most recharge may be point. There is likely to be orographic rainfall to the south of the mountains and

therefore more recharge in the south. According to the GSI (2019) the balance of abstraction with recharge will require careful attention, particularly if considering portions of the aquifer which are confined and/or which occur as isolated faulted blocks. The rivers have relatively high specific baseflows.

5.5.2 Recharge

Recharge is the amount of rainfall that replenishes the aquifer. It is a function of the effective rainfall, the permeability and thickness of the subsoil and the aquifer characteristics. Effective rainfall is the amount of precipitation that is actually added and stored in the soil, while the remaining precipitation is lost to evapotranspiration. The GSI National Recharge Map indicates that the effective rainfall for the site is 521 mm/yr. The recharge coefficient is 85%, which means that potentially 15 % (78 mm/yr) of effective rainfall translates to runoff.

5.5.3 Groundwater Vulnerability

Aquifer or groundwater vulnerability is a relative measure of the ease with which the groundwater could be contaminated by human activity and depends on the aquifer's intrinsic geological and hydrogeological characteristics. The vulnerability is determined by the permeability of any overlying deposits. For example, bedrock with a thick, low permeability, clay-rich overburden is less vulnerable than bedrock with a thin, high permeability, gravelly overburden.

The GSI uses five groundwater vulnerability categories – Extreme rock at or near surface or karst (X), Extreme (E), High (H), Moderate (M) and Low (L) for mapping purposes and in the assessment of risk to ground waters. The classifications are based on the thickness and permeability of the sub-soils overlying the aquifer.

Depth to rock	Hydrogeological Requirements for Vulnerability Categories				
	Diffuse recharge			Point Recharge	Unsaturated Zone
	high permeability (*sand/gravel*)	Moderate permeability (*sandy subsoil*)	low permeability (*clayey subsoil, clay, peat*)	(*swallow holes, losing streams*)	(*sand & gravel aquifers only*)
0–3 m	Extreme	Extreme	Extreme	Extreme (30 m radius)	Extreme
3–5 m	High	High	High	N/A	High
5–10 m	High	High	Moderate	N/A	High
>10 m	High	Moderate	Low	N/A	High

i N/A = not applicable.
ii Release point of contaminants is assumed to be 1–2 m below ground surface.
iii Permeability classifications relate to the engineering behaviour as described by BS 5930.
iv Outcrop and shallow subsoil (i.e. generally <1.0 m) areas are shown as a sub-category of extreme vulnerability.

(amended from Deakin and Daly (1999) and DELG/EPA/GSI (1999))

Figure 5.3. Groundwater Vulnerability Classification System (GSI, 2019)

The GSI has classified the vulnerability of the aquifer underlying the west of the site as High at Cahir Abbey.

5.5.4 Groundwater Abstractions

No abstractions are mapped on the proposed site. The are no groundwater abstractions mapped on the GSI Spatial Resources Viewer within the wider area. The nearest abstraction point is located over 26km SSW of the site at Ballyduff. It should be noted that registration of abstractions is not mandatory with the GSI and there may be abstraction points closer to the site which are not registered. There are a number of groundwater wells and springs. These are listed in **Table 5.2**. The conclusion of this search is that well yields from this aquifer are poor within 2km of the site.

Table x. Summary of groundwater abstractions in the region.

Well & GSI ID	Distance from the site	Depth (m)	Yield (m3/d)	Comments
Borehole (2011NWW013)	1.7 NE	28.6	33	Domestic use only
Borehole (2011NWW022)	2.0 E	33.5	33	Domestic use only
Borehole (2011NWW023)	2.3 SE	37.8	22	Domestic use only
Borehole (2011NWW031)	2.8 SSE	21.3	27	Domestic use only
Borehole (2011NWW032)	2.5 km S	33.5	33	Domestic use only

5.5.5 Groundwater Quality

The groundwater bodies associated with the Suir (SC_100) sub-catchment i.e. Cahir and Clonmel GWD are classified as 'Good' for water quality in the 2010-2015 monitoring period, under the requirements of the EU Water Framework Directive. No specific water quality data is available for the site.

5.5.6 Areas of scientific interest

There are no environmental designations located within the study area. Thus, the site of the proposed development does not form part of any Natural Heritage Area (NHA), Special Protection Area (SPA), Special Area of Conservation (SAC) or candidate Special Area of Conservation (cSAC), Nature Reserve, or National Park. The Lower River Suir SAC is located located 160m south-southeast. No direct hydrological connection to this site has been identified.

The following proposed NHAs, are located in the vicinity of the proposed development:

- Cahir Park Woodland (Site Code: 001579) located approximately 2.2 km south
- Rockwell College Lake (Site Code: 000970) located approximately 8.2 km north-northeast
- Quarryford Bridge (Site Code: 001526) located approximately 8.1 km north

- Scaragh Wood (Site Code: 000971) located approximately 2.0 km west-southwest
- Galtee Mountains (Site Code: 000646) located approximately 8.1 km west
- Shanbally Wood (Site Code: 000972) located approximately 12.7 km southwest
- Bansha Wood (Site Code: 002043) located approximately 12.3 km northwest
- Marlfield Lake (Site Code: 001981) located approximately 12.3 km east-southeast
-

There is no relevant connectivity with these sites and there are no other conservation sites with biological connectivity to the subject site that would be affected by the proposed project.

5.6 Potential impacts

The applicant seeks planning permission to construction a karting track and associated infrastructure. This will require some limited excavation however no material will be removed off site. Risks to groundwater, which are considered minimal, include leaks of hydrocarbons and excess silt in surface water run-off. As the karts run on gas no significant risk from the operation of the site have been identified. The impacts of the development and mitigation measures that will be put in place to eliminate or reduce them are detailed below.

Loss of soil or bedrock
The area for which development is proposed has been highly modified and all excavated material will be reused on site. Excavation will be minimal. The loss of soil and bedrock is classified as a minor impact.

Impacts on groundwater
The use of hydrocarbons creates the potential for spillages or leaks to migrate down into soil, bedrock and groundwater beneath the site. Minor spills from construction vehicles can potentially lead to localised hydrocarbon contamination. The karts run on gas and existing car parking facilities will be utilised by customer. No storage of hydrocarbon fuels will be required. Wastewater will be directed to the local authority sewer. Testing indicates that the site is ideally suited to an infiltration system to cater for surface water.

Potential impacts on surface water
There are no drains, rivers or streams in proximity the proposed development and the risk to surface water is considered very low. Although silt levels may be increased in surface run-off at the periphery of the site, no sensitive aquatic receptors including the Lower River Suir SAC will be affected.

Do Nothing' Scenario
The 'Doing Nothing' impact would result in no development at the site and the continued use of the land for industrial purposes and the existing road.

Cumulative Impacts
No significant cumulative impacts have been identified given the limited potential for impacts on a highly modified site and the use of gas-powered karts and existing car parking.

Worst Case Scenario Impact
In terms of land and soils/geology the 'Worse Case Scenario' environmental impact would be the accidental loss of fuel from construction machinery. This would impact on the soil quality which could, if left unmanaged, impact on the water quality of the aquifer under the site and may result in contaminated surface water runoff or groundwater base flow. In either case the potential volume of fuel loss would be relatively small in the 10's rather than 100's of litres and the duration of the impact would be temporary to short term.

5.7 Mitigation

A range of standard mitigation procedures will be employed during construction phase to prevent potential for impacts on water quality. No impediments to the effective implementation of these measures has been identified. A Construction, Environmental and Management Plan (CEMP) will be prepared prior to the commencement of works which will also include conditions of planning where relevant.

5.8.1 Construction measures – guidelines

All personnel involved with the project will receive an on-site induction relating to operations, to re-emphasize the precautions that are required as well as the mitigation to be implemented. Site managers, foremen and workforce, including all subcontractors, will be suitable trained in pollution risks and preventative measures.

Construction best practice measures will be implemented throughout the project, including the preparation and implementation of detailed method statements. The works will incorporate the relevant elements of the guidelines outlined below:

- E. Murnane, A. Heap and A. Swain. (2006) *Control of water pollution from linear construction projects. Technical guidance (C648). CIRIA.*
- H. Masters-Williams et al (2001) *Control of water pollution from construction*
- *sites. Guidance for consultants and contractors (C532). CIRIA.*

All personnel involved with the project will receive an on-site induction relating to operations and the environmentally sensitive nature of Natura 2000 sites and to re-emphasize the precautions that are required as well as the precautionary measures to be implemented. All staff and subcontractors have the responsibility to:

- Work to agreed plans, methods and procedures to eliminate and minimise environmental impacts,
- Understand the importance of avoiding pollution on-site, including noise and dust, and how to respond in the event of an incident to avoid or limit environmental impact;
- Respond in the event of an incident to avoid or limit environmental impact;
- Report all incidents immediately to their line manager;

- Monitor the work place for potential environmental risks and alert the immediate line manager if any are observed; and
- Co-operate as required, with site inspections.

5.7.2 Mitigation surface and ground water

Excavation dewatering

Where excavation occurs and in the unlikely event that there is a resulting need to dewater the excavation, this water will be treated via a settlement tank or pond. This water can then be discharged to the storm water system with a suspended solids discharge limit of 25mg/l.

5.7.3 Sediment Control

Soil Stripping

- The timing of the construction phase soil stripping and excavation works will take account of predicted weather, particularly rainfall.
- Earth movement activities will be suspended during periods of prolonged rainfall events.
- Any earthworks material will be placed and compacted in layers to prevent water ingress and degradation of the material.
- Any stockpiles of stripped topsoil will be in locations with minimum trafficking to prevent damage and dusting. It is noted that very little excavation is required.
- Prior to, or as part of initial construction activities for the project, any waste material within the development area will be removed accordance with best practices.
- In the event that petroleum contaminated soils or subsoils containing other potentially contaminated material are discovered during excavation activities (identified through staining, discoloration, or odour), this material is to be segregated, stockpiled, sampled for characterisation purposes sufficient to meet the requirements of the applicable disposal facility, transported off- site by a licensed transporter, and disposed of in an approved treatment or disposal facility.
- Stockpiles of stripped topsoil will be in locations with minimum trafficking to prevent damage and dusting It is noted that very little excavation is required.
- Stockpiled sub-soils will be located at suitably sheltered areas to prevent erosion or weathering and shall be shaped to ensure rainfall does not degrade the stored material
- Where unsuitable material is encountered this will be stockpiled separately and removed in accordance with a Site Waste Management Plan. It is noted that very little excavation is required.
- Stockpiles will be located away from drainage systems.
- All excavated materials from the site or introduced materials for construction will be either used or removed from the site.
- No permanent spoil or stockpiles will be left on site

5.7.4 Plant and refuelling

- Refuelling of construction vehicles will be carried out off site.

- To reduce the potential for oil leaks, only vehicles and machinery will be allowed onto the site that are mechanically sound. An up to date service record will be required from the main contractor.
- Should there be an oil leak or spill, the leak or spill will be contained immediately using oil spill kits; the nearby dirty water drain outlet will be blocked with an oil absorbent boom until the fuel/oil spill has been cleaned up and all oil and any contaminated material removed from the area. This contaminated material will be properly disposed of in a licensed facility.
- The project manager will be immediately informed of the oil leak/spill, and will assess the cause and the management of the clean-up of the leak or spill. They will inspect nearby drains for the presence of oil, and initiate the clean-up if necessary.
- Immediate action will be facilitated by easy access to oil spill kits. An oil spill kit that includes absorbing pads and socks will be kept at the site compound and also in site vehicles and machinery.
- Correct action in the event of a leak or spill will be facilitated by training all vehicle/machinery operators in the use of the spill kits and the correct containment and cleaning up of oil spills or leaks.
- In the event of a major oil spill, a company who provide a rapid response emergency service for major fuel spills will be immediately called for assistance, their contact details will be kept in the site office and in the spill kits kept in site vehicles and machinery.
- Fuel containers will be stored within a secondary containment system e.g. bund for static tanks or a drip tray for mobile stores.
- Collision with oil stores will be prevented by locating oils within a steel container in a designated area of the site compound away from vehicle movements.
- The volume of leakages will be prevented through monitoring oil storage tanks/drums for leaks and signs of damage.
- Long term storage of waste oils will not be allowed on site.
- On-site washing of concrete truck barrels will not be allowed. Machinery including hand-tools will never be washed in watercourses or drainage ditches.

5.7.5 Mitigation during operation

- The surface water drainage system will be maintained to keep it operational,
- Any chemicals stored on site will be appropriately stored.

5.8 Residual Impacts

The potential residual impacts are those that will occur after the proposed mitigation measures have taken effect. No significant residual impacts are predicted for land and soils/geology or surface/ground water. The mitigation measures described will further reduce the potential for any significant brief to temporary or short-term impacts occurring during construction. There are no residual operational phase impacts anticipated.All identified impacts have a residual environmental impact rating of imperceptible.

6. Material assets

6.1 Introduction

The Draft Advice Notes for Preparing Environmental Impact Statements produced by the EPA in notes that "Resources that are valued and that are intrinsic to specific places are called ‘material assets’. They may be of either human or natural origin and the value may arise for either economic or cultural reasons."

The assessment objectives vary considerably according to the type of assets, those for economic assets being concerned primarily with ensuring equitable and sustainable use of resources. Assessments of cultural assets are more typically concerned with securing the integrity and continuity of both the asset and its necessary context.

Material assets in the context of this chapter refers to the physical resources in the environment of human origin, as those of a natural origin are addressed elsewhere in the EIAR. The objective of the assessment is to ensure that these assets are used in a sustainable manner, so that they will be available for future generations, after the delivery of the proposed development.

6.2 Methodology

The following resources were used in compiling this chapter of the EIAR:

- County Tipperary Local Development Strategy 2014-2020 (2016)
- Cahir Local Area Plan (2011)
- A desktop study using published archaeological and historical studies and cartographic source;
- Envision EPA Air Mapping

6.3 Receiving environment

Cahir, with an approximate population of 3,600, is the only settlement in the immediate study area. The immediate local landscape is urban in character. Cahir town is located in the Urban Fringe as categorized by Tipperary Draft Landscape Character Assessment (2016). These towns represent the largest settlements of the county and due to their size relative to the smaller county settlements, they are considered to have an urban character that sets them apart from the surrounding rural hinterland.

The landscape around Cahir is dominated by two major geographical features; the River Suir and the Galtee Mountains. The *Tipperary Draft Landscape Character Assessment* (2016) categorises the lands to the north, east and south of Cahir town as ‘River Suir Central Plain’. The landscape is characterised by wide rolling vistas with large fertile fields, surrounded by dense hedgerows.

This low lying, undulating landscape forms the vast central area of Tipperary county, where it is associated with the River Suir. The lands to the west of Cahir form part of the 'Galtee Mountains Mosaic'. This upland area is dominated by moorland, forestry and marginal pasture.

6.4 Proposed development

The proposed development will impact on lands under the ownership of Buttimer Engineering Ltd. With the exception of a slight increase in traffic, there will be no roads impacted and no new roads or paths constructed for the proposed development.

6.5 Potential impacts

During construction, potential impacts may include:

- Increased vehicle movements associated with construction staff and management travelling to / from the site.
- Increased vehicle movements consisting of HGVs and construction plant that may result in traffic congestion on roads.
- Increased queuing and congestion.
- Increased conflict between pedestrians / cyclists and vehicle traffic.

The greatest potential impact on air quality is during the construction phase of the proposed development from construction dust emissions and the potential for nuisance dust. The implementation of suitable mitigation measures as outlined in the **chapter 9** will ensure any impacts are minimised.

There will be a minor short-term increase in noise during construction which will have a localised minor impact. The assessment indicates that noise emissions from karts using the proposed track will give rise to noise levels at noise sensitive locations (NSLs) which do not exceed the 55 dB daytime criterion or 45 dB evening criterion. Levels will also be lower than existing LAeq 15 min levels and LAF90 15 min levels at NSLs.

In the area zoned tourism and recreation to the east, predicted levels will also be lower than ambient LAeq 15 min levels, and generally less than LAF90 15 min levels. LAF90 15 min levels at the western and southwestern fringes of the zoned area will be marginally exceeded as 2200 h approaches. Existing levels deeper in the zoned area are unlikely to be exceeded at any time.

6.6 Mitigation

Specific measures have been integrated into the construction proposals to avoid or reduce environmental impacts, which might otherwise occur. A summary of these controls are outlined below.

A Construction Traffic Management Plan will mitigate traffic impacts. The impacts of construction traffic will be temporary, with traffic levels returning to existing numbers upon completion of construction.

Retention of planted vegetation will minimise the impact on landscape.

No significant impacts on air are predicted to occur.

6.7 Residual impacts

the proposed development will not result in a significant increase in demand for major utilities i.e. clean water, public sewer capacity and power. There will be no loss of agricultural land following completion. Given the scale and nature of the proposed development it will not adversely impact on soil quality or stability.

The proposed development will not adversely impact on ambient air and water quality. There will be a temporary increase in traffic and traffic disruption during construction along the public road, however this will be a short-term, minor and localised, and impacts will be minimised by the implementation of an appropriate Traffic Management Plan. Once operational there will be no significant impact on traffic and transportation. No significant impact on recreational use of the area will occur.

Overall it is concluded that there will be short-term minor impacts during the construction phase of the development, however the long-term residual impacts will be negligible.

7. Air quality & climate

7.1 Introduction

This EIAR chapter identifies, describes and assesses the likely impacts on ambient air quality from the proposed development during constructions and operation. The primary issues with respect to potential impacts on climate and air quality are dust emissions and vehicle emissions.

7.2 Methodology

This report was prepared by Carl Dixon MSc. As a founding partner of DixonBrosnan Environmental Consultants, Carl has over 20 years of experience in environmental consultancy including detailed assessments and background monitoring for air quality. Projects include landfills (Derryconnell, Benduff, Kilbarry, Bottlehill) industrial facilities (Stauntons Foods Ltd, Haulbowline Remediation Project etc) and quarries (Gleeson Concrete, Quirke's Quarries, Mid Cork Quarries etc). The desk based study comprised a review of the Met Éireann Meteorological Database (www.met.ie). Given the minimal potential for significant impacts on air quality or climate, no specialised surveys were considered necessary.

7.3 Receiving environment

7.3.1 Climate

Ireland ratified the United Nations Framework Convention on Climate Change (UNFCCC) in April 1994 and the Kyoto Protocol in 1997. For the purposes of the EU burden sharing agreement under Article 4 of the Kyoto Protocol, Ireland agreed to limit the net anthropogenic growth of the six GHGs under the Kyoto Protocol to 13% above the 1990 level over the period 2008 to 2012. The Paris Agreement was established at COP21 in Paris 2015 and is an important milestone in terms of international climate change agreements. The "Paris Agreement", agreed by over 200 nations, has a stated aim of limiting global temperature increases to no more than 2°C above pre-industrial levels with efforts to limit this rise to 1.5°C. The aim is to limit global GHG emissions to 40 gigatonnes as soon as possible whilst acknowledging that peaking of GHG emissions would take longer for developing countries. Contributions to greenhouse gas emissions would be based on Intended Nationally Determined Contributions (INDCs) which would form the foundation for climate action post 2020. Significant progress was also made on elevating adaption onto the same level as action to cut and curb emissions.

In Ireland a National Programme for the progressive reduction of emissions of these four transboundary pollutants has been in place since April 2005. Data available from the EU in 2010 indicated that Ireland complied with the emissions ceilings for SO_2, VOCs and NH_3 but failed to comply with the ceiling for NO_X Directive (EU) 2016/2284 "On the Reduction of National Emissions of Certain Atmospheric Pollutants and Amending Directive 2003/35/EC and Repealing Directive 2001/81/EC" was published in December 2016. In relation to Ireland, 2020-29 emission targets are for:

- SO_2 -65% below 2005 levels
- NO_X -49% reduction
- VOCs -25% reduction
- NH_3 -1% reduction
- $PM_{2.5}$ -18% reduction)

In relation to 2030, Ireland's emission targets are for:

- SO_2 -85% below 2005 levels
- NO_X -69% reduction
- VOCs -32% reduction
- NH_3 -5% reduction
- $PM_{2.5}$ -41% reduction

In relation to the EU 2020-29 targets for CO_2, Ireland has a target of a 20% reduction in non-Emission Trading Scheme (non-ETS) greenhouse gas emissions by 2020 relative to the 2005 levels. The EPA confirmed that the 2015 levels are on target but that projections for 2016 – 2020 indicate that the target is unlikely to be met. The proposed development will have a negligible impact on air emissions.

7.3.2 Local weather conditions

Weather conditions, particularly precipitation and wind factors, will significantly affect dust generation and deposition. Wind speed and direction determine the level of dust entrainment and the direction of dispersion. Significant levels of precipitation can effectively suppress dust formation at source, while calm weather will effectively prevent dispersion of dust.

The Atlantic Ocean is a dominant influence on local weather, resulting in mild, moist conditions dominated by maritime air masses. The prevailing wind direction in Ireland is from the west-southwest quarter, such winds from the Atlantic frequently bring rain. Easterly winds are weaker and less frequent and tend to bring cooler weather from the northeast in spring and warmer weather from the southeast in summer.

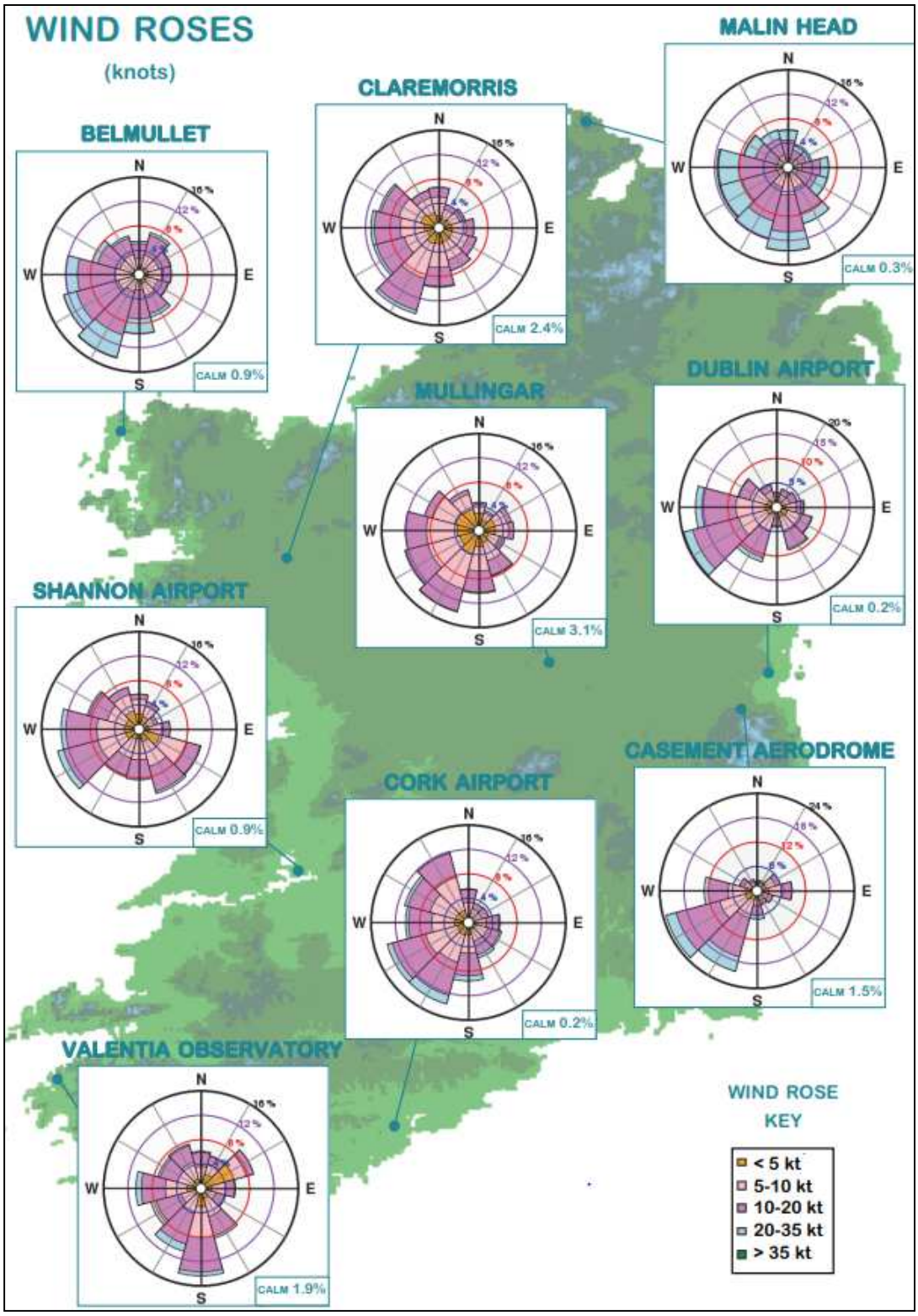
The nearest constantly monitored meteorological station to the proposed development is the Met Éireann Station is Cork Airport which lies approximately 69km southwest of the proposed development. The 30-year averages from the station at Cork Airport are presented in **Table 7.1**. It should be noted that Moorpark, Fermoy meteorological station is nearer, (approximately 32km southwest). However, this station has only been operational since 2003 and therefore long-term data are not available.

Table 7.1: 30-year Average Meteorological Data from Cork Airport (Annual Values from 1981- 2010).

Parameter	30-year Average
Mean Temperature (0 C)	12.9
Mean Relative Humidity at 0900UTC (%)	86.7
Mean Daily Sunshine Duration (hours)	3.9
Mean Annual Total Rainfall (mm)	1227.9
Mean Wind Speed (knots)	10.5

The prevailing wind direction is from the west and south west as indicated in the windrose for Cork Airport Meteorological Station (**Figure 7.1**). Easterly winds tend to be infrequent. Wind characteristics are variable, from moderate breezes to gales (average 10.8 days with gales per annum). Monthly average wind speeds range from 9.03 to 12.1 knots with highest wind speeds occurring during December and January and lowest wind speeds were recorded in the June, July and August period. Dust deposition during construction will typically occur during dry spells with medium to strong breezes (>11.2 knots). It follows that the potential for fugitive dust emissions is greatest during the summer months. Due to the predominant south-westerly winds, receptors located to the north east are most likely to experience elevated dust levels.

Figure 7.1: Windrose For Cork Airport Met Station (Source: www.met.ie) 1981-2010 Averages.



7.3.3 Air quality

The main substances which are of interest in terms of existing air quality are sulphur dioxide, nitrogen oxides (nitric oxide, NO and nitrogen dioxide NO_2, collectively referred to as NO_x), fine particulate matter including PM_{10} and $PM_{2.5}$ which could originate from combustion sources, traffic and the existing commercial activities in the area. Vehicle emission standards are tightened every five years or so which has resulted in a steady decrease in emissions of oxides of nitrogen, carbon monoxide, hydrocarbons and particles.

Particulate matter is made up of tiny particles in the atmosphere that can be solid or liquid and is produced by a wide variety of natural and manmade sources. Particulate matter includes dust, dirt, soot, smoke and tiny particles of pollutants. Particulate matter of 10 microns in aerodynamic diameter or less are also referred to as PM_{10}. Similarly, $PM_{2.5}$ refers to particulate matter of 2.5 micrometers or less in aerodynamic diameter. In the past domestic coal burning was a major source of particulate matter in Irish cities during winter months. Levels of particles have decreased significantly since then following the introduction of abatement strategies including Special Control Areas and other Regulations regarding the use, marketing, sale and distribution of certain fuels. The significance of particulate matter is predominantly related to human health and respiratory effects.

Nitrogen oxides are generated primarily by combustion processes. The main anthropogenic sources are mobile combustion sources (road, air and traffic) and stationary combustion sources (including industrial combustion). The main source of nitrogen oxides in the vicinity of the site is traffic. The significance is health-related for nitrogen dioxide (NO_2) and ecological for nitrogen oxides (NO_x).

Sulphur dioxide also originates from combustion but predominantly from heating sources and not traffic. The trend in ambient SO_2 concentrations in Ireland is clearly downward and this pollutant is not a matter for concern in Ireland. This reduction can be attributed to fuel switching from high-sulphur fuels, such as coal and oil, to natural gas and to decreases in the sulphur content of oil.

Carbon monoxide (CO) is a colourless and odourless gas, formed when carbon in fuel is not burned completely. It is a component of motor-vehicle exhaust, which accounts for most of the CO emissions nationwide. Consequently, CO concentrations are generally higher in areas with heavy traffic congestion.

Emissions during operation will be negligible. The primary issue with respect to this proposed development is the potential for fugitive dust emissions during construction works or from increased visitor traffic during operation. Dust in rural areas is generally derived from the movement of wind over dry ground and can arise from a range of activities including agriculture, road traffic, construction works and vehicular movements on unpaved and/or paved roads. As the works will take place within an industrial park within an urban area, there are unlikely to be any significant changes to background dust levels.

Under the Framework Directive on Air Quality (1996/62/EC), Ireland has been divided into four air management areas. As can be seen from **Table 7.2**, Dublin is defined as Zone A and Cork as

Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000 is defined as Zone D.

The proposed development is thus classed as 'Zone D' under Directive 2008/50/EC on ambient air quality and cleaner air for Europe (2008). There are no point air emission sources of significance in the vicinity of the study site. While lands in the immediate vicinity are urban/light industrial, the greater Cahir area is dominated by agricultural land use. The air quality with the area is identified as being of "good" quality.

Table 7.2: Air Quality Index for Health Regions.

AQIH Region	Definition	Comparison with Air Quality Management Zone
Dublin City	Dublin agglomeration from Shankill in south Dublin to Lucan in west Dublin to Swords in north Dublin.	Corresponds to Zone A
Cork City	Cork agglomeration incorporating Cork City Council jurisdiction with additional built-up areas.	Corresponds to Zone B
Large Towns	Towns and cities with a population greater than 15,000 (excluding Dublin and Cork).	Corresponds to Zone C
Small Towns	Towns and cities with a population between 5,000 and 15,000.	Corresponds to part of Zone D
Rural West	Towns with population less than 5,000, villages and rural areas in Counties Clare, Cork, Donegal, Galway, Kerry, Leitrim, Limerick, Mayo, Roscommon and Sligo.	Corresponds to part of Zone D
Rural East	Towns with population less than 5,000, villages and rural areas in Counties Carlow, Cavan, Dublin, Kildare, Kilkenny, Laois, Longford, Louth, Meath, Monaghan, Offaly, Tipperary, Waterford, Westmeath, Wexford and Wicklow.	Corresponds to part of Zone D

7.3.4 Receptors

There are a number of dwellings scattered along the R640, existing businesses within the industrial park and Cahir Abbey House, which can be considered as sensitive receptors with

respect to dust. No other receptor types which could be considered highly sensitive such as hospitals, nursing homes, hi-tech industries etc. are present.

7.4 Predicted impacts

7.4.1 Construction phase

During the construction phase there will be work involving construction machinery and vehicles which have the potential to generate fugitive windblown dust and exhaust emissions. Construction traffic to and from the site will result in a short-term increase in the volume of traffic along the local road network which will generate additional hydrocarbon and particulate emissions from the vehicle exhausts. It is noted however that very little excavation will be required.

In general, the emissions of primary concern relate to dust generation and the potential for impacts on sensitive receptors outside the site boundary. **Table 7.3** provides a list of distances within which dust could be expected to be a nuisance from construction sites. Potential nuisance effects include soiling, PM_{10} deposition and vegetation effects. The effect of dust arising from stripping of overburden, processing and vehicle movement is primarily one of nuisance caused to the local community. There is also the potential for ecological impacts via deposition on vegetation which can disrupt sensitive plant communities if severe. Dust nuisance is experienced usually as a result of dust deposition upon clean surfaces such as windows, cars, furniture or laundry. The data in **Table 7.3** is taken from **Appendix 7.7** of the National Roads Authority's (NRA) *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes*.

Table 7.3: NRA Assessment Criteria for the Impact of Dust Emissions from Construction Activities with Standard Mitigation in Place Source Potential Distance for Significant Effects (Distance from source).

Source		**Potential Distance for Significant Effects (Distance from source)**		
Scale	Description	Soiling	PM_{10}	Vegetation effects
Major	Large construction sites, with high use of haul roads	100m	25m	25m
Moderate	Moderate construction sites, with moderate use of haul roads	50m	15m	15m
Minor	Minor construction sites, with limited use of haul roads	25m	10m	10m

This proposed development is considered similar to a minor construction site with moderate use of haul roads. Therefore, with standard mitigation measures in place, soiling effects could occur up to 25 m and PM_{10} deposition and vegetation effects will occur to 10 m.

The additional traffic generated due to the construction of the proposed development may also lead to the release of air pollutants. The *UK Design Manual for Roads and Bridges (DMRB)* notes that if none of the roads in the network meet any of the traffic/alignment criteria outlined below or there are no properties or relevant Designated Sites near the affected roads, then the impact of the scheme can be considered to be neutral in terms of local air quality:

- Road alignment change of 5 metres or more;
- Daily traffic flow changes by 1,000 AADT or more;
- HDV flows change by 200 vehicles per day or more;
- Daily average speed changes by 10 km/h or more; or
- Peak hour speed changes by 20 km/h or more.

Based on the above criteria and given the scale and nature of the proposed development it can be concluded that it is not necessary to undertake a local air quality assessment as there is unlikely to be an air quality impact at nearby sensitive receptors as a result of traffic emissions. Construction traffic will give rise to minor CO_2 and NO_2 emissions, however due to short-term and temporary nature of these works, the impact on air quality and climate will not be significant.

There is the potential for fugitive dust emissions during construction. Due to the predominantly south-westerly winds, receptors located to the north east are most likely to experience elevated dust levels. It is noted that the large disused quarry to the east and north east provides a buffer which minimises the potential for impacts from fugitive dust emissions as indicated in **Figure 7.2.** The closest dwelling to the north east and east are located 758m and 610m respectively from the proposed development. At that distance impacts from fugitive dust emissions will be negligible.

Figure 7.1 Closest receptors to the east and north east.

To the south the closest receptor is Cahir Abbey House which is screened by existing walls. To the west dwellings are screened by the existing industrial estate and there are no dwellings in proximity to the site to the north. It is noted that winds from the north, south and east are less common and thus the potential for fugitive dust emissions are lower.

Best practice mitigation measures will be implemented during the construction phase which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction of the proposed development is likely to be short-term and imperceptible with respect to human health.

7.4.2 Operational Phase

Once construction is complete there will be additional traffic generated and hence a minor additional release of air pollutants. However, the increase will be minor and the operational phase of the development will not have an impact on climate. Impacts on climate could occur indirectly through electrical usage however, the CO_2 emissions from increased electricity and gas use associated with the project will not be significant in relation to Ireland's national annual CO_2 emissions. No dust emission or other significant impact on air quality will occur.

7.5 Mitigation measures

The control of fugitive dust emissions will ensure that there is no significant impact on sensitive receptors in the surrounding landscape. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the dust management plan. A complaints log would be maintained by the construction site manager and in the event of a complaint relating to dust nuisance, an investigation would be initiated. The key aspects of controlling dust are listed below:

- Avoiding unnecessary vehicle movements and manoeuvring and implementing limit speeds where necessary, to minimise the generation of airborne dust.
- During dry periods, dust emissions from heavily trafficked locations (on and off site) will be controlled by spraying surfaces with water and wetting agents.
- Hard surface roads will be swept to remove mud and aggregate materials from their surface.
- Dust from trucks entering or leaving the site will be prevented by limiting the speed of vehicles within the site to 10kmh and by use of a mechanical road sweeper.
- The overloading of tipper trucks exiting the site will not be permitted.
- Aggregates will be transported to and from the site in covered trucks.
- Where the likelihood of windblown fugitive dust emissions is high and during dry weather conditions, dusty site surfaces will be sprayed by a mobile tanker bowser.
- Exhaust emissions from vehicles operating within the construction site, such as HGV's excavators, or other plant equipment, will be controlled by the contractor by ensuring that emissions from vehicles are minimised by routine servicing of vehicles and plant, positioning of

exhausts at a height to ensure adequate local dispersal of emissions, and avoidance of engines running unnecessarily and the use of low emission fuels.

- All plant not in operation will be turned off and idling engines will not be permitted for excessive periods.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- Material stockpiles containing fine or dusty elements will be covered with tarpaulins.

7.6 Residual Impacts

Once the mitigation measures are implemented, there will be no residual impacts of significance on air quality or climate from the construction or operational phases of the proposed development.

8. Population & human health

8.1 Introduction

This chapter considers the impact of the proposed development in the context of population and settlement, land use, employment and other impacts of a social and economic nature. In terms of human beings, the types of issues which developments such as this raise (both during construction and operation) include: impacts on amenities and services in the area; additional economic opportunities; increased traffic; and impacts on existing land uses. In carrying out any development, one of the principal concerns is that human beings should experience no reduction in the quality of life as a consequence of the construction and occupational phases of a development.

Publications and other data sources that guided the preparation of this chapter are listed hereunder:

- The Central Statistics Office – data from the 2011 Census;
- County Tipperary Local Development Strategy 2014-2020 (2016)
- Cahir Local Area Plan (2011);
- *The Planning System and Flood Risk Management Guidelines for Planning Authorities'* DoEHLG 2009.

8.2 Existing environment

8.2.1 Land use

Land use in the immediate vicinity of the proposed development site is dominated by a mix of light industrial and residential land use and outside this zone land use is dominated by agriculture. The proposed development with thus will be proximate to a range of services e.g. residential, commercial, health services, industry, educational.

8.2.2 Population

In terms of the County, Region and State, population change is strongly influenced by migration and emigration rates, rather than birth and death rates. The 1990's and early 2000's saw a large movement of people into the Country due to the "economic boom" in Ireland. The past 10 years have seen a decline in economic growth and a return to emigration of people from Ireland.

Economic indicators show that this trend is again reversing and signals of demand for skilled workforce and economic growth are retuning. 2016 Census data indicates a small increase in the population of County Tipperary of just 799 between 2011 and 2016. The settlement pattern within the county is based on a strong network of towns and villages with service centres provided at strategic locations throughout the county. The total population of County Tipperary is 158,754 (CSO: 2011). The major towns of Clonmel (17,908 pop) and Nenagh (8,439 pop) are located at opposite ends of the county thus ensuring the potential for strong, social, economic and community linkages within the county and strong service centre regions. The towns of Thurles,

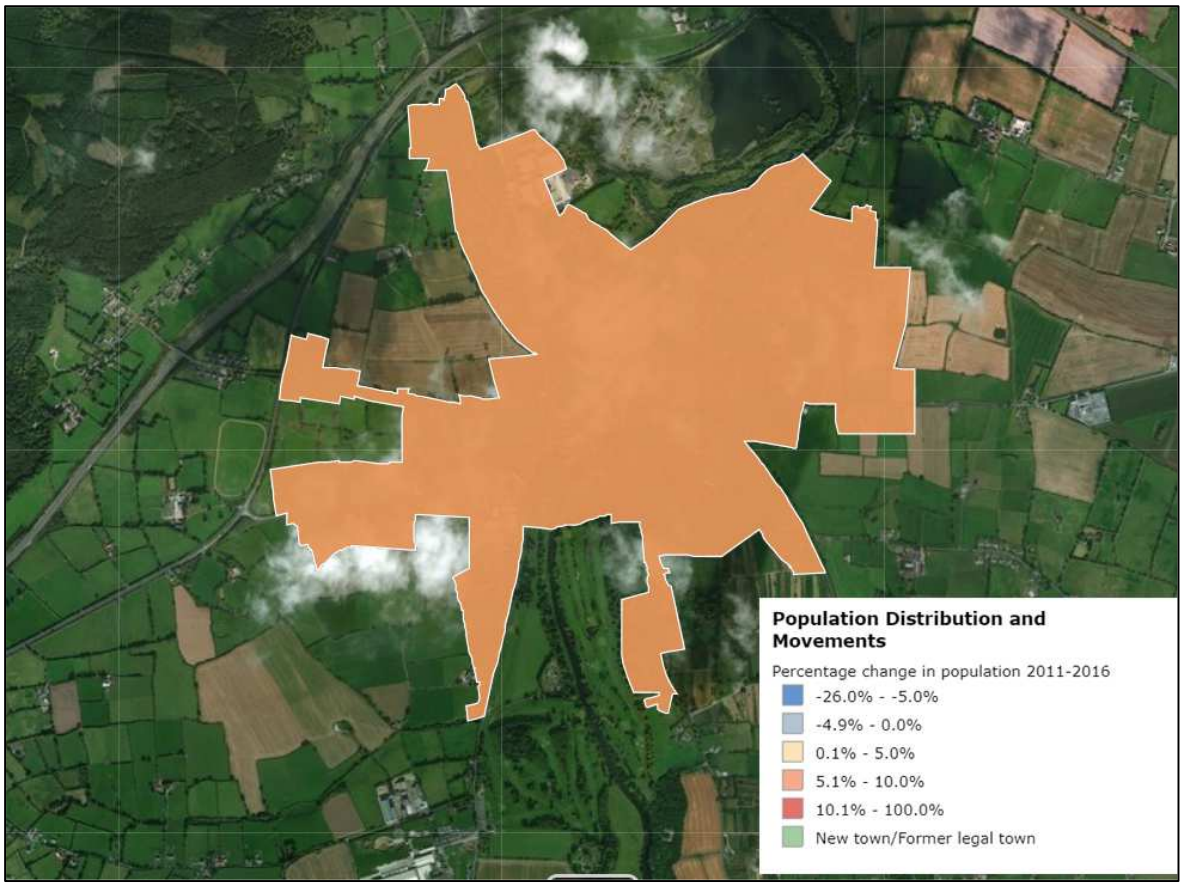
Roscrea, Tipperary, Carrick on Suir, Templemore, Cahir and Cashel function as service centres for their local hinterlands. The villages throughout the county provide services for the local communities and rural hinterlands.

As can be seen in **Table 8.1** the percentage population change within County Tipperary increased by 0.5%, whilst the town of Cahir experienced an increase of 0.4%. A population of 373 was recorded in April 2011, compared to a population of 381, recorded in April 2016. This is an increase of 15 persons. **Figure 8.1** shows the town of Cahir and the percentage growth experienced between 2011 and 2016.

Table 8.1 Percentage Population Change In Ireland's Cities And Towns 2011-2016.

Settlement Name	Population 2016	Population 2011	Population Change	Percentage Change between 2011 and 2016
Tipperary	159,553	159,754	799	0.5%
Cahir	3,593	3,578	15	0.4%

Figure 8.1 Percentage population change Cahir town 2011-2016.



8.2.3 Cahir Local Area Plan

The town of Cahir is was designated as a Secondary Service Centre in the *Tipperary County Development Plan 2009-2015* (2009). According to Cahir Local Area Plan 2011, the residential function of these service centres will be strengthened, retail/employment/heritage functions improved and their overall perception as desirable places to live and work will be promoted and enhanced. The Secondary Service Centres will provide supporting roles for Clonmel (in the south of the county) but, in the context of the settlement strategy, will adopt their own role as service centres offering an improved service provision in terms of retail, employment and community facilities to their own hinterlands. There are four such service centres in South County Tipperary, Cahir, Carrick-on-Suir, Tipperary town and Cashel.

8.2.4 Economic activity

The primary employment in Cahir are within the manufacturing sector at 25% with services such as tourism, and retail accounting for a further 13%. The largest manufacturing industries within the town are the AIBP Plant, Premier Pet Foods and Munster Proteins.

The Strategic Vision contained within the Cahir LAP is based on the role of Cahir as defined in national, regional and local planning policy and the aspirations of the people and stakeholders within Cahir as outlined in the Pre-Draft submissions/observations. The Vision Statement reads as follows;

"To continue to develop Cahir as a balanced settlement centred on a vibrant town centre, to facilitate and encourage the growth of Cahir as an area of tourism excellence, to harness the location and accessibility strengths of Cahir as a multi-modal interchange in the promotion of employment and industry, to promote the town as a unique settlement for working, living and recreation and to balance the demands of a vibrant economy with the need for a healthy and sustainable environment and to ensure the protection of the unique built and cultural heritage of the area".

8.2.5 Zoned lands

Lands have been zoned within the Cahir Local Area Plan for a number of uses including town centre, existing and new residential areas, an office development area, an integrated tourism venue, light industrial and employment areas as well as general industrial and amenity areas. **Figure 8.2** shows the proposed development in relation to zoning.

The proposed development site is located within an area zoned for *Light Industry and Employment*. Lands to the north and west are also within this zone. The proposed southern boundary runs adjacent to lands zoned *Agricultural*. The eastern proposed site boundary abuts land zoned as an *Integrated Tourism & Recreation Area*.

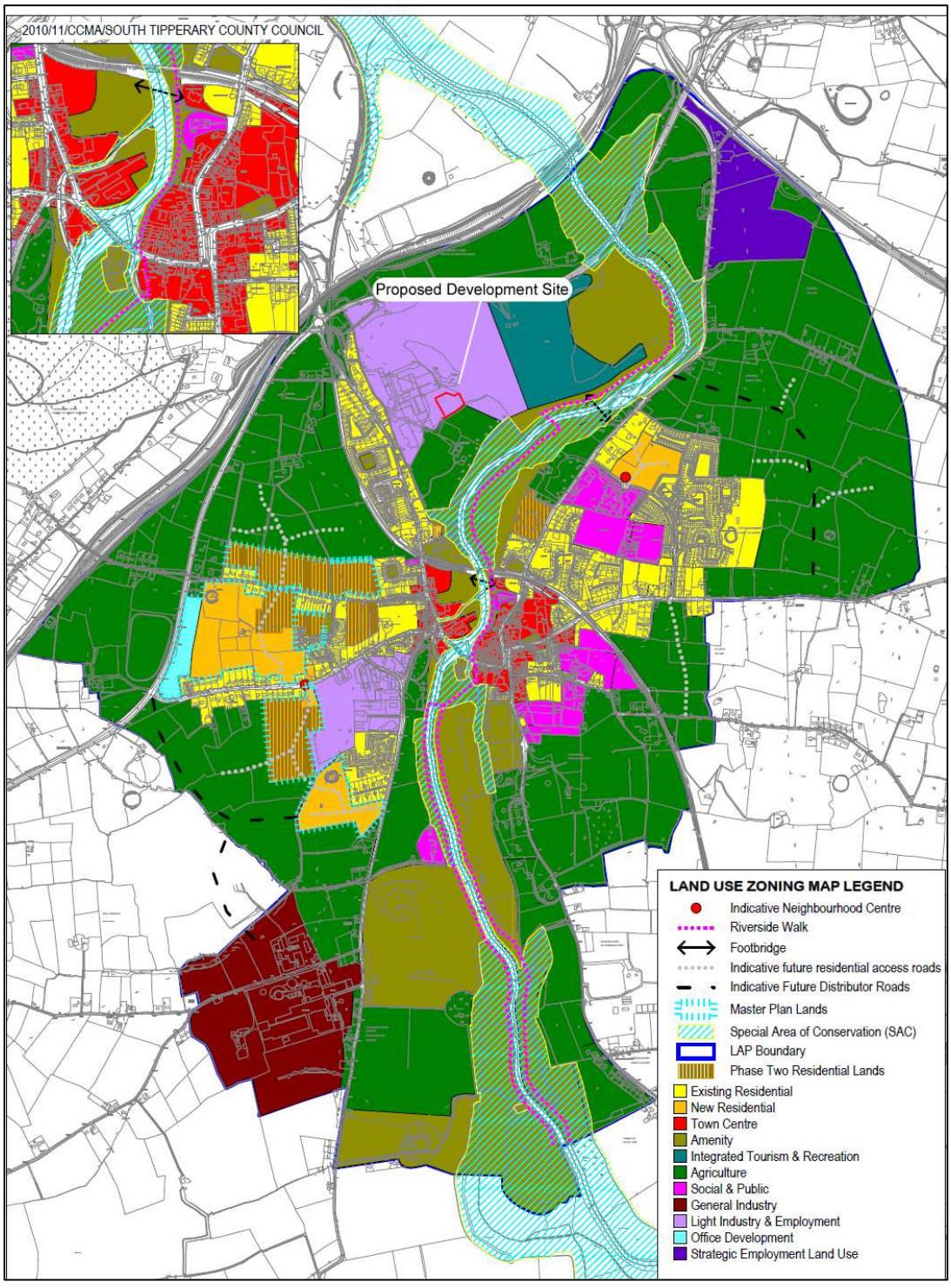


Figure 8.2 Local Area Plan - Zoned Land.

8.2.6 Natural disasters

The potential for natural disasters to influence the development was assessed. Flooding was considered to be the only relevant natural disaster to which the project may be vulnerable. Flooding can have the potential to cause significant impacts on development i.e. through damage to site infrastructure, disruption to normal operations and failure of onsite plant items and processes causing secondary environmental effects or even direct harm to human beings onsite. The risk of flooding is discussed in **Section 8.2.7**

8.2.7 Flood assessment

Geoenvironmental Environmental Consultants were commissioned by Howick O Brien Consultants on behalf of the applicant Buttimer Engineering to carry out a site-specific flood risk assessment in response to a request for further information received from Tipperary County Council.

8.2.7.1 Flood Risk Assessment Approach and CFRAM Program

A flood risk assessment is the identification, quantification and communication of flood risk using the source-pathway-receptor model. It examines the sources of flooding and the pathways by which floodwaters might reach receptors, such as people, property and the environment to determine the likelihood of them being affected by flooding. The Geoenvironmental report examined the flood hazards likely to arise and the vulnerability of receptors to such hazards. The report used the source-pathway-target paradigm to assess the flood risk. The assessment was desk based and therefore relied on available flood source information already.

CFRAM is ‘Catchment Flood Risk Assessment and Management’. The national CFRAM programme commenced in Ireland in 2011. The CFRAM Programme is central to the medium to long-term strategy for the reduction and management of flood risk in Ireland. The Office of Public Works (OPW) is the lead agency for flood risk management in Ireland and is the national competent authority for the EU Floods Directive. OPW works in close partnership with all Local Authorities in delivering the objectives of the CFRAM Programme. The CFRAMS study focuses primarily on developed areas and areas subject to significant development pressure known to have experienced flooding in the past or believed to be at risk of flooding in the future.

The CFRAM Programme comprises three phases:

- The Preliminary Flood Risk Assessment (PFRA): 2011
- The CFRAM Studies and parallel activities: 2011-2015
- Implementation and Review: 2016 onwards

8.2.7.2 Flood Risk Identification

Source Pathway Receptor Model

The Source-Pathway-Receptor (S-P-R) Model has become widely used to assess and inform the management of environmental risks. Flood risk assessments require identification and assessment of all three components:

- The probability and magnitude of the source (in this case high river levels within the nearby
- stream)
- The performance and response of pathways and barriers to pathways such as floodplain areas
- and flood defence systems; and
- The consequences to receptors such as householders and property owners

The ultimate aim of a flood risk assessment is to combine these components so that the consequences can then be analysed. Flood Risk Assessments (FRAs) need to consider the situation both as it is now and also how it might change in the future. Such consideration should include changes in climate (which impact largely on sources), the construction of flood protection or drainage schemes within the locality by others, the deterioration of existing and proposed defences. A desk top study and site inspection were undertaken as part of the Flood Risk Assessment. The desk top study entailed an examination of documentary and cartographic sources.

8.2.7.3 Sources of flood data

The primary source of flood risk information includes the following;

- Tipperary Co Co On-Line Maps
- County Development Plan & Local Development Plan
- OPW CFRAMS Maps
- OPW flood hazard website
- The Planning System and Flood Risk - Guidelines for Planning Authorities – Department of
- Environment, Heritage and Local Government & OPW 2009

8.2.7.4 Flood History at Cahir Abbey Business Park

There is no anecdotal information available from the OPW to suggest that the proposed development site represents a flood risk. The OPW Flood Hazard Map has recorded no history of flooding within the Cahir Abbey Business Park or anywhere close to the proposed development. Full details are available in **Appendix 8.1**.

8.2.7.5 Tipperary County Council On-Line Maps

A Flood risk map layer is available to view on the Tipperary County Council online mapping system. The information Councils online GIS mapping system at https://www.tipperarycoco.ie/planning. The extract from Tipperary County Council online maps completed by JBA Consulting shows the proposed development location outside of both the fluvial and pluvial flood risk areas indicating that the site is not at risk. There are areas further to the north within the business park shown to be potentially at risk of pluvial flooding. The map is shown in **Figure 8.3**.

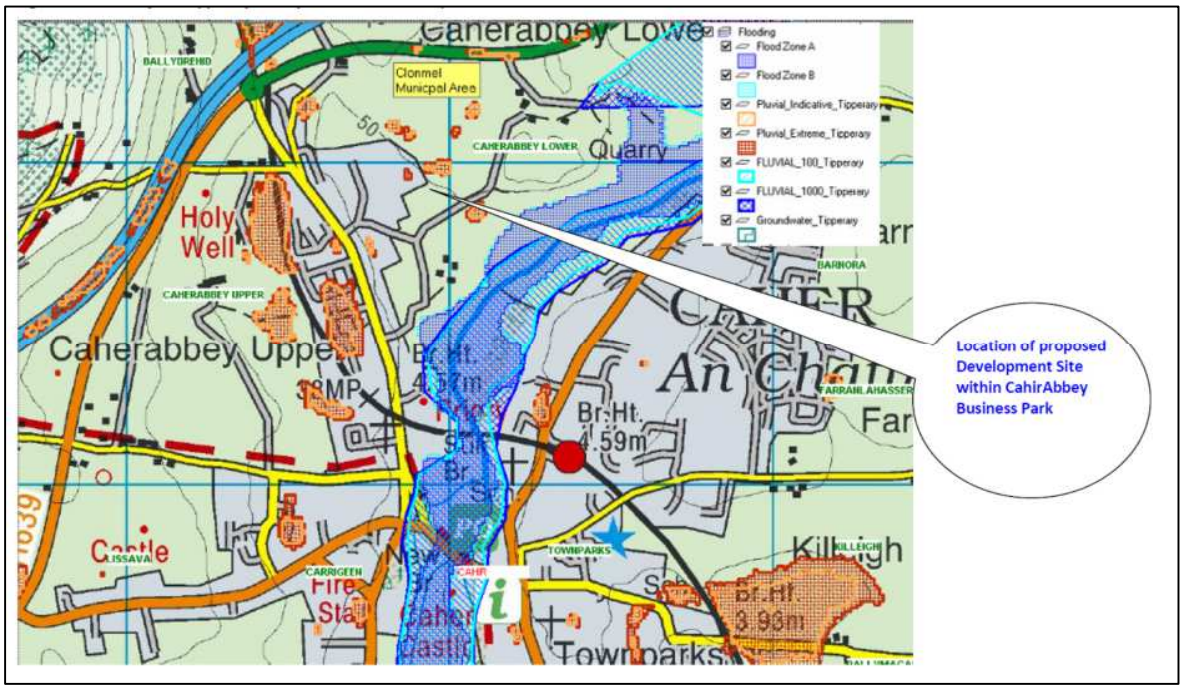


Figure 8.3. Extract from Tipperary County Council Online maps

8.2.7.6 OPW CFRAMS Maps

The OPW is the lead agency for flood risk management in Ireland and is the national competent authority for the EU Floods Directive. The OPW under its CFRAMs 'Catchment Flood Risk Assessment and Management' project is in the process of preparing Flood Risk maps and associated flood risk plans. The CFRAMS study focuses primarily on developed areas and areas subject to significant development pressure known to have experienced flooding in the past or believed to be at risk of flooding in the future.

Flood Risk Maps are being developed on behalf of the OPW by RPS Consultants. The maps are available to the public through the newly launched OPW website (www.floodinfo.ie). The maps illustrate the extent of areas likely to be impacted by flooding from detailed fluvial modelling of extreme discharge events in surrounding streams and rivers. The OPW Fluvial Flood Extents map predicts that part the development site within the Cahir Abbey Business Park will be at risk from an extreme fluvial event in the nearby watercourse located close to the entrance of the park.

The recently completed OPW CFRAMS maps site shows that part of the development site to be at risk from a Fluvial Event associated with the nearby stream. The highest risk is shown closer to the eastern boundary where the site is delineated to be at risk from a 1:10 yr event. The area where the karting track development is proposed is shown to be at risk from a 1:100 and 1:1000 year event with the far eastern section of the site outside of the flood risk. Area wide and a more detailed Flood Extent Map showing the proposed development site are set out in **Figure 8.4** and **Figure 8.5**.

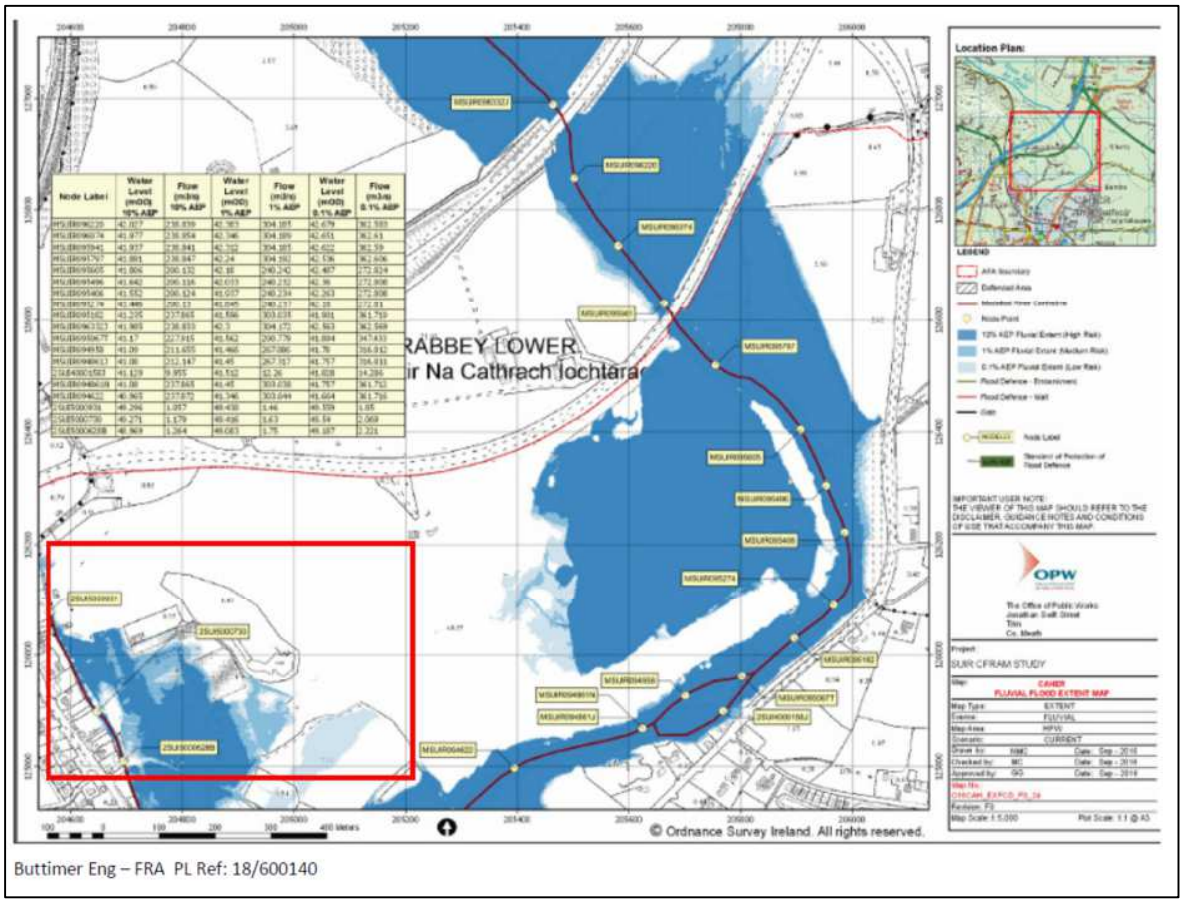


Figure 8.4. OPW CFRAMS Fluvial Flood Risk Map Extent

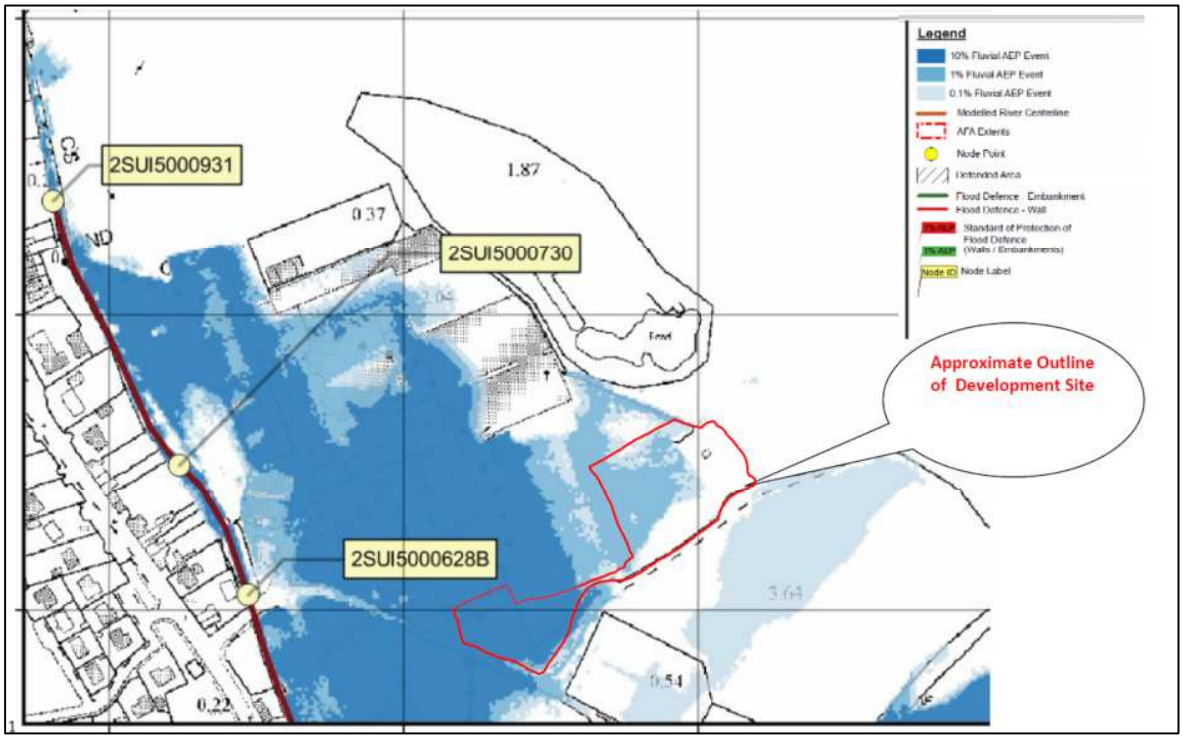


Figure 8.5. Extract from OPW CFAMS Fluvial Flood Risk Extent Map showing Proposed Development site

8.2.7.7 Flood Vulnerability Class

The Flood Risk Guidelines sets out the types of development that would be appropriate to comply with a Justification Test. The proposed karting track development in the Abbey Business Park falls under the category of Buildings used for retail, leisure, warehousing, commercial, industrial and non-residential institutions. The development is therefore categorised as less vulnerable that residential developments and would therefore seen as more acceptable in areas which may be more susceptible to flooding that more sensitive residential developments.

8.2.7.8 Flood Predictions and Stream Flood Discharge Calculations

Flood Forecasting

Flood frequency analyses are used to predict design floods for sites along a river. The technique involves using observed annual peak flow discharge data to calculate statistical information such as mean values, standard deviations, skewness, and recurrence intervals. These statistical data are then used to construct frequency distributions, which are graphs and tables that tell the likelihood of various discharges as a function of recurrence interval or exceedence probability. Flood forecasts are determined by examining past occurrences of flooding events, determining recurrence intervals of historical events, and then extrapolating to future probabilities. The term "a one-hundred year flood" is actually a misnomer. What is really meant by this term is a flood with recurrence interval of 100 years - one that has a 1% chance of occurring in any given year. Similarly the 1:1000 yr indicates a 0.1% change of occurring in any one year. a In the absence of

a hydrometric station within the river catchment the 1000 yr discharge volumes in the nearby Stream located close to the entrance to the business park study location were calculated using the methodology set out in the *Institute of Hydrology Report No. 124 (Flood Estimation for Small Catchments)*.

Catchment Description

The study stream has a catchment area of less than 5kms and therefore the area cannot be calculated using the EPA Hydronet tool. Instead the area is calculated by drawing a pologon around the stream using the topography of area to estimate the total catchment area of the stream. The calculated area of the stream to the study location at Cahir Abbey Industrial Estate is 0.560 sqm. The catchment area of the stream is shown in **Figure 8.6** below.

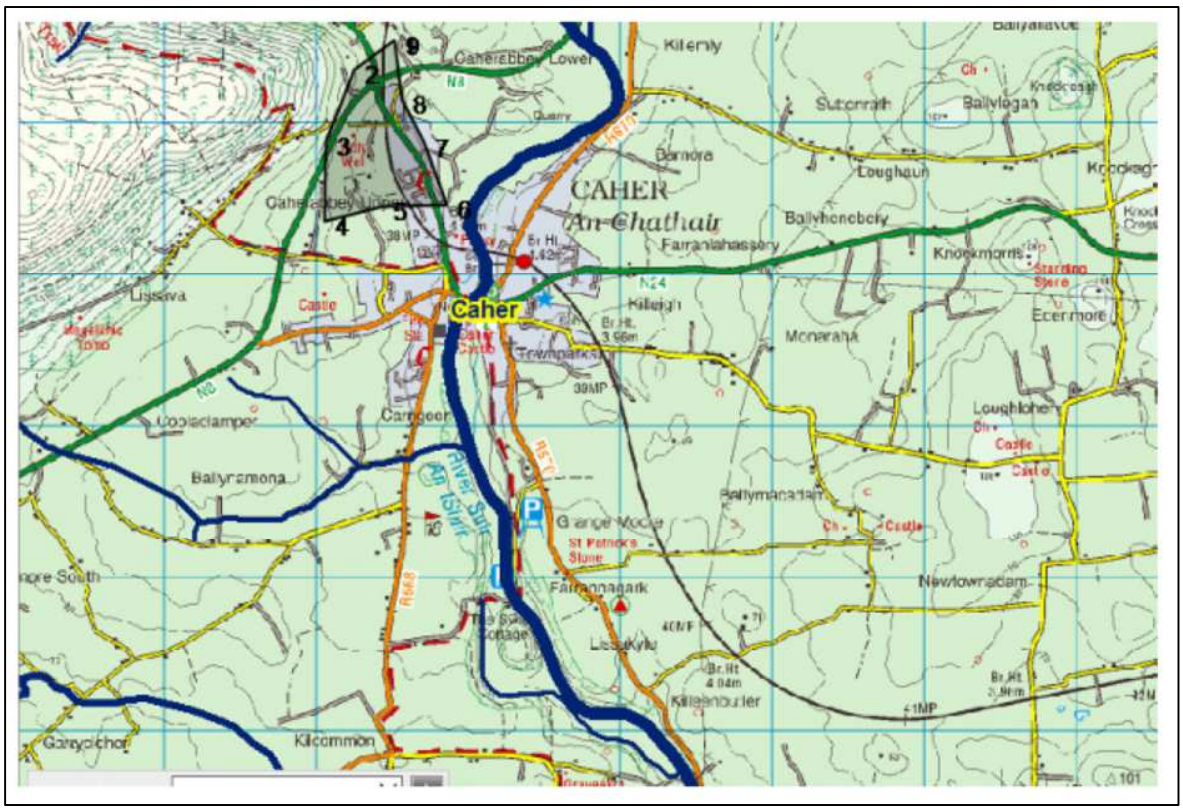


Figure 8.6. Map showing calculated area of catchment stream

Flood Discharge Calculations

The catchment size of the nearby stream to the study location in the Cahir Abbey Industrial Estate is 0.560km2. Using the Institute of Hydrology Report No. 124 (Flood Estimation for Small Catchments), the mean annual flood flow (QBAR) was calculated as follows.

$$QBARrural = 0.00108AREA^{0.89} \times SAAR^{1.17} \times SOIL^{2.17}$$

$$AREA = 0.560km^2$$

SAAR (Standard Annual Rainfall for the area) = 949mm

SOIL INDEX = 80% of catchment is regarded as well drained

Soil Index = 0.4

= 0.0006446308706 * 3043.697 * 0.136921037

=> QBARrural = 0.268647434 m^3/sec

The 100 yr & 1000 yr return periods are calculated using the projected multiplier growth factors for Ireland listed below (Cawely & Cunnane Paper entitled 'Comment On Estimation Of Greenfield Runoff Rates').

A10 = 0.362674035 m^3/sec (Freq Factor 1.35)

Q100 = 0.494311278 m^3/sec (Freq Factor 1.84)

Q1000 = 0.580278457 m^3/sec (Freq Factor 2.16)

Applying the climate change factors of 1.49 & 1.75 respectively as set out in **Table 8.1** results in the following discharge volumes which are used in the hydraulic modelling exercise

Q10 = 0.395314699m^3/sec (Climate Change Freq Factor 1.09)

Q100 = 0.736523805 m^3/sec (Climate Change Freq Factor 1.49)

Q1000 = 1.015487301 m^3/sec (Climate Freq Factor 1.75)

Table 8.1. Flood Frequency Factors & Projected Flood Levels

Return Periods	Frequency Factors (Ireland)	Climate Change Factor
1		0.81
2	0.96	0.78
5	1.2	0.97
10	1.35	1.09
25	1.55	1.26
50	1.7	1.38
100	1.84	1.49
1000	2.16	1.75

8.2.7.9 Survey Data and Modelling Outputs

A topographical survey of the site and surrounded area was carried out by John Howick O Brien. Four cross-sections which intercept the small stream were plotted across the business park to include the existing stream and proposed development site. The cross-sections traverse at 10m intervals. The information assists in establishing the channel profile, the level of the stream embankments and to identify any constrictions in the stream channel. The topographic survey conducted shows that the elevations of the base of the stream within each of the sections are similar at between 48.44m at cross section #1 and 48.74m at cross-section 4. The ground levels over the extent of the karting track will all be in excess of 49m.

A model of stream channel and surrounding lands were created using HEC-RAS river modelling software. An analysis of possible flooding predicted using the calculated 1:1000 yr hydraulic flow discharge of 1.015 was carried out. The critical depth was applied to the upstream and downstream boundary conditions within the model. The survey sheet and section drawings are set out in **Appendix 2.**

The cross-section drawings show that the projected 1:1000 yr discharge flow of 1.015 m3/sec in the nearby stream will not impact on the proposed development. The flood waters will reach a projected 49.08m during the predicted 1:1000 yr event at x-sections 3 & 4. The modelling outcome demonstrates that the flood waters will be retained within the confines of the stream channel and there will be no impact on the proposed kart development site. The proposed development which includes the karting track will be located at or above 42.08m. The extent of the stream reach and modelled cross-sections are set out in **Appendix 2**.

8.2.7.10 Justification Test

Section 3.5 of the DOELG *Flood Risk Management Guidelines for Planning Authorities* requires that any developments and land-use types including commercial developments should be subject to a justification test. The planning authority must be satisfied that it can clearly demonstrate on a solid evidence base that the zoning or designation for development will satisfy the Justification Test. The proposed development is located within an established Business Park close to Cahir Town Centre.

A Stage One Flood Risk Assessment has been undertaken in support of the Cahir Local Area Plan. The information gathered and outcomes of the Stage One Flood Risk Assessment has informed the Land Use Zoning Map 1 included in this LAP. The LAP has adopted the precautionary approach and lands subject to flooding have been zoned for amenity land use.

These amenity zoned lands will only be viewed as suitable for appropriate less vulnerable development and water-compatible development as described in Section 3.5 of the Flood Risk

Management Guidelines where same uses are acceptable under the Land Use Zoning Matrix and other relevant policies and objectives of the LAP. It is considered that using this methodology the avoidance principle of the sequential approach has been met and there is no requirement to proceed to Stage Two or Stage Three Flood Risk Assessment. However Policy INF 14 of the Plan states that 'The Council will require a comprehensive Flood Risk Assessment for proposals in an area at risk of flooding, adjoining same or where cumulative impacts may result in a flood risk elsewhere, in low lying areas and in areas adjacent to streams'.

The Stage 1 plan acknowledges that the Lower River Suir may overflow its banks on an intermittent basis. However, a precautionary approach has been adopted under the Cahir LAP and new development has been directed away from the flood plain area to minimise potential flood risk. Furthermore, lands at risk of flooding have been zoned for amenity land use within the plan. The plan states that the Planning Authority is satisfied that there is no potential flood risk identified in areas planned for growth in Cahir based on an assessment of all the sources listed above and bearing in mind a precautionary approach. The Cahir LAP Land Zoning Map is set out in **Figure 8.2**. The proposed development site is located within a zone designated as Light Industry & Employment. Section 5.1 of the DOE Guidelines refers to Justification Test criteria for development management to be submitted by the applicant). The 2nd Criteria requires that the proposal has been subject to an appropriate flood risk assessment that demonstrates:

- The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk;
- The development proposal includes measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible;
- The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures and provisions for emergency services access; and

- The development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes.

The Anecdotal evidence shows that there is no history of flooding at the proposed development site within the Cahir Abbey Industrial Estate and that the site has not flooded previously. However the OPW CRFAMS maps developed in 2016 shows part of the site to be at risk from an extreme fluvial event in the nearby stream which flows in a southerly direction close to the west boundary of the site. The site specific modelling shows that the nearby stream the stream will not overflow its bank in the case of a 1:1000 year discharge event and that there will be no fluvial risk to the proposed development.

There will be no increased risk of flooding as a result of the proposed kart track development. The site specific modelling has demonstrated that there will be no increased risk of flooding either within the site or to third parties from the proposed development. There will be no discharge of surface water runoff to the nearby stream from the proposed development. All surface water generated from the proposed kart track development will be discharged to ground via a suitably designed surface water soakaway/Aqua cell. The surface water cell will be designed in accordance with SUDS principles. No additional flood prevention or mitigation measures are required in this case as the development is shown not to be at risk.

8.2.7.11 Conclusions of flood risk assessment

The report was compiled in response to a request for further information received from Tipperary County Council in relation to planning application on behalf of the applicant Buttimer Engineering to construct a karting track an all other site development works at Cahir Abbey Industrial Estate, Cahir Abbey Lower & Cahir Abbey Upper, Cahir, Co. Tipperary.

Item 2 of the FI Request required the applicant to prepare and submit a site-specific flood risk assessment for the proposed development site in accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities, DEHLG 2009. In addition, the applicant is requested to demonstrate that the development would not give rise to flood risk elsewhere through flood water displacement.

The evidence available shows that there is no history of flooding within the Cahir Abbey Business Park. However, the OPW Fluvial extent map published in 2016 shows that part of the site to be at risk from an extreme fluvial event associated with a nearby stream located close to access to the park on Abbey Street. The map shows that the site will not be impacted from any fluvial event associated with the larger River Suir which is located approximately 500m to the south/east of the site.

A topographical survey of the site was conducted the results of which were incorporated into a hydraulic model. A model of stream channel and surrounding lands was created using HEC-RAS river modelling software. Floodwater elevations associated with the stream were predicted using the calculated 1:1000 yr hydraulic flow discharge of 1.015 m3/sec. The model predicts that the flood waters will reach a projected 49.08m during the predicted 1:1000 yr event at x-sections 3 &

4. The outcome shows that the flood waters will be retained within the confines of the stream channel and that there will be no flood impact on the proposed kart development site. The proposed development which includes the kart track will be located at or above 42.08m.

The report shows that there will be no increased risk of flooding either within the site or to third parties from the proposed development. Surface water run-off from the proposed development will be diverted to an underground Aquacell SUDS system. The attenuation system which will by adequately sized to manage the run-off from an extreme rainfall event. The proposed development will not obstruct flood paths, reduce the flood plain storage. No additional flood prevention or mitigation measures are required in this case as the development is shown not to be at risk.

8.3 Predicted impacts Population and Human Health

The construction phase of the proposed development is likely to have a positive moderate direct impact via increased temporary employment.

Once operational there will be up to ten individuals employed here. Furthermore, the development will benefit the local economy and be a positive move towards meeting the aims of the Cahir LAP. As per the following text in the Cahir LAP:

In addition this LAP aims to facilitate and guide the development of additional attractions and facilitates to encourage tourists to extend their stay and increase expenditure in the town.

The proposed development will add an additional attraction and facility to the town, therefore encouraging tourists (and locals alike) to increase their expenditure in the town and extend their stay.

There will be increased vehicle movements associated with facility visitors and staff. However, such emissions are unlikely to be significant in the context of existing vehicle movements across the surrounding industrial estate, and traffic using the R640 and M8 routes.

Traffic may potentially be disrupted as a result of slight increases in traffic. The provision of a Construction Traffic Management Plan will mitigate and reduce the environmental impacts of the construction phase of the development.

In order to facilitate traffic movements during the proposed works, a "Stop and Go" traffic management system will be implemented whereby one road carriage way will remain open for the phased stages of the works on the public roads. It is estimated that works within the road will take several weeks.

The impact of the traffic generated by the construction phase of the proposed development is considered to be temporary in nature and will only be relevant for the duration of works. Therefore the works will have a short-term, minor impact on traffic movement and waiting times during construction works. Similarly there will be a short-term minor impact on recreational activities, primarily walking, during construction works.

Developments have the potential to impact on local residents due to adverse impacts on local views and visual amenity. The landscape surrounding the proposed development site is largely urban in nature. The development will be for the most part screened from surrounding properties by the existing industrial units at the Cahir Abbey Industrial Estate. There will be limited view of the site from the northern foothills of the Galtee Mountains, approximately 1km north of the proposed development site.

The Draft Tipperary Landscape Character Assessment (2016) has designated 23 Landscape Character Areas within County Tipperary. Cahir town is located in an area known at the "Town and Urban Fringes". These towns represent the largest settlements of the county and due to their size relative to the smaller county settlements, they are considered to have an urban character that sets them apart from the surrounding rural hinterland. This report notes that these towns are capable of adsorbing development and change without affecting their character. Development and growth can have a positive effect on the character and sense of place of these settlements.

With regard to the Landscape and Sensitivity of this area the *The Draft Tipperary Landscape Character Assessment* (2016) notes:

The growth and development of the towns is an integral element of the character of the county. In general the towns have a robust capacity for growth and development and are, generally, classified as being Robust Class 0 with very high and low sensitivity – subject to the observance of general planning objectives and policies.

There are a number of protected views located within Cahir town. However, the proposed development will not have an impact on these. The visual impact will not be significant. Overall there will be no adverse impact on views, the scenic value of the local landscape or on local amenity value.

8.4 Mitigation

No specific mitigation measures are required to ameliorate the impacts on human beings. The proposed development will allow the facility to continue operating as heretofore, thus maintaining employment at current levels. Mitigation measures in relation to the potential human health impacts of air and noise are addressed in the relevant chapters.

8.5 Residual impacts

The proposed development will add to local amenities within the town and employ up to ten people once operational. The proposed development is in line with the aims set out in Cahir LAP (2011) and will encourage tourists to increase their expenditure in the town and extend their stay.

Overall, given the scale and nature of the proposed development, the long-term impact on human health and visual amenity is predicted to be minor in the short term and negligible in the long-term. The risk from flooding or that the development will cause increased flooding is negligible.

Chapter 9. Biodiversity

9.1. Introduction

This Chapter provides an assessment of the impacts (and resulting effects) of the proposed karting track development at Cahir Abbey Industrial Estate, Cahir, Co. Tipperary, on terrestrial and aquatic biodiversity in the receiving environment. Full details of the proposed development can be found in **Chapter 3. Description of Proposed Development**.

This chapter of the EIAR describes the existing flora and fauna within and in the vicinity of the proposed development site and the surrounding area. This chapter reviews the likely significant impacts and proposes measures for the mitigation of these impacts, where appropriate.

9.2 Assessment Methodology

9.2.1 Introduction

This appraisal is based on surveys of the proposed site and surrounding area and a review of desktop data. An ecological survey was carried out on the 9th of October 2019. Whilst the survey took place outside the ideal growing season for plants the development area is dominated by highly modified habitats and the potential for rare or uncommon species to occur is negligible.

9.2.2 Relevant Legislation

Flora and fauna in Ireland are protected at a national level by the Wildlife Acts, 1976 to 2000 and the European Communities (Birds and Natural Habitats) Regulations 2011. They are also protected at a European level by the EU Habitats Directive (92/43/EEC) and the EU Birds Directive (79/409/EEC) amended in 2009 as the Directive 2009/147/EC.

Under this legislation, sites of nature conservation importance are then designated in order to legally protect faunal and floral species and important/vulnerable habitats.

The categories of designation are as follows:

- Special Areas of Conservation (SAC) are designated under the European Communities (Birds and Natural Habitats) Regulations 2011 to comply with the EU Habitats Directive (92/43/EEC);
- Special Protection Areas (SPAs) and designated under the EU Birds Directive (79/409/EEC) amended in 2009 as the Directive 2009/147/EC; and
- Proposed Natural Heritage Areas (pNHA) are listed under the Wildlife (Amendment) Act, 2000. They have limited legal protection under Local Authority Development Plans.

9.2.3 Desktop Review

A desktop study was carried out to collate the available information on the local ecological environment. The purpose of the desktop study was to identify features of ecological value occurring within the development site and those occurring in close proximity to it. A desktop review also allows the key ecological issues to be identified early in the appraisal process and facilitates the planning of surveys. Sources of information utilised for this report include the following:

- National Parks & Wildlife Service (NPWS) - www.npws.ie;
- Environmental Protection Agency (EPA) – www.epa.ie;
- National Biodiversity Data Centre – www.biodiversityireland.ie;
- County Meath Biodiversity Action Plan (Draft) 2015-2020;
- Bat Conservation Ireland - http://www.batconservationireland.org;
- Birdwatch Ireland - http://www.birdwatchireland.ie/;
- British Trust for Ornithology (BTO)-www.BTO.ie;
- *Best Practice Guidance for Habitat Survey and Mapping* (Heritage Council, 2011);
- *Guidance on integrating climate changes and biodiversity into environmental impact assessment* (EU Commission, 2013);
- *Guidelines for Assessment of Ecological Impacts of National Road Schemes (National Roads Authority* (2009);
- National Biodiversity Action Plan 2017-2021;
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August, 2018);
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (Draft August 2017);
- Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU) European Union, 2017.

9.2.4 Guidance

This Chapter of the EIAR follows the Environmental Protection Agency's Draft *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (EPA, 2017). It also takes account of the draft *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment* (Department of Environment, Community and Local Government, July 2012), Chartered Institute of Ecology and Environmental Management *Guidelines on Ecological Impact Assessment in the UK and Ireland, 2nd edition* (CIEEM 2016) and Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, Version 1.1 (CIEEM, 2018). Reference were also made to the following key legislation and documents where relevant:

<u>European</u>

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (The Habitats Directive);

- Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds (codified version of Directive 79/409/EEC as amended) (The Birds Directive);
- Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy (The Water Framework Directive);
- Directive 2006/44/EC of the European Parliament and of the Council of 6 September 2006 on the quality of fresh waters needing protection or improvement in order to support fish life (The Fish Directive (consolidated)).

Republic of Ireland

- The Wildlife Act 1976 as amended by the Wildlife Act 1976 (Protection of Wild Animals) Regulations, 1980, the Wildlife (Amendment) Act 2000, the Wildlife (Amendment) Act 2010, European Communities (Wildlife Act, 1976) (Amendment) Regulations 2017. (The Wildlife Act);
- European Communities (Conservation of Wild Birds) Regulations 1985 (S.I. 291/1985) as amended by S.I. 31/1995;
- European Communities (Natural Habitats) Regulations, S.I. 94/1997 as amended by S.I. 233/1998 & S.I. 378/2005 (The Habitats Regulations);
- Fisheries (Consolidation) Act, 1959 (as amended), hereafter referred to as the Fisheries Act;
- European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011);
- The Flora (Protection) Order, 1999 (S.I. No. 94/1999).

9.2.5 Surveys Overview

Surveys were carried out at the site in the 9th of October 2019. The likelihood of additional ecological impacts occurring, which have not been identified in this EIAR, is considered remote. The following surveys were carried out.

- Habitats were mapped according to the classification scheme outlined in the Heritage Council publication *A Guide to Habitats in Ireland (Fossitt, 2000)* and following the guidelines contained in *Best Practice Guidance for Habitat Survey and Mapping (Heritage Council, 2011).* Habitats were cross reference with Habitats Directive Annex 1 habitats.
- The site was surveyed for invasive species and rare floral species.
- All bird species recorded during the walkover survey and habitat survey were recorded.
- A general mammal survey was carried out in conjunction with the habitat survey. No roosting habitat, high value commuting or feeding habitat for bats was recorded and therefore no specialised bat surveys were considered necessary.
- No surface watercourses enter the proposed development site or are discharged from the proposed works area and thus no aquatic surveys were considered necessary.

9.3 Receiving Environment

9.3.1 General Landscape

The site is located within the Cahir Abbey Industrial Estate which lies on the northern fringes of Cahir town, on the eastern side of regional route R640, approximately 1km north of the town centre. The R640 meets the R639 300m north of the industrial estate. The R639 runs parallel to the M8 motorway. The applicant's site lies at the southeast corner of the industrial estate. The proposed karting track in turn lies at the southeast corner of the site (**Figure 9.1**).

Figure 9.1: Proposed karting track location.

The local topography is flat. The landscape reflects the site's location on the edge of a town. The landscape is immediately dominated by the adjacent industrial estate. On the western side of the estate, residential development extends along both sides of the R640. This residential development is formed by a mixture of period dwellings, small residential estates, and one-off dwellings. The development continues south towards the town centre. To the north of the industrial estate, as the R640 approaches the R639, the landscape becomes more open and begins to rise gradually, and the urban environment gives way to scattered one-off dwellings. To the east and northeast of the site, the landscape is dominated by a closed sand and gravel quarry.

9.3.2 Designated Conservation Areas

There are no environmental designations located within the study area. Thus, the site of the proposed development does not form part of any Natural Heritage Area (NHA), Special Protection Area (SPA), Special Area of Conservation (SAC) or candidate Special Area of Conservation (cSAC), Nature Reserve, or National Park.

9.3.2.1 European (Natura 2000) Sites

Special Areas of Conservation (SACs) and candidate SACs are protected under the Habitats Directive 92/43/EEC and the European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Special Protection Areas (SPAs) are protected under the Birds Directive 2009/147/EC and European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Collectively, these sites are referred to as Natura 2000 or European sites.

In accordance with the European Commission Methodological Guidance (EC2001), a list of Natura 2000 Sites that can be potentially affected by the proposed project has been complied. All candidate SAC's (cSAC) and SPAs sites potentially affected by the proposed development have been identified, **Table 9.1** relevant Natura 2000 sites are shown in **Figure 9.1**. It is noted that use of a 15 km radius was used as a precautionary measure, as impacts at this distance from the proposed development are highly unlikely in the absence of significant aqueous emissions.

Table 9.1. Designated sites and location relative to the proposed development area.

Site	Code	Distance at the closest point (approx.).
Special Area of Conservation (SAC)		
Lower River Suir	002137	Located 160m south-southeast
Galtee Mountains	000646	Located 8.1km west

There is no direct hydrological connection to any of the Natura 2000 sites listed in **Table 9.1**. Once the track is operational all surface water generated from the proposed kart track development will be discharged to groundwater via an Aco Channel and Bypass Interceptor (see **Section 3.2.3** for further details). However, the site lies within the Suir River Catchment. During construction there is no direct hydrological route by which surface discharges could impact on the River Suir.

The River Suir system flows through the counties of Tipperary, Kilkenny and Waterford. The site consists of all of the freshwater stretches of the Suir immediately south of Thurles, the tidal stretches as far as the confluence with the Barrow/Nore immediately east of Cheekpoint in Co. Waterford, and many of the tributaries including the Clodiagh, the Lingaun, Anner, Nier, Tar, Aherlow and Multeen. Much of the system flows through Carboniferous limestone, though towards Waterford the geology changes to Old Red Sandstone and Ordovician bedrocks. The site

supports a diverse range of habitats, including marsh, reedbeds, wet and dry grasslands, broad-leaved semi-natural woodlands, salt marshes, tidal rivers and estuarine channels. Substantial areas of improved grassland and arable lands are included for water quality reasons.

The Lower River Suir SAC contains a range of Annex I habitats, including floating river vegetation, eutrophic tall herbs, alluvial forest, old oak woods, yew woods and salt meadows. The site is very important for the presence of a number of scarce and specialised Annex II animal species with particularly important populations of the fish species Salmon and Twaite Shad. Otter is widespread on the system, as is White-clawed Crayfish. The site supports two Annex I priority and five non-priority Annex I habitats. Four Annex I species of birds have been recorded within this SAC. The rare lichen *Lobaria pulmonaria*, an ancient woodland indicator, occurs at Portlaw Oak Woods.

It is noted that due to the dilution provided within the riverine environment of the River Suir, the potential for impacts from minor increases in silt levels and/or minor hydrocarbons spills is negligible. The proposed development will operate an onsite surface water drainage scheme that has been designed in accordance with SuDs principles.

Potential impacts on designated Natura 2000 sites (SAC/cSAC/SPA) are specifically addressed in the AA screening report which has been submitted as part of this application. The AA screening report notes that following a comprehensive evaluation of the potential direct, indirect and cumulative impacts on the qualifying interests and conservation objectives for Natura 2000 sites, it has been concluded that the proposed development will not have an adverse effect on the integrity of Natura 2000 sites.

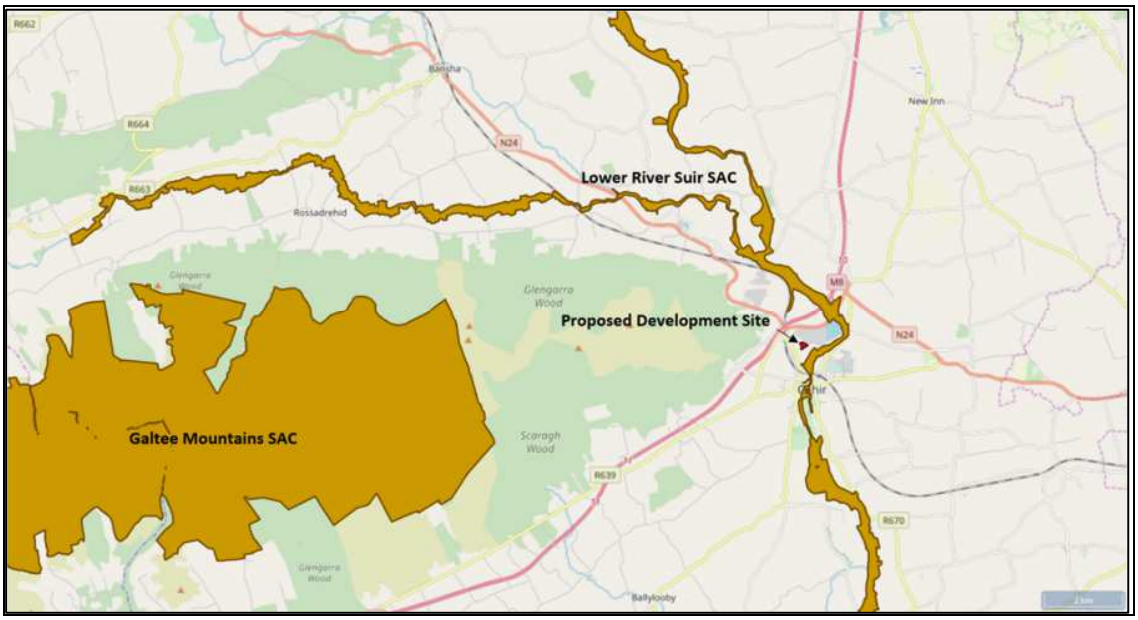


Figure 9.2: Natura 2000 Sites in relation to the proposed karting track development site at Cahir Abbey Industrial Estate, Cahir, Co. Tipperary.

9.3.2.2 Nationally Protected Sites

Natural Heritage Areas (NHAs/pNHAs) are national designations under the Wildlife Act 1976, as amended. A Natural Heritage Area (NHA) is designated for its wildlife value and receives statutory protection. A list of proposed NHAs (pNHAs) was published on a non-statutory basis in 1995, but these have not since been statutorily proposed or designated.

The following proposed NHAs, as shown in **Figure 9.3**, are located in the vicinity of the proposed development:

- Cahir Park Woodland (Site Code: 001579) located approximately 2.2 km south
- Rockwell College Lake (Site Code: 000970) located approximately 8.2 km north-northeast
- Quarryford Bridge (Site Code: 001526) located approximately 8.1 km north
- Scaragh Wood (Site Code: 000971) located approximately 2.0 km west-southwest
- Galtee Mountains (Site Code: 000646) located approximately 8.1 km west
- Shanbally Wood (Site Code: 000972) located approximately 12.7 km southwest
- Bansha Wood (Site Code: 002043) located approximately 12.3 km northwest
- Marlfield Lake (Site Code: 001981) located approximately 12.3 km east-southeast

There is no relevant connectivity with these sites and there are no other conservation sites with biological connectivity to the subject site that would be affected by the proposed project.

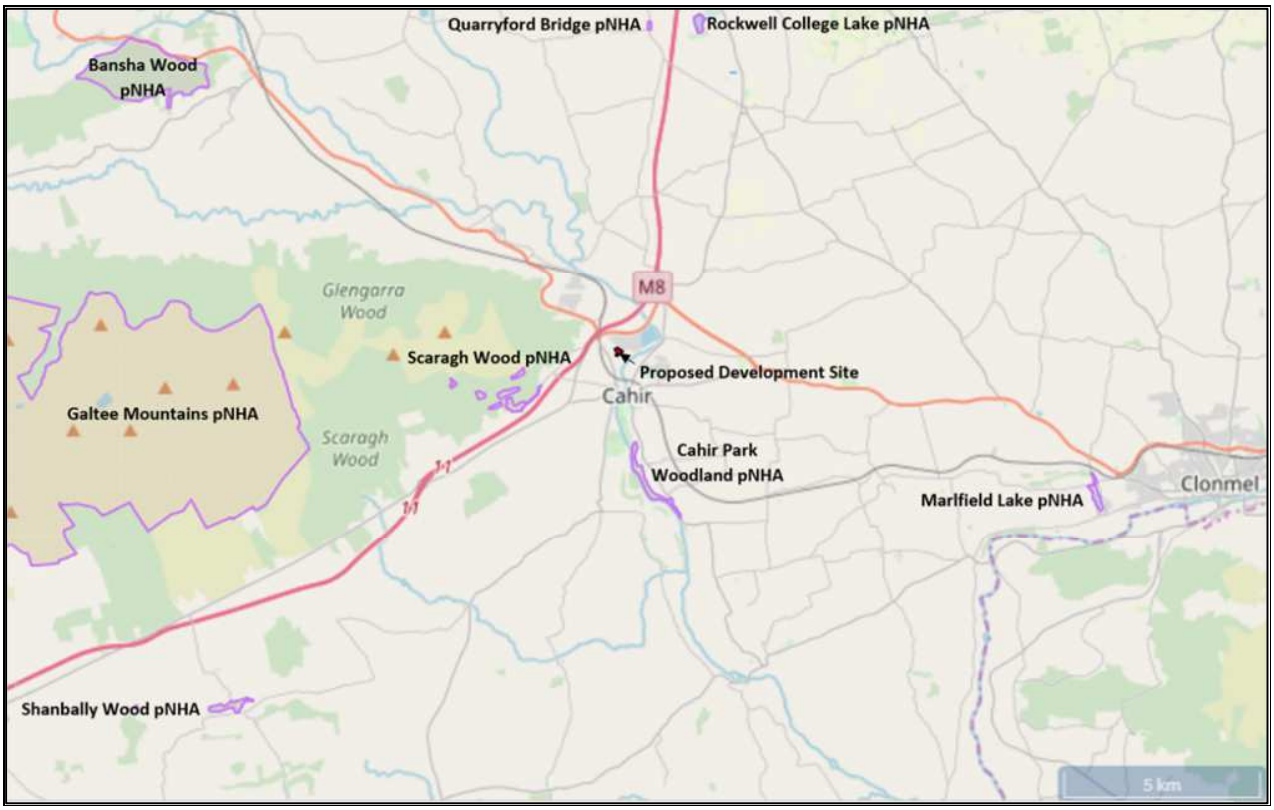


Figure 9.3: Proposed Natural Heritage Sites in relation to the proposed karting track development site at Cahir Abbey Industrial Estate, Cahir, Co. Tipperary.

9.3.3 Site Survey

A site inspection was carried out on the 9th of October 2019. Habitat mapping was carried out in line with the methodology outlined in the Heritage Council Publication, *Best Practice Guidance for Habitat Survey and Mapping* (Heritage Council, 2011). The terrestrial and aquatic habitats within or adjacent to the proposed development site was classified using the classification scheme outlined in the Heritage council publication *A Guide to Habitats in Ireland* (Fossitt, 2000) and cross referenced with Annex 1 Habitats where required. The survey results are representative of the habitats within the application site and include the dominant and characteristic species of flora. No rare plant species were recorded within the works area during the site survey.

The site of the proposed track currently consists of cleared level ground at the southeast corner of the holding. Thus, the northern and western sides of the proposed track adjoin existing open areas within the site. The eastern and southern sides directly adjoin the site boundary.

The north western boundary of the applicant's site is formed by an industrial unit within the applicants landholding. The western site boundary adjoins the industrial estate, and part of the boundary directly abuts an industrial unit. The southern boundary is formed by an unpaved track which provides access to nearby fields and disused quarry. The eastern and north-eastern boundaries adjoin disturbed ground and scrub associated with a neighbouring quarry. The site is currently accessed by a gate at the southwest corner.

A current overview of habitats recorded within the site is shown in **Figure 9.4** and the habitats recorded on site are described below. Their ecological value is detailed in **Table 9.2.** The ecological value of habitats has been defined using the classification scheme outlined in the *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (National Roads Authority, 2009) which is included in **Appendix 1**. It should be noted that the value of a habitat is site specific and will be partially related to the amount of that habitat in the surrounding landscape. Habitats that are considered to be good examples of Annex I and Priority habitats are classed as being of International or National Importance. Semi-natural habitats with high biodiversity in a county context and that are vulnerable, are considered to be of County Importance. Habitats that are semi-natural, or locally important for wildlife, are considered to be of Local Importance (higher value) and sites containing small areas of semi-natural habitat or which maintain connectivity between habitats are considered to be of Local Importance (lower value).

9.3.3.1 Habitat survey – proposed works area

Habitats within the proposed works area are generally of low ecological value at a local level i.e. buildings and artificial surfaces (BL3), spoil and bare ground (ED2) and recolonising bare ground (ED3), and Scrub (WS1). Most of the species noted within the site including groundsel, willowherb and thistle species are early successional species which colonise bare ground. Small areas of scrub with willow are becoming established. Clusters of rowen, hawthorn and common cherry are planted along the south eastern boundary of the site as specified by a previously granted planning application. These trees are underplanted with laurel and holly which over time will form a dense thick screen.

Table 9.2. Habitat types affected within the works areas and their relative ecological value.

Habitats	Comments	Ecological value (NRA guidelines)
Buildings and artificial surfaces (BL3)	This is a highly modified habitat with low species diversity and little value for wildlife.	Local importance (Lower value)
Recolonising bare ground (ED3)	This is a highly modified habitat with low species diversity and limited value for wildlife.	Local importance (Lower value)
Spoil and bare ground (ED2)	This is a highly modified habitat with low species diversity and little value for wildlife.	Local importance (Lower value)
Scrub (WS1)	Limited in extent.	Local importance (Lower value)

Treeline (WL1)	Non native species predominant	Local importance (Lower value)

9.3.4 Flora

The site of the development lies within Ordnance Survey National Grid 10km square S02. The National Parks and Wildlife Service (NPWS) rare plant database notes the presence of a single protected plant species within grid square S02, namely Basil Thyme (*Clinopodium acinos*). Basil Thyme is protected by the Flora Protection Order 2015 (S.I. No. 356 of 2015) and is classed as 'Near Threatened' in the Red Data List of Vascular Plants 2016. Basil Thyme is an annual, occasionally short-lived perennial, herb of sunny, open calcareous habitats. It grows in dry, calcareous, grassy habitats such as quarries, rocky sites and grassy, arable land. This species was not recorded within study area during site survey and habitats within the proposed development area are unsuitable for this species.

The National Biodiversity Data Centre (NBDC) online database provides data on the distribution of mammals, birds, and invertebrates within the 10km grid squares. Some 95 flowering plants are listed by the NBDC as present in the grid square S02. **Table 9.3** lists the flowering plants recorded within grid square S02 that are listed as threatened species and/or require designations. These species were not recorded. No rare species were recorded during the site survey, nor are they expected to occur given that the habitats within the works areas are relatively common.

Table 9.3: NBDC flowering and endangered flowering plants for grid square S02.

Flowering plant Species	Latin Name	Designations
Cloudberry	*Rubus chamaemorus*	Threatened Species: Endangered
Blue Fleabane	*Erigeron acer*	Threatened Species: Endangered

9.3.5 Invasive species

Non-native plants are defined as those plants which have been introduced outside of their native range by humans and their activities, either purposefully or accidentally. Invasive non-native species are so-called as they typically display one or more of the following characteristics or features: (1) prolific reproduction through seed dispersal and/or re-growth from plant fragments; (2) rapid growth patterns; and, (3) resistance to standard weed control methods.

Where a non-native species displays invasive qualities and is not managed it can potentially: (1) out compete native vegetation, affecting plant community structure and habitat for wildlife; (2) cause damage to infrastructure including road carriageways, footpaths, walls and foundations; and, (3) have an adverse effect on landscape quality. The NBDC lists a number of aquatic and terrestrial high impact invasive species which have been recorded within the 10km grid square S02 (**Table 9.4**).

Table 9.4: NBDC list of high impact invasive species.

Common Name	**Latin Name**
Flora	
Japanese Knotweed	*Fallopia japonica*
Rhododendron	*Rhododendron ponticum*
Canadian Waterweed	*Elodea canadensis*
Terrestrial Mammal	
Eastern Grey Squirrel	*Sciurus carolinensis*
Fallow Deer	*Dama dama*

Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 make it an offence to plant, disperse, allow dispersal or cause the spread of certain species e.g. Japanese knotweed and Rhododendron, keep the plant in possession for purpose of sale, breeding, reproduction, propagation, distribution, introduction or release, keep anything from which the plant can be reproduced or propagated from the species, without a granted licence and keep any vector material for the purposes of breeding, distribution, introduction or release. Regulation 49 deals with the '*Prohibition on introduction and dispersal*' while Regulation 50 deals with the '*Prohibition on dealing with and keeping certain species*'. Regulation 50 has yet to be brought into Irish law. Regulation 74 is a transitional provision in relation to Regulation 49 and 50.

The EU Regulation (No.1143/2014) on invasive alien species entered into force on 1st January 2015. This Regulation seeks to address the problem of invasive alien species in a comprehensive manner to protect native biodiversity and ecosystem services, as well as to minimize and mitigate the human health or economic impacts that these species can have.

The Wildlife (Amendment) Act 2000 states that anyone who plants or otherwise causes to grow in a wild state in any place in the State any species of (exotic) flora, or the flowers, roots, seeds or spores of (exotic) flora shall be guilty of an offence. There is a statutory obligation under S.I. 477 of 2011 of the European Communities (Birds and Natural Habitats) Regulations 2011 to address invasive species in Ireland.

No high-risk invasive species were recorded during the recent site survey. However, the non-native invasive species Butterfly Bush/Buddleja (*Buddleja davidii*) was recorded within the overall site but outside the proposed works area. Butterfly Bush/Buddleja is classified as an Amber Threat species by Invasive Species Ireland which under the right ecological conditions may have a negative impact on native species or habitats. Butterfly Bush is also included in the NRA Guidelines on the Management of Noxious Weeds and Non-native Species on National Roads (NRA, 2010) as this species has been shown to have an adverse impact on landscape quality, native biodiversity or infrastructure; and is likely to be encountered during road schemes.

Buddleja or butterfly bush is native to temperate central and south-western China, brought to Europe in the nineteenth century for use as a garden shrub owing to its profusion of flowers which tend to attract a considerable diversity of butterflies.

Buddleja is a medium to large perennial shrub that grows up to 5m tall. It is a very fast-growing species which can reach 2m in its first year, producing flowers and setting seed. It has long arching branches with lilac/purple (sometimes white) flowers, which occur in dense pyramidal shaped panicles during the period June to September. These produce large quantities of nectar. The opposite leaves are lance shaped, deep green above and white-tomentose below.

The seeds produced are very small and numerous with up to 3 million produced per plant. Seeds show lengthy dormancy, remaining in the seed bank for several years. Seeds are adapted for wind dispersal and to a lesser extent dispersal by water. Seeds can be distributed over long distances using wind currents. Additional dispersal can be facilitated by the air currents generated by cars and trains. Stem cuttings can also regenerate new plants and these can be dispersed via waterways. It colonises bare ground very rapidly and can quickly form mono-typic stands. These shrubs also alter the nitrogen and phosphorous amounts in the soil, giving it an advantage that displaces native species, particularly in riparian areas.

Spreading rapidly by windburn seed, butterfly bush displaces native vegetation in disturbed, open areas. It tolerates very poor soils and is capable of growing on walls, rock outcrops or sub-soil. Buddleja can cause structural damage when plants get a foothold in walls, pavements, chimneys etc. Listed and historic buildings can be particularly under threat from the species.

9.3.6 Fauna

9.3.6.1 Otter (*Lutra lutra*)

Otters, along with their breeding and resting places are protected under the provisions of the Wildlife Act 1976, as amended by the Wildlife (Amendment) Act, 2000. Otters have additional protection because of their inclusion in Annex II and Annex IV of the Habitats Direct which is transposed into Irish law in the European Communities (Natural Habitats) Regulations (S.I 94 of 1997), as amended. Otters are also listed as requiring strict protection in Appendix II of the Berne Convention on the Conservation of European Wildlife and Natural Habitats and are included in the Convention on International Trade of Endangered species (CITES).

Although rare in parts of Europe they are widely distributed in the Irish countryside in both marine and freshwater habitats. Otters are solitary and nocturnal and as such are rarely seen. Thus,

surveys for otters rely on detecting signs of their presence. These include spraints (faeces), anal gland secretions, paths, slides, footprints and remains of prey items. Spraints are of particular value as they are used as territorial markers and are often found on prominent locations such as grass tussocks, stream junctions and under bridges. In addition, they are relatively straightforward to identify.

Otters occasionally dig out their own burrows but generally they make use of existing cavities as resting placing or for breeding sites. Suitable locations include eroded riverbanks, under trees along rivers, under fallen trees, within rock piles or in dry drainage pipes or culverts etc. If ground conditions are suitable the holt may consist of a complex tunnel and chamber system. Otters often lie out above ground especially within reed beds where depressions in the vegetation called “couches” are formed. Generally, holts or resting areas can be located by detecting signs such as spraints or tracks.

In contrast natal holts which are used by breeding females can be extremely difficult to locate. They are often located a considerable distance from any aquatic habitats and otters may also use habitats adjoining small streams with minimal or no fish populations. In addition, natal holts are usually carefully hidden and without obvious sprainting sites. Otters do not have a well-defined breeding season.

It is noted that otters are largely nocturnal, particularly in areas subject to high levels of disturbance as evidenced by the presence of otters in the centre of Cork and Limerick City. Thus, otters are able to adapt to increased noise and activity levels; however, breeding holts are generally located in areas where disturbance is lower.

A review of existing records within a 10km radius of the study site (grid square S02) showed that otter or signs of otter have been recorded on 10 occasions, the most recent being in August 2018. Otter has been recorded within and is known to occur within the River Suir. There are no habitats within the proposed development site or in proximity to it suitable for otter.

9.3.6.2 Bats

In Ireland, nine species of bat are currently known to be resident with the residency of the tenth recorded species yet to be proven. These are classified into two Families: the Rhinolophidae (Horseshoe bats) and the Vespertilionidae (Common bats). The lesser horseshoe bat *Rhinolophus hipposideros* is the only representative of the former Family in Ireland. All the other Irish bat species are of the latter Family and these include three pipistrelle species: common *Pipistrellus pipistrellus*, soprano *P. pygmaeus* and Nathusius’ *P. nathusii*, four *Myotids*: Natterer’s *Myotis nattereri*, Daubenton’s *M. daubentonii*, whiskered *M. mystacinus*, Brandt’s *M. brandtii*, the brown long-eared *Plecotus auritus* and Leisler’s *Nyctalus leisleri* bats.

Whiskered and Natterer’s bats are listed as ‘Threatened in Ireland’, while the other species are listed as ‘Internationally Important’ in the Irish Red Data Book 2: Vertebrates (Whilde, 1993). The population status of both Whiskered and Natterer’s bats was considered ‘indeterminate’ because of the small numbers known of each, a few hundred and approximately a thousand respectively.

Ireland is considered to be an international stronghold for Leisler's bat, whose global status is described as being at 'low risk, near threatened' (LR; nt) by the IUCN (Hutson, *et al*., 2001).

Near threatened status is applied to those taxa that are close to being listed as vulnerable (facing a high risk of extinction in the wild in the medium-term future on the basis of a range of criteria defined by the IUCN). The Irish population of the Lesser Horseshoe Bat is estimated at 14,000 individuals and is considered of International Importance because it has declined dramatically and become extinct in many other parts of Europe. Data collected shows that the species increased significantly between from the early 1990's to present.

A review of existing bat records within a 10km radius of the study site (sourced from BCIreland's National Bat Records Database) showed that the Irish bat species have been listed in **Table 9.5** have been recorded. It is noted that other species which have not been included within this database are also likely to occur. Lesser horseshoe bat (*Rhinolophus hipposideros*) is the only species of bat listed on Annex II of the Habitats Directive (Directive 92/43/EEC).

Table 9.5: Presence of Irish bat species within grid squares S02.

Common name	Scientific name	Presence
Lesser Noctule	*Nyctalus leisleri*	Absent
Pipistrelle	*Pipistrellus pipistrellus sensu lato*	Present
Soprano Pipistrelle	*Pipistrellus pygmaeus*	Present
Daubenton's Bat	*Myotis daubentonii*	Present
Natterer's Bat	*Myotis nattereri*	Absent
Brown Long-eared Bat	*Plecotus auritus*	Present
Whiskered Bat	*Myotis mystacinus*	Absent
Lesser Horseshoe	*Rhinolophus hipposideros*	Absent
Nathusius's Pipistrelle	*Pipistrellus nathusii*	Absent

While the remaining Irish bat species; Lesser Noctule, Nathusius' pipistrelle Natterer's Bat, Whiskered Bat and Brandt's *M. brandtii* bats have not been recorded in the local area to date, Brown Long-Eared, Lesser Noctule, Soprano and Common Pipistrelle and Whiskered Bats could occur as these species are widespread in the Irish countryside. Nathusius' pipistrelle, Natterer's bat and Brandt's bat, are rarer Irish species, which are less likely to occur.

All bat species are protected under the Wildlife Acts (1976 & 2000) which make it an offence to wilfully interfere with or destroy the breeding or resting place of all species; however, the Acts permit limited exemptions for certain kinds of development. All species of bats in Ireland are listed

in Schedule 5 of the 1976 Act and are therefore subject to the provisions of Section 23 which make it an offence to:

- Intentionally kill, injure or take a bat
- Possess or control any live or dead specimen or anything derived from a bat
- Wilfully interfere with any structure or place used for breeding or resting by a bat
- Wilfully interfere with a bat while it is occupying a structure or place which it uses for that purpose.

All bats are listed on Annex IV of the EU Habitats Directive. The domestic legislation that implements this Directive gives strict protection to individual bats and their breeding and resting places. It should also be noted that any works interfering with bats and especially their roosts, including for instance, the installation of lighting in the vicinity of the latter, may only be carried out under a licence to derogate from Regulation 23 of the Habitats Regulations 1997, (which transposed the EU Habitats Directive into Irish law) issued by NPWS. The details with regards to appropriate assessments, the strict parameters within which derogation licences may be issued and the procedures by which and the order in relation to the planning and development regulations such licences should be obtained, are set out in Circular Letter NPWS 2/07 "Guidance on Compliance with Regulation 23 of the Habitats Regulations 1997 - strict protection of certain species/applications for derogation licences" issued on behalf of the Minister of the Environment, Heritage and Local Government on the 16th of May 2007.

Furthermore, on 21st September 2011, the Irish Government published the European Communities (Birds and Natural Habitats) Regulations 2011 which include the protection of the Irish bat fauna and further outline derogation licensing requirements. **Table 9.6** summarises the protection given to bats by national and international legislation and conventions.

Table 9.6 Legislative protection for bats in Ireland

Legislation/Convention	Relevance to Irish bats
Irish Wildlife Act (1976) & Irish Wildlife (Amendment) Act 2000.	It is an offence to wilfully interfere with or destroy the breeding or resting place of bats, (with some exemptions for certain kinds of construction development). Provides for the creation of NHAs.

EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Directive 92/43/EEC), commonly known as the 'Habitats Directive	Lists all the vesper bats in Annex IV as in need of strict protection and also encourages Member States to conserve landscape features such as river corridors, field boundaries, ponds and woodlands. It also requests that Member States establish a system to monitor the incidental capture and killing of the animals listed in Annex IV. The lesser horseshoe bat is further listed in Annex II of the EU Habitats Directive The level of protection offered to lesser horseshoe bats effectively means that areas important for this species are designated as Special Areas of Conservation.
The Convention on the Conservation of European Wildlife and Natural Habitats, commonly known as the 'Berne Convention'.	It obliges states to protect and conserve animals and their habitats, especially those listed as endangered or vulnerable. Also obliges parties to promote national policies for the conservation of wild fauna and natural habitats
The Convention on the Conservation of Migratory Species of Wild Animals, commonly known as the 'Bonn Convention'.	This led to the European Bats Agreement (EUROBATS), which lists a wide range of objectives, including promoting research programmes relating to the conservation and management of bats, promoting bat conservation and public awareness of bats, and identifying and protecting important feeding areas of bats from damage and disturbance.

Habitat & Roosts

Evidence of bat activity associated with potential roost sites includes bat droppings, urine staining, feeding remains and dead/alive bats. Indicators that potential roost locations and access points are likely to be inactive include the presence of cobwebs and general detritus within the apertures. Bats generally make use of large mature trees that contain natural holes, cracks/splits in major

limbs, loose bark, hollows/cavities, dense epicormic growth (bats may roost within it) and bird and bat boxes. The importance of trees to bats varies with species, season and foraging behaviour. Evidence indicating bat presence, includes dark stains running below holes or cracks, bat droppings, odours, or scratch marks.

Bats generally require a variety of elements, that need to be taken into consideration when roosting within a building, these range from temperature and humidity regime within the roost, aspect and orientation of the roost, size of roost, access points, lighting, materials and perching points. Important roosting sites for bats in buildings include crevices in stone work of old and modern structures, crevices in brick work of chimneys, attics of buildings – old and modern buildings – often behind roofing felt, under ridge tiles or in wall cavities and underground structures associated with older buildings.

To maximise warmth, maternity roosts for example are often located on the south and west of houses or close to sources of heat such as chimneys and boilers. Most species prefer to roost in quite small spaces and are not usually found in open draughty areas like barns. Common and soprano pipistrelles for example are generally found in the inaccessible parts of the roof structure and around its edges and rarely enter the loft space. Where bats are seen in buildings during the winter, they tend to be alone or in small scattered groups, hidden in crevices or under slates and away from sources of heat.

Bats will also often use features such as hedgerows, treelines, woodland edges and waterways as commuting pathways between roosts and foraging areas. Sheltering vegetation, such as treelines, not only acts as cover from potential predators and the weather, but also provides structure for acoustic orientation and navigation. Sheltered areas also allow insects to gather and therefore support bat forging. Activities which affect these bat flyways are likely to have consequences for bats.

It is noted that within the development site there are no such features It is noted that most of the immediate surrounding area is heavily urbanised with high light levels and is known that even heavily lit road ways will act as a barrier to commuting bats.

The River Suir, located approximately 260m south of the site has the potential to form an important habitat for bats. It acts as a vegetated corridor along which bats can commute from the wider countryside into the urban environment and vice versa. The riparian habitat also provides a sheltered foraging area, a breeding site for invertebrate prey and, at night, screening from the surrounding artificial lighting of the surrounding urban environment. As a result, the buildings along and in close proximity to these habitats offer potential roosting sites for bats.

There are no buildings suitable for bats within the proposed development. There are no sufficiently mature trees to support roosting bats. A small number of mature oak trees are located adjacent to the southern site boundary which may provide roosting habitat for bats However, as they are located outside the site boundary they will not be impacted by the proposed development.

Lighting within the development site

All bat species are nocturnal, resting in dark conditions in the day and emerging at night to feed. Many species of bats are known to sample the light levels before emerging from their roost; only emerging for their night's hunting when the light intensity outside reaches a critical level after sunset (Swift 1980). Lighting can be particularly harmful to bat populations along river corridors, woodland edges, along hedgerows and treelines and at lake edges. However in the absence of significant feeding or roosting habitat no significant impacts on bats from increased lighting is predicted to occur.

9.3.6.3 Other terrestrial mammals

Twelve other species of terrestrial mammal have been recorded within grid square S02. Six of which are protected under the Irish Wildlife Act; namely Hedgehog, Fallow Deer, Badger, Irish Stoat, Red Squirrel and Pine Marten. Signs of fox were noted within the site and likewise live sightings of rabbits were recorded.

9.3.6.3.1 Badger (*Meles meles*) and their setts are protected under the provisions of the Wildlife Act 1976, as amended, and it is an offence to intentionally, knowingly or unknowingly kill or injure a protected species, or to wilfully interfere with or destroy the breeding site or resting place of a protected wild animal. Badger setts are formed by a complex group of interlinked tunnels, and therefore works in proximity to setts can potentially cause damage a protected species. Badgers are also protected under Appendix III of the Berne.

Badgers are known to occur within the wider landscape (NBDC). Field signs are characteristic and sometimes quite obvious and include tufts of hair caught on barbed wire fences, conspicuous badger paths, footprints, small excavated pits or latrines in which droppings are deposited, scratch marks on trees, and snuffle holes, which are small scrapes where badgers have searched for insects and plant tubers. No signs of badger, were recorded during site survey.

9.3.6.3.2 Fallow Deer (*Dama dama*) are Ireland's second largest deer species and are the most widespread of the deer, found in nearly every county of the island. In Ireland the fallow deer mainly resides in mature deciduous or mixed woodlands which are close to open grassland. Fallow deer is not likely to occur within or in the vicinity of the proposed development site.

9.3.6.3.3 Hedgehog (*Erinaceus europaeus*), also listed on Appendix III of the Berne Convention can be found throughout Ireland, with male hedgehogs having an annual range of around 56 hectares. Due to the habitats recorded within the proposed development site and surrounding landscape, hedgehog is unlikely to occur.

9.3.6.3.4 Irish Stoat (*Mustela erminea hibernica*) is one of the species protected under regulations (Protection of Wild Animals) in 1980 which enabled Ireland to comply with the provisions of the Bern Convention of European Wildlife and Natural Habitats, which was ratified by Ireland in April 1982. Irish stoats occur in most habitats with sufficient cover, including urban areas. Due to the habitats recorded within the proposed development site and surrounding landscape, stoat is unlikely to occur.

9.3.6.3.5 Red Squirrel (*Sciurus vulgaris*) also listed on Appendix III of the Berne Convention can be found throughout Ireland. Red squirrel is known to occur in the wider area (NBDC records). Due to the habitats recorded within the proposed development site and surrounding landscape, this species is unlikely to occur.

9.3.6.3.6 Pine Marten (*Martes martes*) also listed Annex V of the EU Habitats Directive 1992 and Appendix III of the Bern Convention 1979, are habitat specialists, requiring forest or scrub habitat to exist in an area.

Pine Marten have been recorded within 4km of the proposed development site (NBDC). Due to the habitats recorded within the proposed development site and surrounding landscape, this species is unlikely to occur.

9.3.6.4 Reptiles and Amphibians

According to records held by the NBDC, Common Frog (*Rana temporaria)* is the only amphibian recorded from grid square S02. Common Frog is listed on Annex V of the EU Habitats Directive and is protected under the Wildlife Acts. Due to the habitats recorded within the proposed development site and surrounding landscape, this species is unlikely to occur.

Common Lizard (*Zootoca vivipara*) is Ireland's only native terrestrial reptile and is so protected under the Wildlife Act. The species has not been recorded in the surrounding landscape (NBDC). Due to the habitats recorded within the proposed development site and surrounding landscape, this species is unlikely to occur.

9.3.6.5 Birds

The National Biodiversity Centre online data base lists 90 species of bird recorded within grid square S02. Of these species, a number are listed under Annex I of the Birds Directive and are Red Listed Birds of Conservation Concern in Ireland (Colhoun & Cummins, 2013) (**Table 9.7**).

Table 9.7: Bird species listed under Annex I of the Birds Directive and/or classified as Red Listed Birds of Conservation Concern in Ireland recorded within grid square S02 (NBDC records).

Species	Birds Directive Annex	BOCCI
	I	Red List
Barn Owl		X
Black-headed Gull		X
Common Goldeneye		X
Kingfisher	X	

Eurasian Curlew		X
Eurasian Wigeon		X
Eurasian Woodcock		X
European Golden Plover	X	X
Grey Wagtail		X
Herring Gull		X
Little Egret	X	
Meadow pipit		X
Northern Lapwing		X
Northern Shoveler		X
Tufted Duck		X
Whooper Swan	X	
Yellowhammer		X

A bird survey was carried out in conjunction with habitat survey in October 2019. During the survey, all birds seen or heard within the development site were recorded. Signs of birds were also recorded e.g. nests. The majority of birds utilising the proposed works areas are common in the local landscape.

Birds species listed in Annex I of the Birds Directive are considered a conservation priority. During the survey, all birds seen or heard within the development site were recorded. Certain bird species are listed by BirdWatch Ireland as Birds of Conservation Concern in Ireland (BOCCI). These are bird species suffering declines in population size. BirdWatch Ireland and the Royal Society for the Protection of Birds have identified and classified these species by the rate of decline into Red and Amber lists. Red List bird species are of high conservation concern and the Amber List species are of medium conservation. Green listed species are regularly occurring bird species whose conservation status is currently considered favourable. Birds species listed in Annex I of the Birds Directive (2009/147/EC) are considered a conservation priority. Species recorded within the site are shown in **Table 9.8**.

Table 9.8: Bird Species recorded site surveys.

Species		Birds Directive Annex			BOCCI	
		I	II	III	Red List	Amber List
Erithacus rubecula	Robin					X
Larus argentatus	Herring Gull				X	
Turdus merula	Blackbird					
Prunella modularis	Dunnock					
Troglodytes troglodytes	Wren					
Corvus frugilegus	Rook					
Corvus monedula	Jackdaw					
Pica pica	Magpie					
Columba palumbus	Feral pigeon					
Fringilla coelebs	Chaffinch					
Corvus cornix	Hooded Crow					
Parus caeruleus	Blue Tit					
Motacilla alba yarrellii	Pied Wagtail					
Parus major	Great Tit					

Symbol	Description
I	**Annex 1**: species and sub-species are particularly threatened. Member States must designate Special Protection Areas (SPAs) for their survival and all migratory bird species.
II	**Annex 2**: bird species can be hunted. However, the hunting periods are limited and hunting is forbidden when birds are at their most vulnerable: during their return migration to nesting areas, reproduction and the raising of their chicks.

III	**Annex 3**: overall, activities that directly threaten birds, such as their deliberate killing, capture or trade, or the destruction of their nests, are banned. With certain restrictions, Member States can allow some of these activities for species listed here.

Vegetation on the boundaries of the existing site and the early successional, seed producing species found within disturbed ground habitats provide some feeding/nesting resources for birds. Overall, the proposed development site is of local value for terrestrial bird species that are relatively common in the Irish countryside and/or urban areas. There are no terrestrial features or habitats of particular value, which would differentiate the proposed development site from large areas of similar habitat in the surrounding countryside. There may be a short-term impact on feeding patterns during construction but the long-term impact is predicted to be negligible.

9.3.6.6 Other species listed by NBDC as present within grid square S02.

Table 9.9 below lists other species recorded within grid square S02, along with any species considered under threat and provided with legal protection.

Table 9.9: Other species listed by NBDC as present within grid square S02

Species Group	Named species
Annelid	None protected
Bony fish (Actinopterygii)	European Eel - Threatened Species: OSPAR Convention & Threatened Species: Critically Endangered
Conifer	None protected.
Crustacean	Freshwater White-clawed Crayfish - Protected Species: EU Habitats Directive Annex II & V. Protected Species: Wildlife Acts
Fern	None protected.
Harvestman (Opiliones)	None protected.
Horsetail	None protected.
Beetle (Coleoptera)	None protected.
Butterflies	Small Blue - Threatened Species: Endangered. Dingy Skipper & Grayling - Threatened Species: Near threatened.

Caddis fly (Trichoptera)	None protected.
Dragonfly (Odonata)	None protected
Flea (Siphonaptera)	None protected.
Hymenopteran	*Andrena (Andrena) fucata, Andrena (Leucandrena) barbilabris* & Large Red-Tailed Bumble Bee - Threatened Species: Near threatened. *Andrena (Ptilandrena) angustior* - Threatened Species: Vulnerable.
Mayfly (Ephemeroptera)	None protected.
Moths	None protected.
Orthopteran	None protected.
Stonefly (Plecoptera)	None protected.
True fly (Diptera)	None protected.
Liverwort	None protected.
Millipede	None protected.
Mollusc	*Pisidium pulchellum* - Threatened Species: Endangered. Silky Snail - Threatened Species: Near threatened. Brown Snail, Heath Snail & Tree Snail - Threatened Species: Vulnerable.
Moss	Cernuous Thread-moss - Protected Species: Flora Protection Order 2015 Schedule B (Mosses). Threatened Species: Endangered. Tufted Feather-moss & Wulfsberg's Tamarisk-moss - Threatened Species: Near threatened.

9.4 Characteristics of the Proposed Development

Permission has been sought for a karting track development, comprising the following

I. a building comprising changing rooms and a W.C.
II. a building for the storing of and general maintenance of the karts
III. the installation of an over ground gas storage tank for the refuelling of the karts (iv)
IV. perimeter fencing
V. general signage on the building described in item 1 above
VI. general signage on the perimeter fencing
VII. the change of use of the land from industrial to a karting track
VIII. hardstanding of the proposed areas for karting track
IX. general lighting
X. and all other site development works

Refer to **Figure 3.3** for the overall site layout. The development is described in detail in **Chapter 3: Description of Proposed Development** of this EIAR.

9.5. Potential Impacts

Annex III of the amended Directive 2104/52/EU requires that the EIAR should assess:

a) The magnitude and spatial extent of the impact (for example geographical area and size of the population likely to be affected)
b) The nature of the impact
c) The transboundary nature of the impact
d) The intensity and complexity of the impact
e) The probability of the impact
f) The expected onset, duration, frequency and reversibility of the impact
g) The cumulation of the impact with the impacts of other existing and/or approved projects and
h) The possibility of effectively reducing the impact.

The potential impacts of the proposed development on terrestrial biodiversity include:

- Indirect impacts due to increased noise and disturbance during the construction phase of the development

- Indirect impacts on the terrestrial biodiversity due to the spreading of invasive species during site works

- Indirect impacts on aquatic environments could arise during construction from increased run-off of suspended solids or from inadvertent spillages of hydrocarbons during construction works.

- Direct impacts due to be a net, permanent loss of an area of terrestrial habitat

- Indirect impacts due to increased traffic and noise associated with the site could potentially increase levels of disturbance which could result in the disturbance/displacement of birds and mammals.
- Indirect impacts during operation due to increased noise and disturbance.
- Indirect impacts on aquatic environments could arise during operation from inadvertent spillages of hydrocarbons.

9.5.1.1 Impact Appraisal

When describing changes/activities and impacts on ecosystem structure and function, important elements to consider include positive/negative, extent, magnitude, duration, frequency and timing, and reversibility (IEEM, 2016).

Section 3.7 of the Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports', (EPA, August 2017) provides standard definitions which have been used to classify the effects in respect of ecology. This classification scheme is outlined below in **Table 9.10.**

Table 9.10. EPA Impact Classification

Impact Characteristic	Term	Description
Quality	Positive	A change which improves the quality of the environment.
	Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative	A change which reduces the quality of the environment.
	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.

Significance	Moderate	An effect that alters the character of the environment in a manner consistent with existing and emerging 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 most of a sensitive aspect of the environment.
	Profound	An effect which obliterates sensitive characteristics.
Duration and Frequency	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 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	Effects that can be undone.
	Frequency	Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)
	Irreversible	When the character, distinctiveness, diversity, or reproductive capacity of an environment is permanently lost.
	Residual	Degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic	Where the resultant effect is of greater significance than the sum of its constituents.
	'Worst Case'	The effects arising from a development in the case where mitigation measures substantially fail.

9.5.2 “Do Nothing” Scenario

Most of the habitats to be affected have been significantly modified from the natural state by human activity. Disturbed areas and areas that have been left unmanaged are being recolonised by vegetation. The general pattern of succession from recolonising bare ground to patches of grassland to scrub/woodland would be expected to continue. In the absence of development, it is expected that the proposed works areas would largely remain under the same management regimes. No significant changes to the boundary habitats are likely to occur.

9.6 Potential Impacts

9.5.1 Potential Impacts on Terrestrial Habitats

Impacts on terrestrial habitats are generally restricted to direct removal of habitats and possible impacts from the spread of invasive species. Levels of dust during construction are predicted to be low and effectively managed by mitigation. The impact on vegetation in adjoining habitats from wind-blown dust is predicted to be negligible. Based on the criteria outlined by EPA, 2017, as described above, the predicted impacts are detailed in **Table 9.11.**

Table 9.11. Impacts on Terrestrial Habitats

Habitat	Description/ Habitats Directive Annex I Status	Potential Impact
Buildings and artificial surfaces (BL3)	Local importance (Lower value)	Neutral, Not significant, Long term impact
Recolonising bare ground (ED3)	Local importance (Lower value)	Negative, Not Significant, Long term impact
Spoil and bare ground (ED2)	Local importance (Lower value)	Negative, Not Significant, Long term impact
Scrub (WS1)	Limited in extent.	Negative, Not Significant, Long term impact
Treeline (WL1)	Non native species predominant	No impact

9.6.2 Potential Impacts on Fauna

There will be a net loss of most habitat types located within the proposed development site and thus there will be some negative impacts on fauna. Increased noise and disturbance will occur during operation and floodlighting is proposed.

Bats

All bat species are nocturnal, resting in dark conditions in the day and emerging at night to feed. Many species of bats are known to sample the light levels before emerging from their roost; only emerging for their night's hunting when the light intensity outside reaches a critical level after sunset (Swift 1980). When bats emerge from roosts early in the evening, they tend not to echolocate but rely on eyesight to fly from the roost to adjoining treelines or hedgerows. Where there is too much luminance near exist points, a bats vision can be reduced resulting in disorientation. Light near a roost access point will delay bats from emerging and shorten the amount of time available to them for foraging. Any delays of emergence can reduce feeding periods and affect the overall survival rate of bats. Bright light may reduce social flight activity and cause bats to move away from the light area to an alternative dark area. Illuminating a bat roost creates disturbance and may cause the bats to desert the roost.

In addition to causing disturbance to bats in the roost, artificial lighting can also affect the feeding behaviour of bats. In most bat species, there is an evening period of activity followed by another at dawn. These two flights correlate with the peak flight times of nocturnal insect prey. Insects are attracted to light particularly if it is a single light source in a dark area. Artificial lighting can also increase the chances of predation. It is believed that Myotis species shun bright light as a predator avoidance strategy. Many avian predators will hunt bats which may be one reason why bats avoid flying in the day. Lighting can be particularly harmful to bat populations along river corridors, woodland edges, along hedgerows and treelines and at lake edges. In this instance the proposed development site of minimal value for bats and no impact on bats from lighting has been identified.

No buildings will be removed as part of the proposed development and no trees of value as bat roosts will be affected. Overall the impact is predicted to be negligible.

Other Mammals

No mammals or signs of mammals were recorded within the proposed development site which is of negligible value for mammals. In the absence of impacts on water quality or impacts on otter habitat no impact on otter is predicted to occur.

Birds

The terrestrial bird species recorded within the proposed development site during bird surveys are typical of the types of habitat recorded and are generally common. No rare or uncommon species or species of high conservation value were recorded.

In general, the habitats within the development area are utilised by a range of common bird species, are widespread in the surrounding countryside. Overall the impact on birds from the loss of habitat will be a long-term minor impact.

Some disturbance/displacement of feeding birds may occur due to increased noise and disturbance. As the levels of activity will stabilise, birds in the surrounding landscape will be expected to habituate to any increased noise and disturbance. Overall the impact on birds from increased noise and disturbance is predicted to be long-term and slight.

9.6.3 Potential Impacts on water quality

Potential impacts on aquatic habitats which can arise from this type of development include increased silt levels in surface water run-off, inadvertent spillages of hydrocarbons from fuel and hydraulic fluid and increased nutrients from treated waste water.

In the absence of appropriate design and mitigation, high levels of silt in surface water run-off from the construction phase of the development, could theoretically impact on fish species. If of sufficient severity, adult fish could theoretically be affected by increased silt levels as gills may become damaged by exposure to elevated suspended solids levels. Excessive siltation can cause eggs and fry to be smothered. In particular impacts on spawning lamprey and salmonids can be significant. If of sufficient severity, aquatic invertebrates may be smothered by excessive deposits of silt from suspended solids. In areas of stony substrate, silt deposits may result in a change in the macro-invertebrate species composition, favouring less diverse assemblages and impacting on sensitive species. Aquatic plant communities may also be affected by increased siltation. Submerged plants may be stunted and photosynthesis may be reduced.

Inadvertent spillages of hydrocarbons during operation could introduce toxic chemicals into the aquatic environment via surface water run-off or groundwater contamination and have a direct toxicological impact on habitats and fauna.

Issues relating to silt and hydrocarbons, if of sufficient severity, could potentially impact on water quality thus impacting on aquatic ecology in the absence of appropriate design and mitigation. Impacts could occur in relation to aquatic fish and invertebrates and thus there could be impacts on species further up the food chain such as heron, kingfisher and dipper.

However, no watercourses will be directly or indirectly affected. It is noted that the impacts on QIs for the Lower River Suir SAC is specifically addressed by the AA screening report for this application (**Appendix 1**) Following a comprehensive evaluation of the potential direct, indirect and cumulative impacts on the qualifying interests and conservation objectives for Natura 2000 sites , the AA screening report concluded that the proposed development will not have an adverse effect on the integrity of the Lower River SAC or any other Natura 2000 sites.

9.6.4 Potential effects on climate change and biodiversity

The EU Commission guidance document on integrating climate change and biodiversity into environmental impact assessment (EU Commission, 2013) aims to improve the way in which climate change and biodiversity are integrated into Environmental Impact Assessment.

The potential impacts from the proposed development on climate have been specifically addressed by Chapter 7 Air Quality and Climate of this EIAR. No significant interactions between the impacts on biodiversity resulting from this development and climate change have been identified.

9.6.6 Cumulative Impacts

Cumulative impacts on fauna chiefly relate to increased noise and activity levels and potential impacts on water quality. In-combination impacts from noise/disturbance are likely to be most pronounced during construction. This is a short-term impact which will be localised. As this proposed development is not predicted to significantly increase long term noise and disturbance levels post construction. No significant impacts during construction and operation or on water quality will occur and therefore, no significant cumulative impacts have been identified in respect of water quality.

9.7 Mitigation Measures

The likely success of the proposed mitigation measures is high, either in their current form or as they will be adapted on-site to achieve the desired result. The mitigation measures have been drawn up in line with current best practice. It is clear that the mitigation measures are designed to achieve a lowering or reducing of the risk of impact to acceptable levels. The risk that the mitigation measures will not function effectively in preventing significant ecological impacts is low. The following mitigation measures will be implemented.

9.7.1 Protection of habitats

Lighting will be focused away from habitats including mature trees outside the site boundary. Lights will be turned off when not in use and lighting will be kept to the minimum necessary for health and safety purposes.

Habitats that are damaged and disturbed will be left to regenerate naturally or will be rehabilitated and landscaped, as appropriate, once construction is complete. Disturbed areas will be seeded or planted using appropriate native grass or species native to the areas where necessary.

Planted vegetation along the site boundary will be retained.

To prevent Japanese Knotweed or other invasive species from outside the site being inadvertently being brought into the site, the contractor will be required to inspect vehicles before using them on site. Buddliea will be removed from the site via mechanical movement and herbicide treatment if required. Herbicides will only be used in line with manufacturers recommendations and shall take into account the need to avoid impacts on aquatic receptors or adjoining habitats.

9.7.2 Protection of Water Quality and surface water management

Mitigation measures in relation to water quality and preventing impact on aquatic habitats are specified in Chapter 5 Land and soils and water of this EIAR.

9.7.3 Noise

Mitigation measures in relation to noise are addressed in Chapter 4 Noise of this EIAR. No existing or proposed sources have been identified in the local area which could potentially give rise to cumulative noise impacts.

9.8 Residual impacts

Overall the development will impact primarily on low value habitats. No direct impact on aquatic habitats will occur. No particular difficulties in the effective implementation of the prescribed mitigation measures have been identified. No significant invasive species were recorded within the proposed development site boundary.

The impacts on habitats will be slight in the long-term. The proposed development will result in the loss of some feeding habitats for bird species. It is considered probable that these species will be displaced into the surrounding countryside. The impact of the proposed development of birds and mammals is predicted to be localised and minor.

During site development and operation, there will be increased noise and disturbance which could potentially impact on birds and mammals. However, such impacts will be slight in the context of existing noise levels close to an urban centre

The project design has taken into account the necessity to protect surface water from impacts associated with construction works and operation of the proposed development. Appropriate mitigation measures and operational procedures have also been specified within this EIAR. The impact on water quality is predicted to be imperceptible in the long-term.

9.8 References

EPA (2002) Guidelines on the information to be contained in Environmental Impact Statements. Environmental Protection Agency.

EPA (2015) Revised Guidelines on the Information to be Contained in Environmental Impact Statements (Environmental Protection Agency, draft September 2015);

EPA (2015) Advice Notes for Preparing Environmental Impact Statements Draft September 2015

European Union (2013) Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment

Fossitt J A (2000) A Guide to Habitats in Ireland .The Heritage Council, Kilkenny

Best Practice Guidance for Habitat Survey and Mapping (Heritage Council, 2011)

Kelleher, C. & Marnell, F. (2006) Bat Mitigation Guidelines for Ireland. *Irish Wildlife Manuals*, No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Lynas, P., Newton, S.F. and Robinson, J.A. (2007). *The status of birds in Ireland: an analysis of conservation concern 2008-2013*. Irish Birds 8:149-166

NRA (2005a). Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes. National Road Authority.

NRA (2005c). Guidelines for treatment of bats during construction of National Road Schemes. National Road Authority

NRA (2009). Guidelines for assessment of ecological impacts of National Road Schemes. National Road Authority.

NRA. (2006b). Guidelines for the protection and preservation of trees, hedgerows and scrub prior to, during and post construction of national road schemes. National Roads Authority.

NRA (2006c). Guidelines for the treatment of badgers prior to the construction of national road schemes. National Road Authority.

Webb, D.A., Parnell, J. & Doogue, D. (1996) An Irish flora. Seventh edition. Dundalgan Press (W. Tempest), Dundalk.

IEEM (2006 and 2016) Guidelines for ecological impact assessment in the United Kingdom.

Chapter 10 – Landscape and Visual Impact

10.1 Introduction

This EIAR Chapter was prepared by DixonBrosnan and identifies, describes and assesses the likely impacts on landscape from the proposed development

The term ‘landscape’ refers primarily to the visual appearance of an area. It includes its shape, form and colour and the interaction of these elements to create specific patterns that are distinctive to particular localities. Landscape is also not purely a visual phenomenon as its character relies closely on the local physical geography and environmental history. Besides any scenic and/or visual dimension, there are also a whole range of other constituents of significance. These include:

- Topography
- Ecology
- Landscape history
- Land use
- Buildings and settlement
- Architecture

This section examines the potential impacts that may impinge on the landscape and visual characteristics of the locality, setting out how the proposed development interacts with them and specifying any significant environmental effects. Measures proposed to mitigate these effects are also provided and consideration is given to both the construction and operational phases

10.2 Study Assessment and Methodology

A desktop study was undertaken to determine the existing landscape of the area and visual envelope for the proposed development within the wider landscape. The cumulative impact with regard to other developments within the landscape was also assessed. The patterns and scale of the landscape character including landform, landcover, land use and built development was determined using Ordinance Survey Ireland (OSI) Discovery Series Mapping of the area and available aerial photography of the site.

Landscape values such as amenity areas, designated views and prospects, and historical archaeological and architectural heritage in the vicinity of the proposed quarry were identified using mapping provided in the Tipperary County Development Plan 2016

10.2.1 Field Survey

The site was visited in October and November 2018 to identify visible sensitive receptors outside the site boundary. Based on the result of the field surveys and desktop study, a number of viewpoints were selected which are representative of views from sensitive receptors in all directions from the proposed development.

10.2.2 Visual Impact Assessment

The landscape impact assessment describes the nature and scale of changes to the landscape elements and character and outlines the effect of the proposed development on the landscape character of the area. Landscape impacts may be viewed as positive, neutral or negative.

Magnitude of Change

The magnitude of the effects from the proposed development on landscape are rated as follows:

- *No change* – very minor loss or alteration to one or more key elements/features/characteristics of the baseline i.e. the introduction of elements that are not uncharacteristic of the surrounding landscape
- *Low* – minor loss or alteration to one or more key elements/features/characteristics of the baseline i.e. the introduction of elements that are not uncharacteristic when set within the attributes of the receiving landscape
- *Moderate* - partial loss or alteration to one or more key elements/features/characteristics of the baseline i.e. the introduction of elements that may be prominent but may not necessarily be considered to be substantially uncharacteristic when set within the attributes of the receiving landscape
- *High* – total loss or major alteration to one or more key elements/features/characteristics of the baseline i.e. the introduction of elements considered to be totally uncharacteristic with the surrounding landscape

The significance of the change to the landscape is dependent on the sensitivity of the landscape or viewer and the magnitude of the change.

Significance of Change

The visual impact assessment describes the existing viewpoints and evaluates the visual effects or changes in the selected viewpoints of the proposed and existing development. Visual impact may occur by means of intrusion and/or obstruction. These terms can be defined as:

- **Visual Intrusion –** an impact on a view without blocking; and
- **Visual Obstruction –** an impact on a view involving blocking thereof.

Due to the nature of the development only visual intrusion is anticipated. Section 3.7 of the Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports', (EPA, August 2017) provides standard definitions which have been used to classify the impacts in respect of landscape. This classification scheme is outlined below in Table 10.1.

Table 10.1. EPA Impact Classification

Impact Characteristic	Term	Description
Quality	Positive	A change which improves the quality of the environment.
	Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative	A change which reduces the quality of the environment.
Significance	Imperceptible	An effect capable of measurement but without significant consequences.
	Not Significant	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	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 consistent with existing and emerging 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 most of a sensitive aspect of the environment.
	Profound	An effect which obliterates sensitive characteristics.
Duration and Frequency	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 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	Effects that can be undone.
	Frequency	Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)
	Irreversible	When the character, distinctiveness, diversity, or reproductive capacity of an environment is permanently lost.
	Residual	Degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic	Where the resultant effect is of greater significance than the sum of its constituents.
	'Worst Case'	The effects arising from a development in the case where mitigation measures substantially fail.

10.3 Receiving Environment

10.3.1 Site details

Cahir town was originally established on the banks of the River Suir in the 13th century and Cahir castle which dates to that period still stands today. Cahir's historical significance is recognised in its designation as one of Bord Failte's (Failte Ireland) Heritage Towns (scheme under the European Regional Development Fund Initiative (1995-1999)) and historic buildings are important part of the historical and cultural landscape. Cahir Castle, which dominates the town centre, Cahir Abbey, Quaker Mills, Dovecote and the Georgian and Victorian streetscape all add significantly to the historic character of the town.

Cahir is located in the lowlands of the Suir river valley. The topography to the east to the town is dominated by land rising steeply along the foothills of the Galtee Mountains which run southwest towards Mitchelstown. The Knockmealdown Mountain range is located approximately 13km to the south (**Figure 10.1**).

Cahir is located on the junction between the M8 Dublin-Cork Motorway and the N24 Limerick-Waterford National route and on the Waterford-Limerick railway line. It is one of the five main settlements in South Tipperary, alongside Clonmel, Carrick on Suir, Tipperary Town and Cashel. The M8 runs north towards Cashel (approx. 14km NNE) and southwest towards Mitchelstown (approx. 26km SW). The N24, located on the northeast corner of the town, runs southeast to Clonmel (approx. 16km SE) and northwest to the village of Bansha (approx. 12km NE) and Tipperary Town (approx. 19km NE). The smaller regional roads of the R639, R640, R670 and R668 traverse the centre of the town.

The proposed development site is located on the edge of Cahir town, just over 1km NNW of the town centre within the Cahir Abbey Industrial Estate. The entrance to the industrial (and the proposed development site) is from the Upper Abbey Road. The proposed development is located to the northeast of an industrial unit for which planning has been submitted (planning ref:17600012). Further details on this are included in **Table 2.1**. There are additional industrial units used by the applicant located to the north east of the proposed development. Cahir Abbey Industrial Estate is home to a number of industrial and commercial units.

The former Roadstone Quarry is located to the east and north/east of the development site. The quarry has been inactive for several years. There is an existing lagoon associated with the former quarry works which is located 100m north from the proposed development site.

On the western side of the industrial estate, residential development extends along both sides of the R640. This residential development is formed by a mixture of period dwellings, small residential estates, and one-off dwellings. To the north of the industrial estate, as the R640 approaches the R639, the landscape becomes more open and begins to rise gradually, and the urban environment gives way to scattered one-off dwellings.

One of the most significant local features is Cahir Abbey House, a period dwelling lying 190m south of the proposed track. The house and associated outbuildings, including an intervening

enclosed garden with 4 m walls, occupies a large site between the industrial estate and the River Suir.

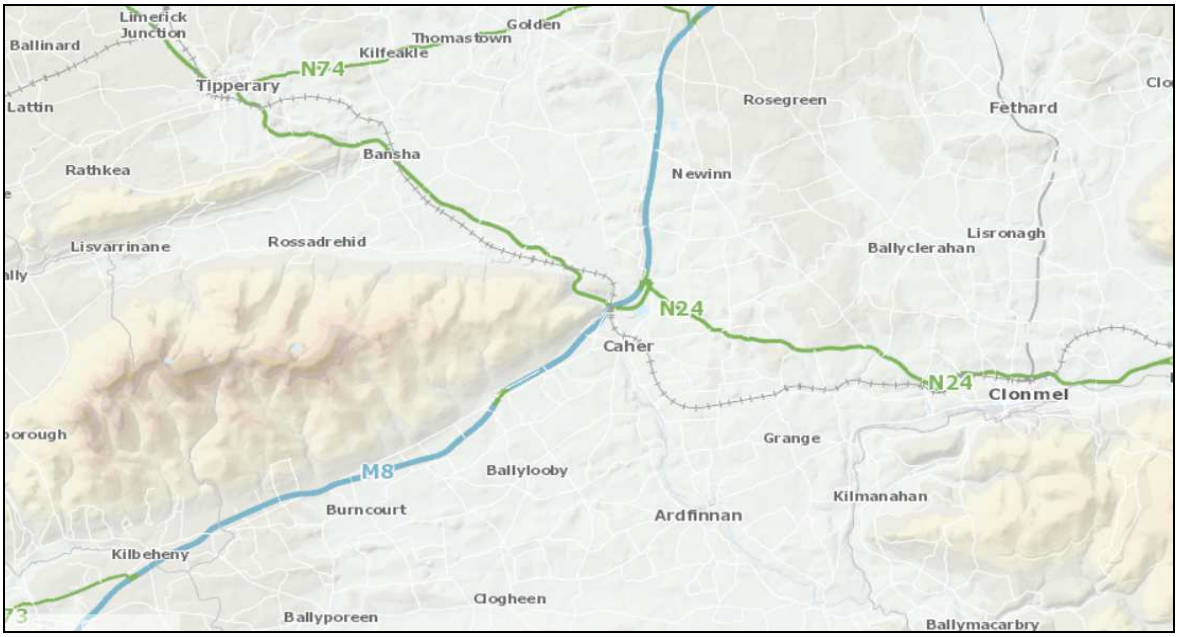


Figure 10.1. Cahir and surrounding landscape

10.3.2 Proposed development

Permission has been sought for a karting track development at Cahir Abbey Industrial Estate, Cahir, Co. Tipperary. The proposed development will comprise the following;

1) a building comprising changing rooms and a W.C.

2) a building for the storing of and general maintenance of the karts

3) the installation of an over ground gas storage tank for the refuelling of the karts

4) perimeter fencing

5) general signage on the building described in item 1 above

6) general signage on the perimeter fencing

7) the change of use of the land from industrial to a karting track

8) hardstanding of the proposed areas for karting track

9) general lighting

10) and all other site development works

It is proposed to install an outdoor karting track at the southeast corner of the site (**Figure 10.2**). The track will consist of a tarmac area at the centre of the proposed development site. While the shape of the hardstanding area in **Figure 10.2** will remain constant, the layout shown will change weekly to give varying degrees of complexity for users. Although operating times of 1200-2200 h Monday-Sunday are proposed, including public holidays, it is likely that the track will be idle for much of the time. The peak time of activity is expected to be Saturday 1200-1800 h, and during these hours the track is likely to be in use almost continuously apart from initiation periods at the start of each race.

The karts will use four-stroke gas-powered internal combustion engine karts with a likely engine capacity of 270 cc. The track will be restricted to a maximum of 10 karts at any time. Maintenance activities undertaken within a proposed workshop near the northeast corner.

Construction is expected to take four months, beginning in March and completing in June 2020.

No new car parking spaces will be required. An existing car park, owned by the applicant, at the south west corner of the proposed development site will be used for visitors and staff.

An acoustic barrier will be erected at the southwest corner in front of the existing weldmesh fence. This Woodfab acoustic barrier will consist of a solid absorptive proprietary screen of height 2 m and posts of 3 m. Absorptive barriers are designed to insulate against noise and absorb sound that strike them. Through laboratory testing, a performance coefficient of A4 (high coefficient) has been assigned to this barrier. The barrier will provide acoustic screening with respect to the kart collection area, and the southern segments of the track.

The track with the bounded on all sides by a grassy verge. Clusters of rowen, hawthorn and common cherry are planted along the south eastern boundary of the site as specified in a previously granted planning application (ref. number 17600012). These trees are underplanted with laurel and holly to form a dense thick screen. Under planting should reach a height of 2.5-3.5 m within three years of planting. These trees are required to be maintained indefinitely and replaced if failure occurs.

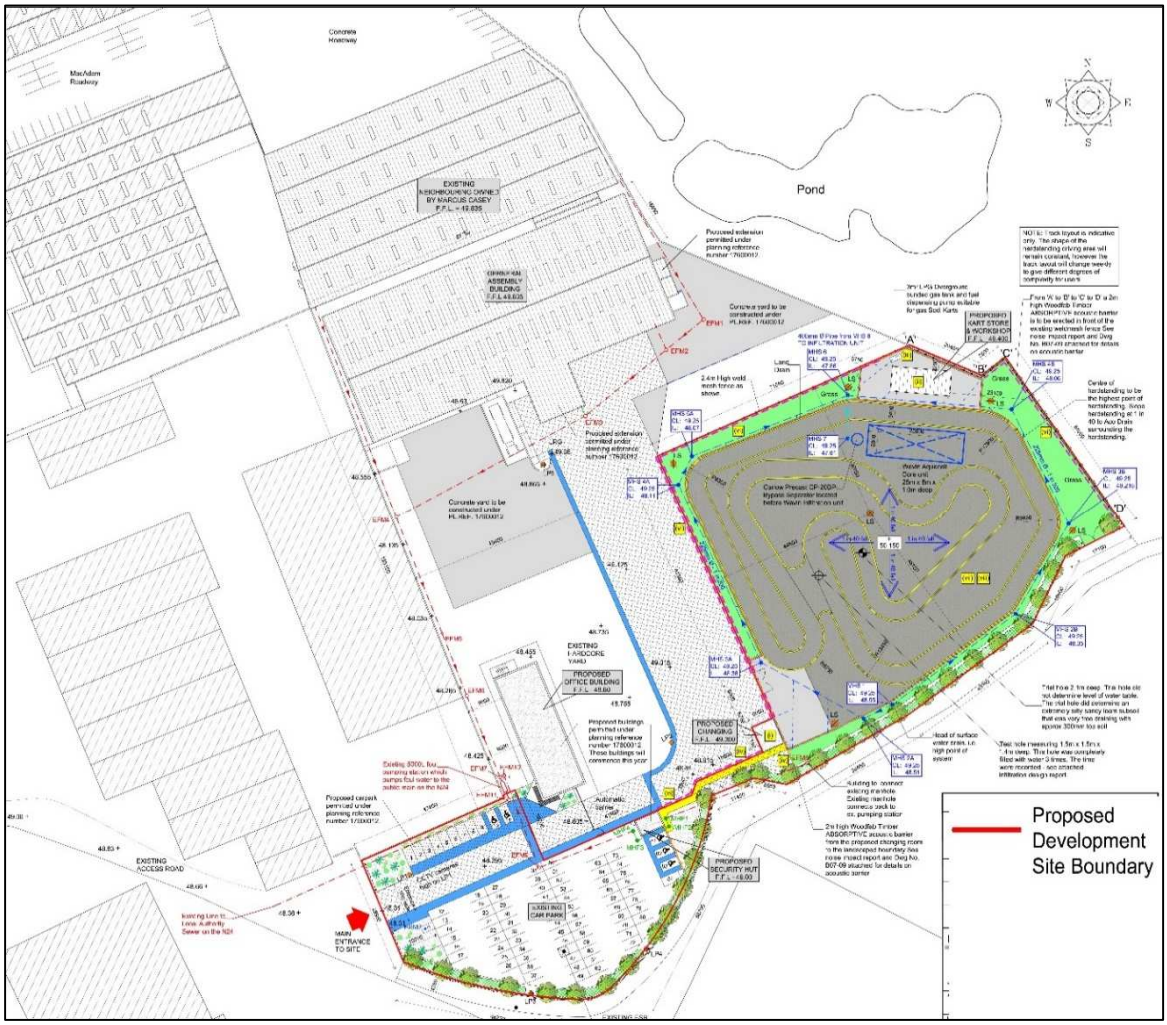


Figure 3.3. Site layout

10.3.3 Landscape character

The EPA document 'Advice notes on current practice in the preparation of environmental impact statements' notes that landscape in the existing environment may be examined in two contexts: the landscape character (incorporating land use) and visual significance. Both aspects are addressed below:

Cahir town is located in the *Urban Fringe* as categorized by *Tipperary Draft Landscape Character Assessment* (2016). Towns represent the largest settlements of the county and due to their size relative to the smaller county settlements, they are considered to have an urban character that sets them apart from the surrounding rural hinterland. The settlements identified above share many very similar characteristics notably their locations on areas of level topography. Many of the towns also have fortified structures and castles. The growth and development of the towns is considered an integral element of the character of the county.

The landscape around Cahir is dominated by two major geographical features; the River Suir and the Galtee Mountains (**Figure 10.2**). The *Tipperary Draft Landscape Character Assessment* (2016) categorises the lands to the north, east and south of Cahir town as 'River Suir Central Plain'. This area is probably better known as the Golden Vale for the rich agricultural grassland which dominates the landscape. The landscape is characterised by wide rolling vistas with large fertile fields, surrounded by dense hedgerows. This low lying, undulating landscape forms the vast central area of Tipperary county, where it is associated with the River Suir and also extends west along the tributaries of the Multeen, Thonouge and Tar and eastwards along the Anner.

The lands to the west of Cahir form part of the 'Galtee Mountains Mosaic'. This upland area is dominated by moorland, forestry and marginal pasture. It comprises the southern face of the Galtee mountains including an extensive area of cSAC designated land, the Galtee Mountains SAC (See **Appendix 1,** AA Screening report for further details). The area is characterised by steep, forested slopes and glacial valleys rising up from the surrounding plains towards towering peat and moorland covered peaks. Due to the area's limited land capability (shallow, nutrient poor soils), the once typical marginal mountain mosaic of pasture and moorland has largely been replaced by the modern forestry.

Figure 2.2. Aerial view of proposed development site and surrounding landscape.

Due to the topography within the region, extended views are mainly permitted only from higher elevations, largely along the Galtee foothills to the west of the town. Regional routes R670 (N8) extends to the northeast and south of the town, and parts of this route has views which extend

several kilometres towards the Galtee Mountains. The proposed development site is only visible from the higher ground to the west of the town, along a minor road (Abbey Road Upper), which is included in part of the Tipperary Heritage Way walking trail.

Land use to the south, east and north of Cahir is dominated by intensive agricultural activity, chiefly dairy and cattle with some tillage. The high soil quality is reflected in an absence of scrub, unworked land and commercial forestry. The landscape is criss-crossed by a network of boundary hedgerows, many with mature deciduous trees. While hedgerows have been removed across a number of farms, this activity is not as pronounced as seen in other intensively farmed areas. This contrasts with the land use to the west of the town, which is dominated by commercial forestry, marginal pasture and moorland.

Landscape features of significance are as follows:

- The historic town of Cahir located on a flat plain
- Galtee foothills to the west of the town.
- Historic buildings within the town
- Mature trees within boundary habitats.
- Disused quarry located adjacent to the proposed development.

No significant historical buildings within the town or surrounding area have views of the proposed development site. There are a number of dwellings located along the R640, 280-300 m from the proposed track. The number of dwellings within 500 m exceeds 150, with the majority of these lying along or close to the R640 to the west and southwest of the site. None of these is afforded views of the site due to screening provided by existing buildings at the industrial estate. A number of houses on the hillside 1 km to the northwest and a minor road (Abbey Road Upper) are afforded partial views over the study site.

10.3.4 The Visual Context

The local landscape is urban in character. The proposed development site is located on the north-eastern edge of Cahir town. Cahir, with an approximate population of 3,600, is the only settlement in the immediate study area. The *Cahir Local Area Plan* (2011) divides the town into several zones These include the town centre, existing and new residential areas, an office development area, an integrated tourism venue, light industrial and employment areas as well as general industrial and amenity areas. The proposed development site is located in an area zoned for light industrial and employment use.

The built environment in the immediate vicinity of the site features several purpose-built industrial units, which are occupied by retail and light industry. A small strip of agricultural grassland is located to the south of the proposed development site, which separates the site from the River Suir, located approximately 290m to the south. Residential areas near the proposed development site can be divided into three district areas.

- The first area, located approximately 250m west of the proposed development site, is centred around Abbey Street. Dwellings here, a mix or modern and historical, are located on either side

of Abbey street which runs in an approximately north-south direction. There are also a number of small housing estates to the west of the street; Avondale Close, Abbey Cresent and Woodview.

- The second area is located approximately 1.6km southeast of the proposed development site. Located to the south of the River Suir and the north of the Cahir-Clonmel road (R640), this area is accessed via the R670 and R640 There are several housing estates located in this area including Butler's Court, Hillview, Lake View, Woodland and Dún Uisce. There is also a playground, a leisure centre and a school located in this area.
- The third area is located approximately 1.3km southwest of the proposed development site. This has a small number of residential dwellings has been zoned for future residential development.
- Cahir town centre is located approximately 1km south of the proposed development site. This is based around the primary retail area of Castle Street and the Square. This area contains a mix of services and uses, mainly retail/commercial, residential and recreational.

The *Cahir Local Area Plan* (2011) notes the following with regard to industry and tourism:

It is a strategic objective of this Local Area Plan to both capitalise on the advantages possessed by Cahir by virtue of its location on the M8 Dublin – Cork National Route, the N24 Waterford – Limerick National Route and on the Waterford – Limerick Railway Line in terms of attracting industry and employment opportunities. In addition this LAP aims to facilitate and guide the development of additional attractions and facilitates to encourage tourists to extend their stay and increase expenditure in the town.

It is noted that the proposed development is in line with these strategic objectives. While there are currently no plans for residential developments in the immediate vicinity of the proposed development site, the *Cahir Local Area Plan* (2011) has set out a number of specific residential development objectives. One of these (HSG1) is at the former Roadstone Quarry, located to the immediate east of the proposed development site. This is zoned for 'Integrated Tourism and Recreation'. The objective is to support the development of the Roadstone site for a limited amount of low-density residential development, which would be ancillary to an integrated, tourism, recreational or waterside developments.

South Tipperary contains a rich and varied landscape and a wealth of heritage assets that form the basis for the high level of amenity in the county. While the county development plan does not include any specific designations for the proposed development site or any adjacent lands, large parts of Cahir town centre have been designated as an Architectural Conservation Area (ACA). ACA's are places, areas, groups of structures or townscapes, that are of special architectural, historic, archaeological, artistic, cultural, scientific, social or technical character, or that contribute to the appreciation of a protected structure.

10.4 Potential Impacts

Visual impacts will be primarily related to the development of the track and associated structures which will necessitate the changes in the existing landform. Minor visual impacts may relate to the storage of material during construction. No changes in the visual impact associated with the

existing buildings are predicted to occur. The nature of the local landscape is such that changes to its character may be visually obvious depending on their size and similarity to existing features.

Overall the visual impacts resulting from the proposed development will not differ significantly from the impact associated with the existing site although activity levels will increase during the periods that the track is operational. The proposed development will have the greatest impact, although slight, on views from the houses on the hillside 1 km to the northwest which are afforded views over the study site. However, it is noted that the track will be constructed on flat ground and thus the only elevated structures are the new buildings. Given the low visibility of the proposed development no impact on tourism or the visitor experience is predicted to occur.

Figure 10.3 Zone of visual influence. Proposed development area outlined in red. The area to the north west has distant oblique views from elevated ground. Views from the minor road are distant and sporadic due to roadside vegetation.

Photo 10.1 View from Upper Abbey Street on elevated ground, site screened by business park

Photo 10.2 Upper Abbey Street – views of development screened by Cahir Business Park and road side vegetation

Photo 10.3 Looking north and west from the southern boundary. Five houses in the distance will have distant and partial views of the proposed development.

10.5 Mitigation

The track with the bounded on all sides by a grassy verge. Clusters of rowen, hawthorn and common cherry are planted along the south eastern boundary of the site as specified in a previously granted planning application (ref. number 17600012). These trees are underplanted with laurel and holly to form a dense thick screen. Underplanting here is 2.5 m thick and 1.5 m high. Under planting should reach a height of 2.5-3.5 m within three years of planting. These trees are required to be maintained indefinitely and replaced if failure occurs. Given the negligible visual impact associated with the project retention of this vegetation is considered the only mitigation required.

10.6 Residual impacts

Guidance on the EIAR is provided in *Guidelines on the information to be contained in environmental impact statements* (2002) *Advice notes on current practice in the preparation of environmental impact statements* (2003), Guidelines on the information to be contained in Environmental Impact Assessment Reports draft (2017) and Advice notes for preparing Environmental Impact Statements Draft (2015). The EPA notes that visual impacts may be

described as positive, negative or neutral, and quantified as slight, moderate or substantial. Thus visual impacts may range from substantial negative to substantial positive. Neutral impacts indicate a change which does not affect visual context. Residual impacts are identified in **Table 10.1.**

Table 10.1: Residual visual impacts

Area	Focus	Impact
Minor road (Abbey Street Upper) and dwellings to the northwest	Distant views of proposed development which will not be a visually intrusive element in the context of an existing industrial estate. Views from the road are distant and the development is only observable from the road through small gaps in existing vegetation on roadside banks.	Approximately 5 dwellings will be affected and the overall impact will be **negative, long-term and Not Significant.** Similarly views from the minor road will be **negative, long-term and Not Significant.**

10.7 Conclusion

Overall, the visual impact resulting from the proposed development will not differ significantly from the impact associated with the existing industrial estate. For most of the dwellings and roads in the area, the proposed development will not be seen and the proposed development will not be an intrusive element in the context of the existing landscape.

Specifically, the visibility of the proposed development will be considerably reduced by a combination of the following:

- Panorama scale: The proposed development will constitute a negligible feature in the context of the existing town.
- Size: The proposed development will occupy a small section of an existing industrial estate. However, due to topography, only certain parts of the proposed development will be visible from any given direction.
- The most obvious visual impact is on dwellings to the northwest; however, these houses have distant or partial views.
- It is also noted that *in situ* planting will reduce the visual impact overtime.
- cumulative impact associated with the disused quarry and existing industrial estate and urban centre within this area will not be significant.

Based on the above it is concluded that the development as proposed will not have a significant impact on views or on amenity value and the overall impact on the landscape will be slight.

11. Archaeology & cultural heritage

11.1. Introduction

This report was compiled by Rose M. Cleary, MA, MIAI, FSA at the request of Howick O'Brien & Co. Ltd, agent for Buttimer Engineering to assess the archaeological component of a proposal for a karting track at Cahir Business Park in the townland of Caher Abbey Upper, Cahir (**Figures 11.1 and 11.2**).

The proposed development site outside the Zone of Archaeological potential of

(a) the historic town of Cahir, a Recorded Monument (RMP[ii] TS 075-048), and,

(b) north of Cahir Abbey, a Recorded Monument (RMP TS 075-048-02),

as listed in The Archaeological Survey, for County Tipperary (South Riding)[iii].

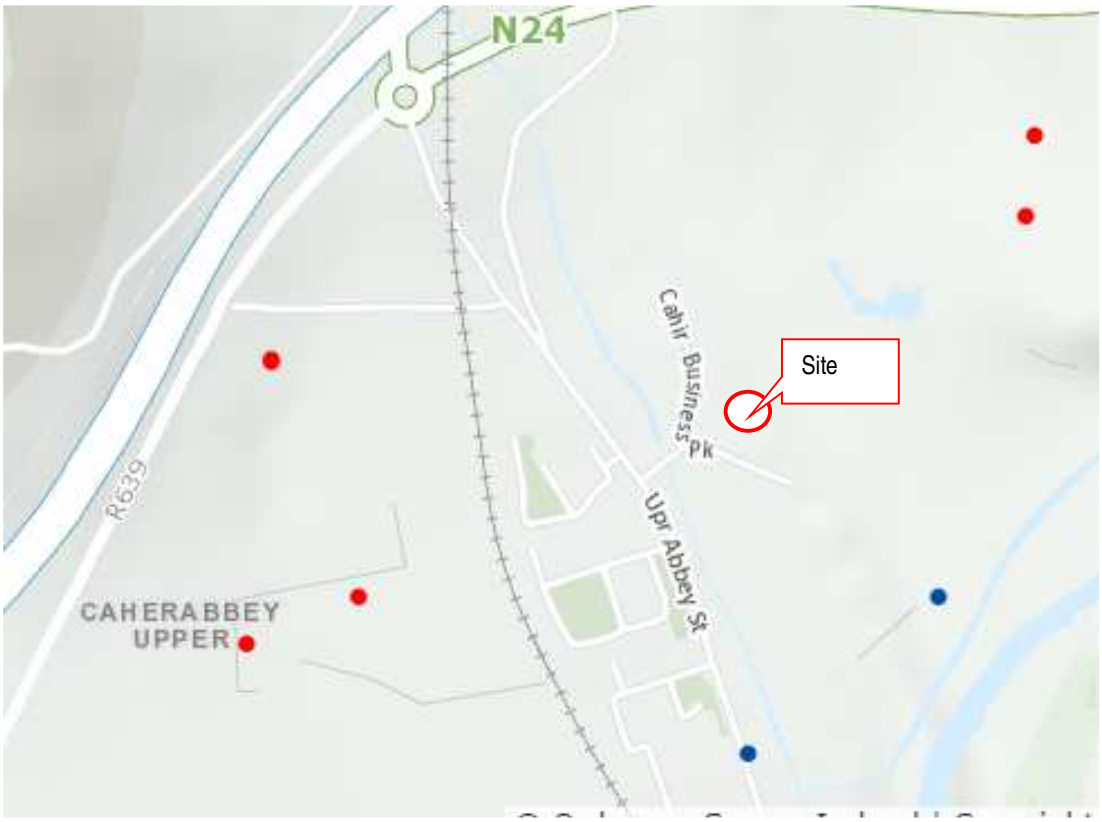


Figure 11.1: Site Location.

11.2. Site Development

This submission to An Bord Pleanála is in relation to an application for the development of a karting track at Cahir Business Park, Upper Abbey St., Cahir. The proposed development is on a brown-field site. Previous work on the site included some reduction of ground levels and laying of a temporary surface of stone chippings.

Figure 11.2: Site location

11.3. Site location

The development is located to the north of the centre of Cahir town and on the east side of Cahir Business Park. The site is on the east side and off street of Upper Abbey St. The cartographic evidence on the First Edition Ordnance Survey map (*c.* 1844) shows some ribbon development along the street and these houses appear to be mainly along the east side of the road (**Figure 11.3**). Caher Abbey House was built at the time the area was mapped by the Ordnance Survey in the early 1840s. The Second Edition Ordnance Survey (*c*. 1905) shows further ribbon development along Upper Abbey Street with a number of houses along the west side and more houses along the road on the east side (**Figure 11.4**). There are no archaeological sites shown on either map within the proposed development zone.

Figure 11.3: First edition OS map (c. 1844)

11.4. Site description

The proposed site is to the west of a redundant quarry and separated from the quarry and Cahir Abbey House by a quarry access road. Existing buildings and the proposed track development are screened on the east side from Caher Abbey House by judicious planting (**Figure 11.5**). The development is bounded on the west and north-west sides by existing buildings (**Figures 11.6-11.8**). The surface of the development area is covered by stone chippings (**Figure 11.9**) and a concrete surface (road) skirts along the west and north side of the site (**Figure 11.10**). It is assumed that ground preparation works for the stone surface and concrete road involved topsoil stripping and site levelling.

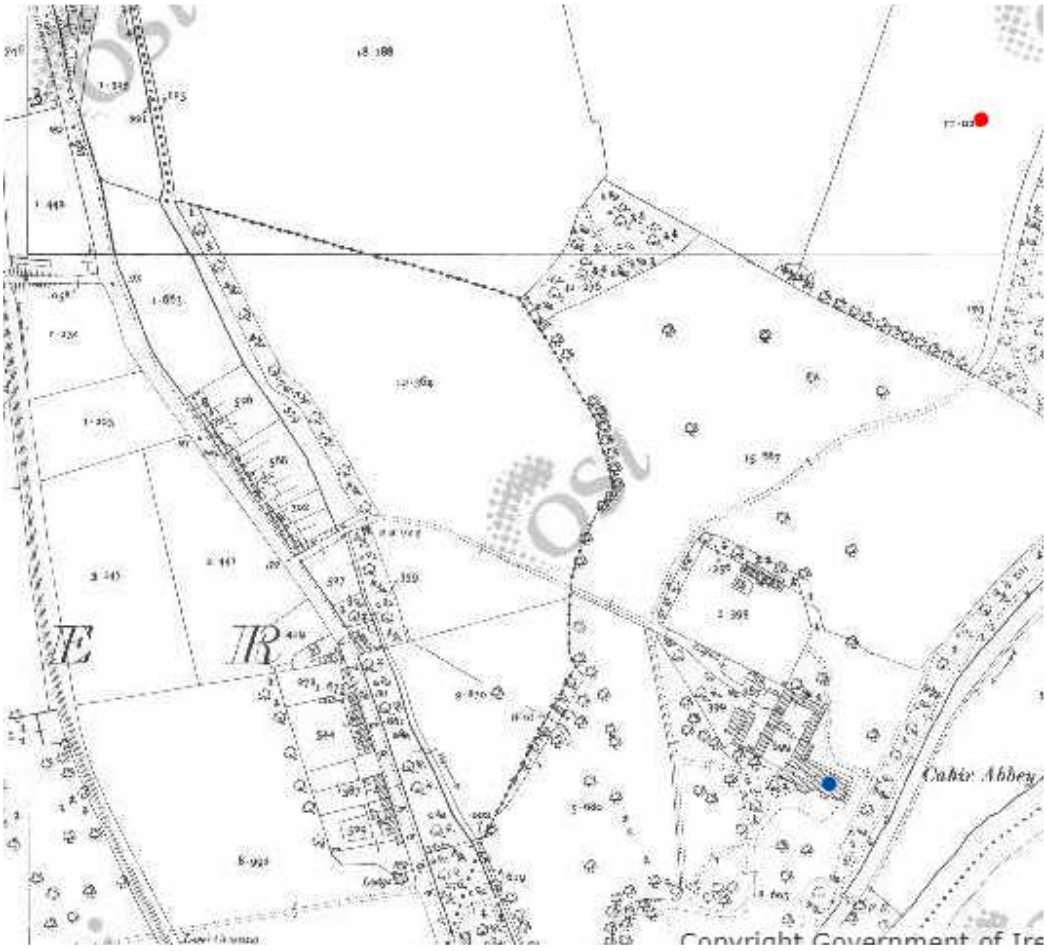


Figure 11.4: Second edition OS map (*c.* 1905)

11.5. Development proposal

The present application is for the development of a karting track including ancillary structures (security hut, office building and kart store). This will involve reduction of ground levels during the construction of the track and ancillary buildings (**Figure 11.6**).

11.6. General archaeological and historical background

The historic town of Cahir (RMP[iv] TS075-048) is located on the River Suir. The Irish name 'caher' denotes a fortification and historic records confirmed the destruction of a fort in the third century AD (Burke 1909). The lands around Cahir were initially granted to the Anglo-Norman adventurer William de Braos in 1169 and thereafter to Philip Worcester in 1215 and the estates then passed to the Birminghams, who held the area until 1332. In 1375 the manor of Cahir was bestowed on James Butler, Earl of Ormond, in whose family it remained almost continuously up to the twentieth century. Cahir town is dominated by the imposing castle (RMP TS075-048). James Butler or his son James began the castle construction on a rock beside the Suir River. The present upstanding castle is mainly of fifteenth century construction but a sequence of construction phases including

the conversion of the great hall into a church in 1842 have added to the original site. The castle is surrounded by a massive bawn wall with square and round flanking towers. Two courtyards, a hall and a tower house occupy the enclosed area.

Figure 11.5: Trees planted along the eastern boundary

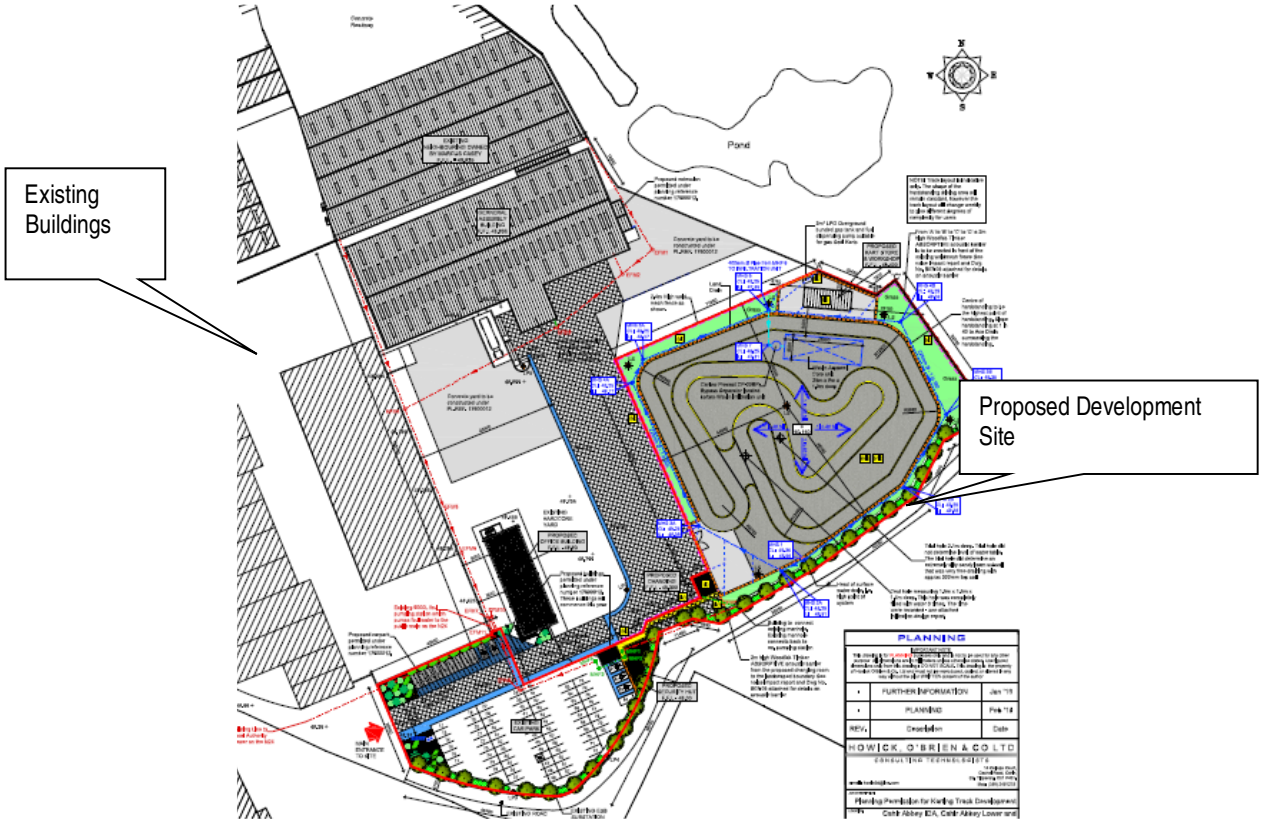


Figure 11.6: Existing buildings and access road on west and north-west side of proposed development

The castle was besieged for ten days but eventually taken by the Earl of Essex in 1599 but remained in Butler hands. Cromwell took the castle in 1650 and again it was returned to the Butlers. A nucleated settlement may have grown up around the castle but the precise location is unknown.

The location of the Augustinian abbey to the south of the proposed development suggests that this area of Cahir was outside a nucleated settlement as the Augustinians and other mendicant orders avoided towns and preferred the countryside for their abbeys and friaries. The abbey itself (RMP TS075-048) was founded Geoffrey de Camville about 1200 for the Augustinian Canons and dedicated to St. Mary. In 1540 the prior Edmund Lonergan surrendered the monastery to Henry VIII. The abbey remains consist of a church and a range of buildings to the south including a large vaulted chamber, a tower and the possible remains of the refectory. The associated graveyard (RMP TS075-048-015) to the west of the abbey includes eighteenth to twentieth century memorial grave-markers.

Another building of medieval date is the medieval parish church (RMP TS075-048-003) on the Clonmel road. The church is now ruinous but was in use until 1820 for Church of Ireland service. The original structure was probably built in the fourteenth century under the patronage of the Butlers. The church included a residence for the priest which is now gone, a bellcote and a graveyard on the west side. Architectural features such as some of the windows indicate that the church was remodelled in the fifteenth or sixteenth centuries.

Many of the prominent buildings in Cahir date from the early 1800s. The public buildings include the John Nash designed St. Paul's Church (Reg^{v}. No. 22111019) and the Erasmus School (Reg. No. 22111014); the Swiss Cottage (Reg. No. 22208107) was also designed by Nash and was a cottage ornée for private use. The modern town of Cahir was designed by William Tinsley in the early 1800s for Richard Butler, Earl of Glengall and included the Square and some of the buildings that front onto the square and Caher House (now a hotel).

Recorded archaeological sites and structures of architectural interest in the environs of the development (Figure 11.11)

The development site has no recorded archaeological sites. Aerial photographic coverage in the late 1980s did not detect any low-visibility archaeological sites when the site was still greenfield and there are no sites recorded on site by the Ordnance Survey (*c*.1844 and 1905). The Holy Well (*Tobar Iosa*) is the earliest recorded archaeological monument in the environs of the development. The site (RMP TS 075-044) may date to the fifth century AD or later. Holy Wells are associated with the Christian rite and the origin may go back to pagan times when the veneration of water gods was a pagan ritual. Holy Wells are frequently associated with Early Christian and medieval monasteries and pilgrimages to the sites continue up to modern times on the feast days of the saints associated with the wells. The waters of some wells are also thought to have curative powers. A Celtic Cross slab (RMP TS 075-044-002) at the holy well (*Tobar Iosa*) was transported to the site in the early nineteenth century. A seventeenth century headstone (RMP TS 075-081) is embedded in a wall to the south of the Holy Well and is also *ex situ*.

A rectangular crop mark to the east of the development was detected via aerial photography and is likely to have been the site of a medieval moated grange (RMP 075-080). Moated sites are settlements by Anglo-Norman farmers who followed in the wake of the Anglo-Norman conquest and are typically rectangular enclosures surrounded by a bank and fosse. An old field system (RMP TS 075-080-001) was also recorded via aerial photography to the east of the development and was probably associated with Anglo-Norman farmers; the field system was removed during quarrying. A burial ground (RMP TS 075-041) was uncovered during quarrying in 1988 and thirty human skeletons were excavated from within a circular enclosed area; these dated to AD 631–941 (Cahill and Holland 1989). A grist mill (RMP

Figure 11.7: Existing buildings on west side of proposed development

Figure 11.8: Existing building on north-west side of proposed development

TS 075-048-005) to the south of the development was probably part of the Augustinian Priory farm enterprise.

The architectural heritage in the environs of site comprises three sites of early nineteenth century date. Caher Abbey house (Reg. No. 22111003) and entrance gate (Reg. No. 22111004) was built in 1830 and is a detached five-bay two-storey over-basement house with four-bay rear elevation, portico to front elevation and projecting bay (Fig. 12); it is set in landscaped grounds. The iron entrance gates are bounded by piers. The house is screened from the development by trees. Further east is Alta Villa (Reg. No. 22111006) which was built in 1780–1820. A street-fronting house (Reg. No. 22111006) built in *c.* 1835 is to the south of the development; these houses are not visible from the development site.

Figure 11. 9: Proposed development site with stone chip surface (looking north-west)

Figure 11.10: Existing concrete surface along west and north side of the development area (looking east)

Figure 11.9: Proposed development site with stone chip surface (looking north-west)

Figure 11.10: Existing concrete surface along west and north side of the development area (looking east)

11.7. Impact of proposed development on the archaeological/cultural heritage landscape

This application is for permission to construct a karting track. The site has no known or previously recorded archaeological sites. The architectural heritage closest to the site is Caher Abbey house which is separated from the proposed development by a quarry access road and is also screened by a tree-belt.

The proposed development site has been altered and is now a stone chipped surface with a concrete road to the west. The topsoil and subsoil was presumably stripped from the surface before the stone chippings and concrete road surface were laid; the reduction of ground levels in the past would have removed any layers of potential archaeological interest.

The site is now a brownfield site. The impact of developing a karting track and ancillary works is minimal on the archaeological/cultural heritage landscape.

11.8. Conclusions

This application is planning for a karting track and ancillary works. The site has been altered and is now a brownfield site. A review of the archaeological potential of the site suggests that there

were no visible archaeological monuments on the site. Aerial photographic covered which detected two monuments (RMP TS 075-080 and 080-001) to the east did not record any sites on the land-bank zoned for karting track development. The development will have no impact on the archaeological landscape or potential archaeological sites. The development will not be intrusive on the visual aspect of nearby architectural structures which are listed in the architectural inventory of Ireland as buildings of regional significance.

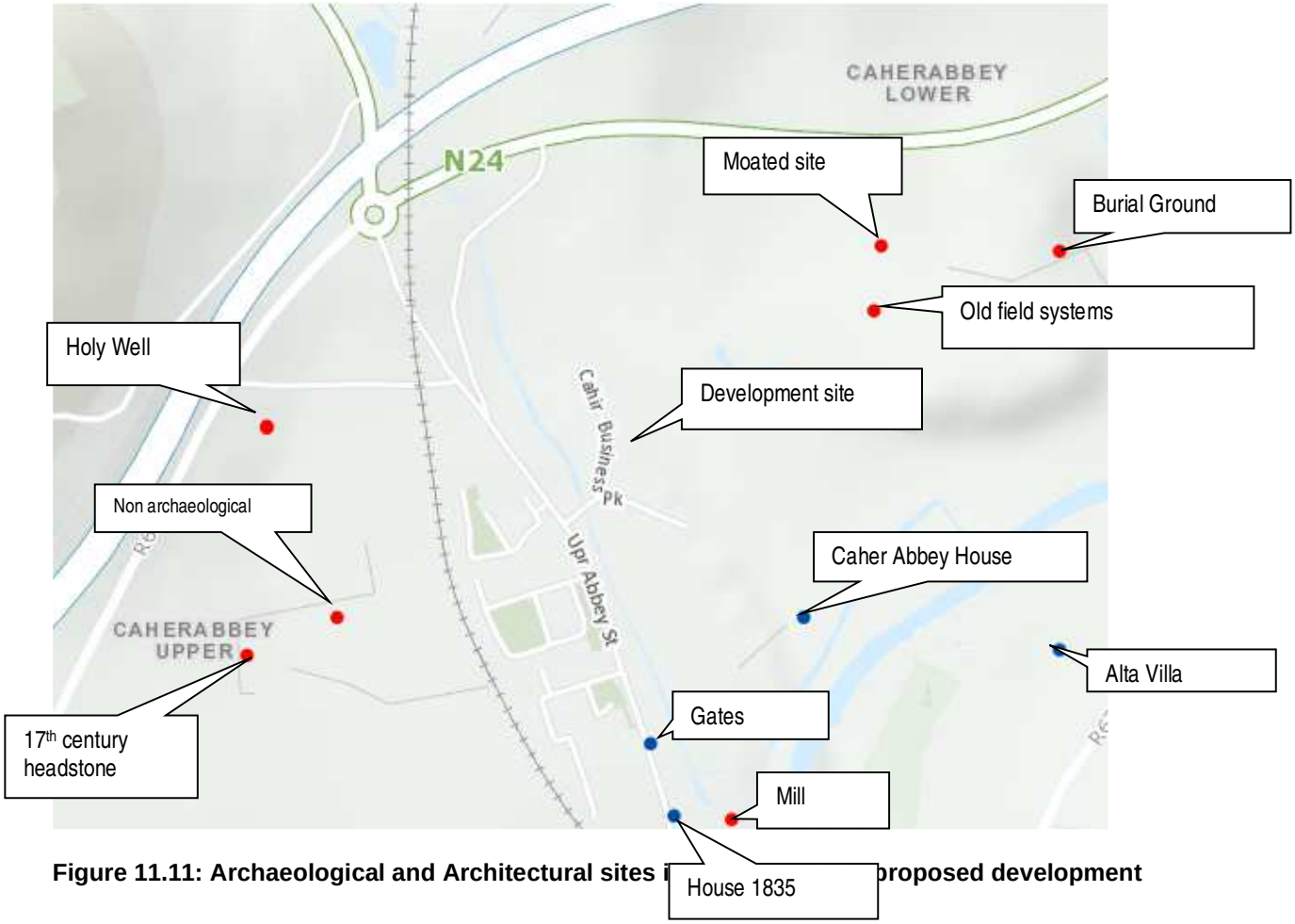


Figure 11.11: Archaeological and Architectural sites i proposed development

Figure 11.12: Caher Abbey House

References

Bence-Jones, M. 1988 *A guide to Irish country houses*. London

Burke, Rev. W.P. 1909 Cahir castle. *Journal of the Royal Society of Antiquities of Ireland* 39, 272-4.

Cahill, M. and Holland, P. Sand Pit Burials 1989 In I. Bennett (ed.) *Excavations* 1989, Dublin, Wordwell.

Gwynn, A. and Hadcock, R.N. 1970 (Reprint 1988) *Medieval religious houses of Ireland*. Dublin. Irish Academic Press.

Killanin, M.M. and Duignan, M.V. 1967 (2nd ed.) *The Shell guide to Ireland*. London. The Ebury Press.

Leask, H. G. 1973 (reprint). *Irish Castles*. Dundalk, Dundalgen Press.

Manning, C. and O'Shaughnessy, A. (eds.) 1999 *Cahir Castle Co. Tipperary*. Dublin. Dúchas The Heritage Service, Department of Arts, Heritage, Gaeltacht and the Islands.

Simington, R.C. (ed.) 1931 The Civil survey, AD 1654-1656. Vol I: county of Tipperary: eastern and southern baronies. Dublin. Irish Manuscripts Commission.

12. Traffic

12.1 INTRODUCTION

This chapter of the EIAR quantifies and assesses the impact of traffic generated by the proposed development on the existing local road network, and recommends mitigation measures, as appropriate.

12.1.1. Scope of Assessment

The scope of the traffic and transportation assessment includes consideration of the following:

- Existing and expected future road and transport network;
- Existing and predicted future baseline traffic volumes on the surrounding local road network;
- Predicted traffic volumes associated with the proposed development and likely impacts; and
- Proposed mitigation measures.

12.2 Methodology

This chapter has been prepared in the context of the following:

- Tipperary County Council's South Tipperary Development Plan 2009 (as varied);
- Tipperary County Council's Cahir Local Area Plan 2011;
- The Transport Infrastructure Ireland (TII) Traffic and Transport Assessment (TTA) Guidelines PE-PDV-02045 May 2014;
- TII's Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections PE-PAG-02017 October 2016; and
- The Environmental Protection Agency (EPA) Guidelines on The Information to be Contained in Environmental Impact Assessment Reports Draft August 2017 (EPA EIAR Guidelines).

Assessment Criteria

Existing baseline traffic volumes on the surrounding local road network have been established on the basis of on-site traffic counts by Malachy Walsh and Partners and automatic traffic counter data from TII's online database for national roads.

Urban road link capacities on the R640 Regional Road have been established on the basis of the UK Traffic Capacity of Urban Roads TA79/99.

The existing R640 Cahir Business Park access junction was analysed using the computer software programme PICADY, for priority controlled junctions.
The significance and duration of predicted impacts have been defined in accordance with the EPA EIAR Guidelines.

Statement of Limitations and Difficulties encountered

There were no limitations and difficulties encountered in the preparation of this Traffic and Transportation Chapter.

Competency of Assessor

This Traffic and Transportation Chapter has been prepared by Seamus Quigley BE CEng MIEI MCIHT of Malachy Walsh and Partners. Seamus Quigley has over 29 years' experience in transport planning and traffic engineering projects, including EIS/EIAR traffic and transportation chapters, traffic impact assessments, traffic management studies, mobility management plans, traffic modelling studies, feasibility studies and road safety audits.

Forecasting methods

PICADY (Priority Intersection CApacity and DelaY) is a computer programme for calculating estimates of the capacity of major /minor road junctions, where the minor road is controlled by a stop or yield sign. The geometric details of the junction are supplied to the programme, together with details of traffic flows and turning movements. The programme analyses the junction in relation to the various traffic flows and calculates the capacity of each approach. The programme also calculates the average queue length on each approach and the average delay per vehicle. The average queue length may be displayed in graphical form. PICADY is issued by the UK company, TRL (formerly the Transport Research Laboratory).

12.3 EXISTING ENVIRONMENT

12.3.1 Site in Context

The proposed development site is located at Cahir Business Park on the east side of Upper Abbey Street/Tipperary Road, in Cahir, County Tipperary, as shown on **Figure 0-1**. Upper Abbey Street extends north from Cahir town centre to the Tipperary Road, and both are part of the R640 Regional Road. A Local Road Network Map is provided in **Figure 12-2**.

Cahir Business Park has a single access road which forms a Stop controlled T-junction with the R640 Tipperary Road. There is a dedicated right-turn lane on the R640 Tipperary Road at the junction, with a total road carriageway width of circa 10 metres, footways and east side street lighting.

The Cahir Business Park access road has a typical road carriageway width of 7.0 metres with a south side footway locally at its R640 junction. Approximately 55 metres east of its R640 junction, the Business Park has an internal access roads Yield junction. East of this internal junction, the internal access road serving the proposed development site has a typical road carriageway width of 6.0 metres.

The R640 Cahir Business Park access road junction and Business Park access roads are located within the Cahir 50 km/hour urban speed limit zone.

Approximately 950 metres south of Cahir Business Park, the R640 extends along Abbey Street to its Stop T-junction with Mitchelstown Road, on the west side of Cahir town centre. The Abbey

Street/Mitchelstown Road junction includes dedicated left and right-turn lanes on Abbey Street and a right-turn lane on Mitchelestown Road.

Cahir is served by the N24 Cahir Bypass Road and the M8 Motorway, located on its northern side. An N24 Link Road to the M8 is located on the north east side of Cahir. The N24 Bypass Road and M8 Motorway have reduced through traffic volumes in Cahir.

Figure 0-1 Site Location and Road Network Map

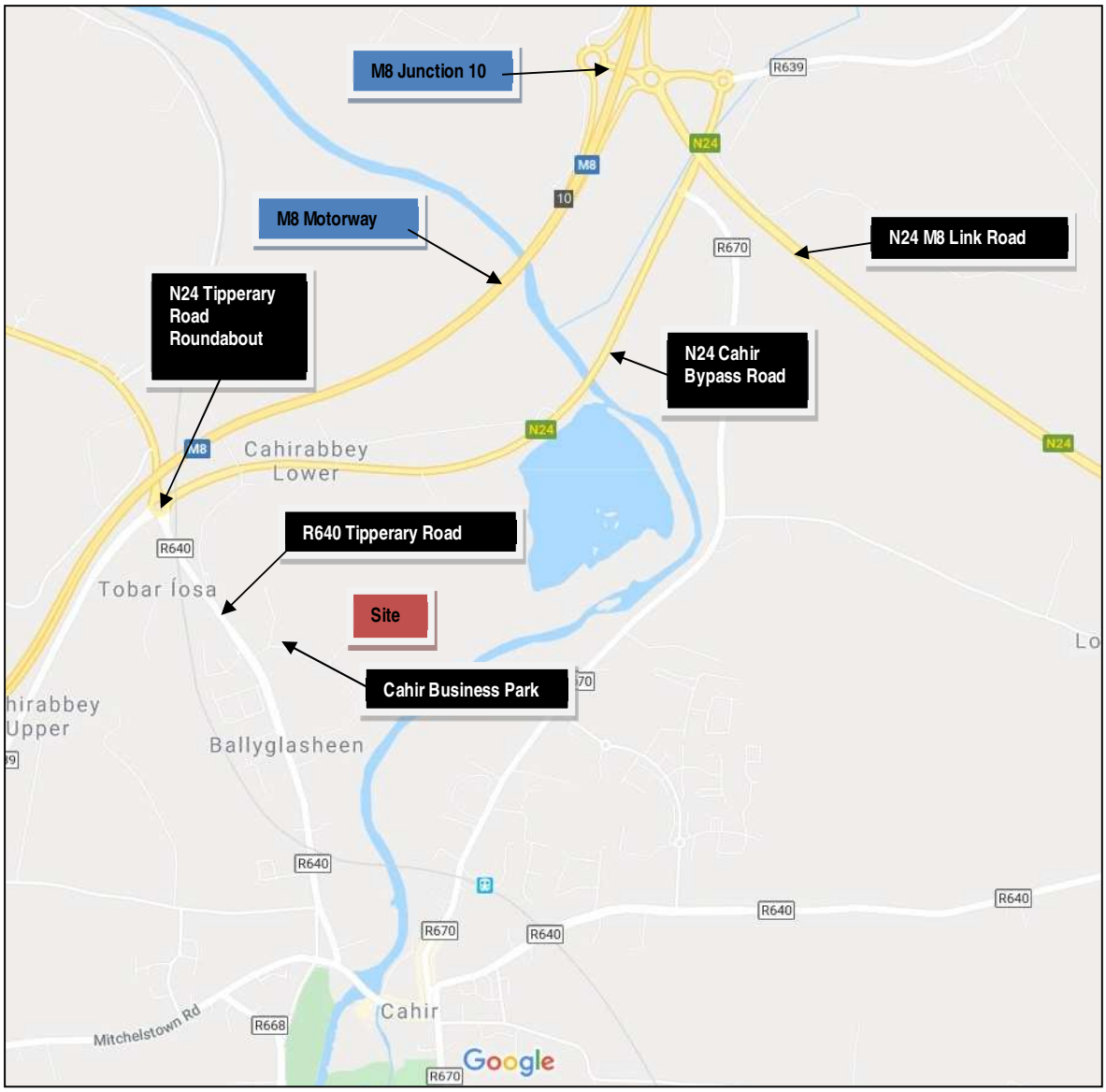
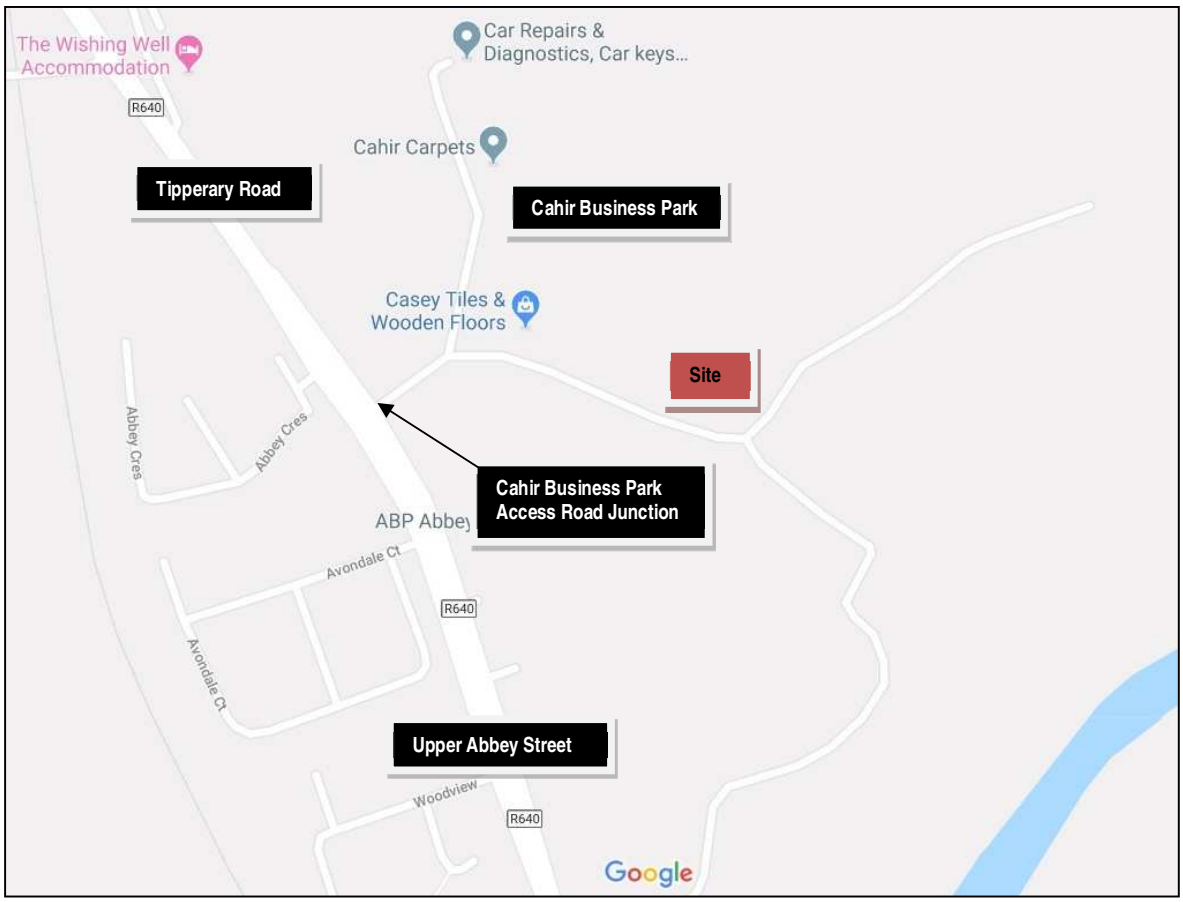


Figure 0-2 Local Road Network Map



Approximately 500 metres north of its Cahir Business Park access junction, the R640 Tipperary Road forms the Tipperary Road Roundabout junction with the N24 and R639 on the Cahir Bypass Road, within the Cahir 60 km/hour suburban speed limit zone. The N24 Cahir Bypass Road links with the M8 Motorway Junction 10 on the north east of Cahir. The R639 extends south west from N24 Tipperary Road Roundabout, to M8 Junction 11.

12.2.2. Baseline Traffic Data

The TII automatic traffic counter data for the M8 and N24, in the vicinity of Cahir, indicates that the weekday evening peak hour is the overall peak traffic hour. On-site classified junction traffic turning volumes were recorded by Malachy Walsh and Partners at the existing R640 Cahir Business Park access junction on Thursday 28th November 2019, during the evening peak traffic period. The recorded peak hour was from 4.30 p.m. to 5.30 p.m. The recorded peak hour junction turning traffic volumes at the existing R640 Tipperary Road/Cahir Business Park access road junction are detailed in **Table 0.1**.

Table 0.1 Recorded 2019 R640 Tipperary Road/Cahir Business Park Peak Hour Traffic Volumes

Junction	Approach	Movement	Peak Hour Traffic Volumes	
			Total Vehicles	Heavy Vehicles
R640 Tipperary Road/Cahir Business Park Access Road	R640 Tipperary Road Southbound	Left	19	1
		Straight	144	0
	Cahir Business Park Access Road	Left	38	2
		Right	45	5
	R640 Tipperary Road Northbound	Right	27	0
		Straight	177	4

The recorded peak hour road link traffic volumes at the existing R640 Tipperary Road/Cahir Business Park access road junction are summarised in **Table 0.1**.

Table 0.2 Recorded 2019 Peak Hour Road Link Traffic Volumes

Junction	Road Link	Total Vehicles (Heavy Vehicles)
R640 Tipperary Road/Cahir Business Park Access Road	R640 Tipperary Road North	385 (10)
	Cahir Business Park Access Road	129 (12)
	R640 Tipperary Road South	386 (6)

Automatic traffic counter data from TII's online database for the M8 and N24 national roads located in the vicinity is provided in **Table 0.3**. The 2019 evening peak hour traffic volumes are for Thursday 28th November 2019. The Annual Average Daily Traffic (AADT) volumes' data is for the latest full year, 2018, together with the percentage proportion of heavy goods vehicles (HGVs).

Table 0.3 TII National Roads Traffic Volumes

National Road	Location	Total Vehicles (HGVs)	
		2019 PM Peak Hour	2018 AADT (% HGVs)
N24	M8 Link Road	769 (45)	7,209 (11.3%)
N24	Between Bansha and Tipperary	611 (28)	5,991 (5.9%)
M8	Between M8 Junction 9 and Junction 10	1,483 (138)	15,782 (12.0%)

The urban road link capacity of the R640 within its 50 km/hour urban speed limit zone, estimated on the basis of the UK Traffic Capacity of Urban Roads TA79/99, is provided in **Table 4**. The TII suburban road link capacities are per each direction per hour, based on a 60/40 directional split.

Table 12.4 Estimated R640 Urban Road Link Capacity in Each Direction

R640 50 km/hour Urban Road	Urban Road Link			
	Type	Lanes	Carriageway Width (m)	Capacity/Hour/Direction (Vehicles)
R640 Upper Abbey Street/Tipperary Road	UAP3	2	7.0	1,110

The estimated existing urban road link peak hour volume/capacity ratios for the R640 within its 50 km/hour urban speed limit zone are provided in **Table1 2.5**, on the basis of the UK Traffic Capacity of Urban Roads TA 79/99.

Table1 2.5 Estimated Existing R640 Urban Road Link Peak Hour Volume/Capacity Ratios

R640 50 km/hour Urban Road	Peak Hour Direction	Peak Hour Vehicles	Capacity/Hour/Direction (Vehicles)	Volume/Capacity Ratio
R640 Upper Abbey Street/Tipperary Road	Southbound	182	1,110	16%
	Northbound	222		20%

The R640 Upper Abbey Street/Tipperary Road is operating well within its estimated urban road link capacity, with highest volume/capacity ratios during the peak hour of 16% and 20%, respectively.

On the basis of the TII traffic data and the recorded R640 Cahir Business Park junction traffic volumes, the estimated latest full year, 2018, AADT volumes at the R640 Cahir Business Park junction are provided in
Table 12.6, together with the percentage proportions of heavy goods vehicles (% HGVs).

Table 12.6 Estimated 2018 R640 Cahir Business Park AADT Volumes

R640 Cahir Business Park Road Link	2018 AADT Vehicles (% HGVs)
R640 Tipperary Road	3,889 (2.6%)

Cahir Business Park Access Road	1,303 (9.3%)
R640 Upper Abbey Street	3,899 (1.6%)

12.3 Likely significant impacts

12.3.1 Do Nothing Impacts

The roads and transportation objectives and policies of Tipperary County Council are set out in their South Tipperary Development Plan 2009 (as varied) and Cahir Local Area Plan 2011. Tipperay County Council are currently preparing a Draft Cahir Local Area Plan 2020-2016.

Subject to planning permission, the proposed development is scheduled to be fully complete and operational in 2020. The TII Traffic and Transport Assessment Guidelines recommend that the opening year of a development proposal and plan years, five and 15 years after the opening year, should be considered for assessing a development proposal. In this case, the opening year is 2020 and the plan years are 2025 and 2035.

TII in their Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections October 2016 envisage that car and light vehicle volumes on Ireland South-East national roads, including South Tipperary, would increase by an annual factor of 1.0118 during the period to 2030, and by a factor of 1.0242 for heavy vehicles, based on their high sensitivity growth scenario. The equivalent factors for the period 2030 to 2050 are 1.0038 and 1.0195, respectively.

The existing 2019 peak hour and 2018 AADT volumes have been factored to 2020, 2025 and 2035 levels on the basis of the foregoing TII predicted high sensitivity growth scenario; and are provided in **Table 12.7**, **Table 12.8**, **Table 12.9** and **Table 12.10**, respectively.

Table 0.7 Predicted R640/Cahir Business Park Peak Hour Traffic Volumes with TII High Growth

Junction	Approach	Movement	Year	Peak Hour Traffic Volumes	
				Total Vehicles	Heavy Vehicles
R640 Tipperary Road/Cahir Business Park Access Road	R640 Tipperary Road Southbound	Left	2020	19	1
			2025	20	1
			2035	23	2
		Straight	2020	146	0
			2025	155	0
			2035	167	0
	Cahir Business Park Access Road	Left	2020	39	2
			2025	41	2
			2035	46	4
		Right	2020	46	5
			2025	49	6
			2035	54	7
	R640 Tipperary Road Northbound	Right	2020	27	0
			2025	29	0
			2035	31	0
		Straight	2020	179	4
			2025	191	5
			2035	207	6

Table 0.8 Predicted Peak Hour Road Link Traffic Volumes with TII High Growth

Junction	Road Link	Year	Total Vehicles (Heavy Vehicles)
R640 Tipperary Road/Cahir Business Park Access Road	R640 Tipperary Road North	2020	390 (10)
		2025	415 (12)
		2035	451 (15)
	Cahir Business Park Access Road	2020	131 (8)
		2025	139 (9)
		2035	154 (13)
	R640 Tipperary Road South	2020	391 (6)
		2025	416 (7)
		2035	451 (10)

Table 0.9 Predicted TII National Roads Traffic Volumes with TII High Growth

National Road	Location	Year	Total Vehicles (HGVs)	
			PM Peak Hour	AADT (% HGVs)
N24	M8 Link Road	2020	779 (46)	7,305 (11.4%)
		2025	829 (52)	7,802 (12.1%)
		2035	905 (65)	8,585 (13.6%)
N24	Between Bansha and Tipperary	2020	590 (29)	6,067 (6.0%)
		2025	658 (32)	6,458 (6.3%)
		2035	716 (40)	7,046 (7.2%)
M8	Between M8 Junction 9 and Junction 10	2020	1,502 (141)	15,992 (12.1%)
		2025	1,602 (159)	17,088 (12.8%)
		2035	1,758 (198)	18,824 (14.4%)

Table 0.10 Predicted R640 Cahir Business Park AADT Volumes with TII High Growth

R640 Cahir Business Park Road Link	Year	AADT Vehicles (% HGVs)
R640 Tipperary Road	2020	3,936 (2.6%)
	2025	4,182 (2.8%)
	2035	4,539 (3.2%)
Cahir Business Park Access Road	2020	1,320 (9.4%)
	2025	1,408 (9.9%)
	2035	1,544 (11.2%)
R640 Upper Abbey Street	2020	3,946 (1.6%)
	2025	4,189 (1.7%)
	2035	4,540 (2.0%)

The predicted 2020, 2025 and 2035 urban road link peak hour volume/capacity ratios for the R640 within its 50 km/hour urban speed limit zone are provided in **Table1 2.5**, on the basis of the UK Traffic Capacity of Urban Roads TA 79/99, with TII's high growth traffic scenario.

Table 0.11 Predicted R640 Urban Road Link Peak Hour Volume/Capacity Ratios with TII High Growth

Year	R640 Peak Hour Direction	Peak Hour Vehicles	Capacity/Hour/ Direction (Vehicles)	Volume/Capacity Ratio
2020	Southbound	185	1,110	17%
	Northbound	225		20%
2025	Southbound	196		18%
	Northbound	240		22%

2035	Southbound	213		19%
	Northbound	261		24%

The R640 Upper Abbey Street/Tipperary Road would continue to operate well within its estimated urban road link capacity, in 2020, 2025 and 2035 with TII's high growth traffic scenario, with highest volume/capacity ratios during the peak hour of 20%, 22% and 24%, respectively. The existing R640 Cahir Business Park access junction was analysed using the computer software programme PICADY, for priority controlled junctions, for the predicted 2020, 2025 and 2035 peak hour traffic volumes with TII's high growth scenario. Full details of the analysis are provided in **Appendix 3** of this EIAR. The results are summarised in **Table 12.12**.

Table 0.12 R640 Cahir Business Park Access Junction PICADY Capacity Analysis with TII High Growth

Peak Hour Year	Highest Ratio of Flow to Capacity (RFC)	Highest Mean Maximum Queue Length (vehicles)	Highest Delay per Vehicle (minutes)
2020	0.160	0.2	0.13
2025	0.172	0.2	0.13
2035	0.196	0.2	0.14

A Ratio of Flow to Capacity (RFC) of 0.900 is considered to represent the typical practical capacity of a priority controlled junction. The above analysis indicates that the existing R640 Cahir Business Park access junction would operate well within practical capacity, without any significant traffic queuing and delays, during the predicted 2020, 2025 and 2035 peak hours with TII's high growth scenario. The junction would operate with a highest RFC of 0.196, in 2035. Highest delays per vehicle would be 0.14 minutes.

12.3.2 Construction Phase Impacts

A detailed description of the proposed construction works is provided in **Chapter 2 Description of the Proposed Development.**

Subject to planning permission, the proposed development is scheduled to be fully complete and operational in 2020. The total construction programme would be approximately six weeks. The proposed development is a relatively small development. There would be five to six construction staff on site during the construction period. There would be no construction works on Sundays or bank holidays.

Construction staff would generate up to six car and van trips to site during the morning peak traffic period and from site during the evening peak traffic period. This would increase predicted 2020 peak hour traffic volumes generated by Cahir Business Park by up to 4.6%.

On the basis of the recorded distribution of peak hour traffic volumes generated by the Business Park on the R640, construction staff traffic volumes generated by the proposed development would increase predicted 2020 peak hour traffic volumes on the R640 by 0.8%.

Construction delivery vehicle volumes would be up to two heavy vehicles per day. There would be no materials removed off-site during construction.

Traffic volumes generated during the circa six weeks construction phase would be relatively low, and would have no significant adverse traffic impact of the existing local road network.
The predicted 2020 urban road link peak hour volume/capacity ratios for the R640 within its 50 km/hour urban speed limit zone are provided in **Table1 2.5**, on the basis of the UK Traffic Capacity of Urban Roads TA 79/99, with TII's high growth traffic scenario and the proposed development construction phase traffic volumes.

Table 0.13 Predicted R640 Urban Road Link Peak Hour Volume/Capacity Ratios with Construction Phase

Year	R640 Peak Hour Direction	Peak Hour Vehicles	Capacity/Hour/ Direction (Vehicles)	Volume/Capacity Ratio
2020	Southbound	188	1,110	17%
	Northbound	228		21%

The R640 Upper Abbey Street/Tipperary Road would continue to operate well within its estimated urban road link capacity, in 2020, with TII's high growth traffic scenario and the proposed development construction phase traffic volumes, with highest volume/capacity ratios during the peak hour of 17% and 21%, respectively. These compare to ratios of 17% and 20% without the proposed development.

The existing R640 Cahir Business Park access junction was analysed using the computer software programme PICADY, for priority controlled junctions, for the predicted 2020 peak hour traffic volumes with TII's high growth scenario and with the proposed construction phase traffic volumes. Full details of the analysis are provided in **Appendix 3.** The results are summarised in **Table 12.14**.

Table 0.14 R640 Cahir Business Park Access Junction PICADY Capacity Analysis with Construction Phase

Peak Hour Year	Highest Ratio of Flow to Capacity (RFC)	Highest Mean Maximum Queue Length (vehicles)	Highest Delay per Vehicle (minutes)
2020	0.171	0.2	0.13

A Ratio of Flow to Capacity (RFC) of 0.900 is considered to represent the typical practical capacity of a priority controlled junction. The above analysis indicates that the existing R640 Cahir Business Park access junction would continue to operate well within practical capacity, without any significant traffic queuing and delays, during the predicted 2020 peak hour with TII's high growth scenario and with the proposed construction phase traffic volumes. The junction would operate with a highest RFC of 0.172, compared to 0.160 without the proposed development. Highest delays per vehicle would be 0.13 minutes, which would be unchanged compared to without the proposed development. On the basis of the EPA Guidelines, the proposed construction phase would have imperceptible to not significant temporary traffic effects.

12.3.3 Operational Phase Impacts

A detailed description of the proposed operational phase is provided in **Chapter 2 Description of the Proposed Development.**

The proposed development would employ five to 10 staff, with up to three staff in attendance at any one time.

The proposed karting track would have a maximum track capacity for 15 karts. Accordingly, in order to consider a robust basis for a highest peak hour traffic generation scenario by the proposed development, it is assumed that up to 15 persons would arrive during the peak hour and 15 persons would depart during the peak hour, with all persons assumed to travel as car drivers.The predicted highest additional peak hour traffic turning volumes at the existing R640 Cahir Business Park access road junction, with the proposed development highest peak hour traffic generation scenario, are provided in **Table 12.15**.

Table 0.15 Predicted Highest Additional Peak Hour Traffic Volumes with Proposed Development

Junction	Approach	Movement	Additional Peak Hour Traffic Volumes
R640 Tipperary Road/Cahir Business Park Access Road	R640 Tipperary Road Southbound	Left	+6
		Straight	+0
	Cahir Business Park Access Road	Left	+7
		Right	+8
	R640 Tipperary Road Northbound	Right	+9
		Straight	+0

The predicted 2020, 2025 and 2035 peak hour road link traffic volumes at the R640 Cahir Business Park access road junction, with the proposed development highest peak hour traffic generation scenario, are provided in **Table 12.16**.

Table 0.16 Predicted Peak Hour Road Link Traffic Volumes with Proposed Development

Junction	Road Link	Year	Total Vehicles	Change
R640 Tipperary Road/Cahir Business Park Access Road	R640 Tipperary Road North	2020	404 (10)	+14
		2025	429 (12)	
		2035	465 (15)	
	Cahir Business Park Access Road	2020	161 (8)	+30
		2025	169 (9)	
		2035	184 (13)	
	R640 Tipperary Road South	2020	407 (6)	+16
		2025	432 (7)	
		2035	467 (10)	

The proposed development highest peak hour traffic generation scenario would increase peak hour traffic volumes generated by Cahir Business Park by up to 30 vehicles. The highest peak hour increase on the R640 would be 16 vehicles and 4.1%.

The proposed development would increase peak hour traffic volumes on the N24 by up 0.9%, and on the M8 by up to 0.5%.

The proposed development would generate up to 85 daily users and staff. Total daily vehicles generated by the proposed development would be up to 73 vehicles inbound and 73 vehicles outbound, on the basis of a vehicle occupancy of 1.2 persons/vehicle and up to two

service/delivery vehicles. This includes all vehicles, including vehicles generated by the proposed driving school sessions, which would have up five attendees at each session.

In order to consider a robust basis for a highest daily traffic generation scenario by the proposed development, it is assumed that the predicted highest daily users would occur on each day and equate to AADT volumes. The predicted 2020, 2025 and 2035 AADT volumes at the R640 Cahir Business Park access road junction, with the proposed development generated daily traffic volumes, are provided in **Table 12.17**.

Table 0.17 Predicted R640 Cahir Business Park AADT Volumes with Proposed Development

R640 Cahir Business Park Road Link	Year	AADT Vehicles	Change
R640 Tipperary Road	2020	4,004	+68
	2025	4,250	
	2035	4,607	
Cahir Business Park Access Road	2020	1,466	+146
	2025	1,554	
	2035	1,690	
R640 Upper Abbey Street	2020	4,024	+78
	2025	4,267	
	2035	4,618	

The proposed development would increase AADT volumes generated by Cahir Business Park by up to 146 vehicles. The highest AADT increase on the R640 would be up to 78 vehicles and 2.0%.
The proposed development would increase AADT volumes on the N24 by up to 0.5%, and on the M8 by up to 0.2%.

The predicted highest increases in peak traffic hour and daily traffic volumes generated by the proposed development on the R640, N24 and M8 would be less than the volumetric threshold increases (5%) identified by TII in their TTA Assessment Guidelines for consideration of sensitive locations.

The predicted 2020, 2025 and 2035 urban road link peak hour volume/capacity ratios for the R640 within its 50 km/hour urban speed limit zone are provided in **Table1 2.5**, on the basis of the UK Traffic Capacity of Urban Roads TA 79/99, with TII's high growth traffic scenario and the proposed development operational phase.

Table 0.18 Predicted R640 Urban Road Link Peak Hour Volume/Capacity Ratios with Proposed Development

Year	R640 Peak Hour Direction	Peak Hour Vehicles	Capacity/Hour/ Direction (Vehicles)	Volume/Capacity Ratio
2020	Southbound	192	1,110	17%
	Northbound	233		21%
2025	Southbound	203		18%

	Northbound	248		22%
2035	Southbound	220		20%
	Northbound	269		24%

The R640 Upper Abbey Street/Tipperary Road would continue to operate well within its estimated urban road link capacity, in 2020, 2025 and 2035 with TII's high growth traffic scenario and the proposed development operational phase, with highest volume/capacity ratios during the peak hour of 21%, 22% and 24%, respectively. These compare to highest ratios of 20%, 22% and 24%, respectively, without the proposed development.

The existing R640 Cahir Business Park access junction was analysed using the computer software programme PICADY, for priority controlled junctions, for the predicted 2020, 2035 and 2035 peak hour traffic volumes with TII's high growth scenario and the proposed development operational phase. Full details of the analysis are provided in **Appendix 3.** The results are summarised in **Table 12.19**.

Table 0.19 R640 Cahir Business Park Access Junction PICADY Capacity Analysis with Proposed Development Operational Phase

Peak Hour Year	Highest Ratio of Flow to Capacity (RFC)	Highest Mean Maximum Queue Length (vehicles)	Highest Delay per Vehicle (minutes)
2020	0.189	0.2	0.13
2025	0.202	0.3	0.13
2035	0.226	0.3	0.14

A Ratio of Flow to Capacity (RFC) of 0.900 is considered to represent the typical practical capacity of a priority controlled junction. The above analysis indicates that the existing R640 Cahir Business Park access junction would to operate well within practical capacity, without any significant traffic queuing and delays, during the predicted 2020, 2025 and 2035 peak hours with TII's high growth scenario and the proposed development operational phase. The junction would operate with a highest RFC of 0.226, in 2035, compared to 0.196 without the proposed development. Highest delays per vehicle would be 0.14 minutes, which would be unchanged compared to without the proposed development.
On the basis of the EPA Guidelines, the proposed development would have slight to moderate operational traffic effects.

12.3.4 Cumulative Effects

The predicted 2020, 2025 and 2035 baseline traffic volumes are on the basis of TII's predicted high sensitivity growth scenario. This high sensitivity growth scenario includes for other proposed development generated traffic volumes on the surrounding local road network.

12.4 Mitigation

12.4.1 Construction Phase

The construction phase would not result in any significant adverse traffic impacts, and no significant mitigation measures would be required.

Operational Phase

The proposed development would not have a significant operational traffic impact, and no significant mitigation measures would be required.

12.5 Residual Impacts

12.5.1 Construction Phase

On the basis of the EPA Guidelines, the proposed construction phase would have imperceptible to not significant temporary traffic effects.

12.5.2 Operational Phase

On the basis of the EPA Guidelines, the proposed development would have slight to moderate operational traffic effects.

12.6 Conclusion

The proposed development would not have a significant adverse traffic impact on the surrounding road network.

12.7 References

Tipperary County Council South Tipperary Development Plan 2009 (as varied)
Tipperary County Council Cahir Local Area Plan 2011
Transport Infrastructure Ireland (TII) Traffic and Transport Assessment (TTA) Guidelines PE-PDV-02045 May 2014
TII's Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections PE-PAG-02017 October 2016
Environmental Protection Agency (EPA) Guidelines on The Information to be Contained in Environmental Impact Assessment Reports Draft August 2017 (EPA EIAR Guidelines)

13. Interactions

13.1 Introduction

The European Union (Environmental impact assessment) (Integrated pollution prevention and control) Regulations (2012) note that an environmental impact assessment should include an evaluation of interactive effects between the various topics assessed in an EIS. This chapter briefly discusses such effects.

13.2 Potential interactions

Potential interactions are identified in Table 16.1. Mitigation measures where required are set out in the various topic chapters.

Table 13.1: Potential topic interactions. Interactions are reviewed below.

	Noise & vibration	Land & soils	Material assets	Air quality & climate	Population & human health	Ecology	Landscape & visual impact	Water quality	Cultural heritage	Traffic
Noise & vibration										
Land & soils	1									
Material assets	2	10								
Air quality & climate	3	11	18							
Population & human health	4	12	19	25						
Ecology	5	13	20	26	31					
Landscape & visual impact	6	14	21	27	32	36				
Water quality	7	15	22	28	33	37	40			
Cultural heritage	8	16	23	29	34	38	41	43		
Traffic	9	17	24	30	35	39	42	44	45	

1: No interactions identified.

2: Assets in proximity to project: houses. Impacts short term during construction works.

3: No interactions identified.

4: Noise assessment indicates no impacts on human health.

5: Short term noise disturbance during construction works. However, no rare species identified close to pipeline route, and construction works will be short term.

6: No interactions identified.

7: No interactions identified.

8: Noise and vibration emissions will not impact on any features of cultural importance.

9: Construction related traffic likely to increase noise levels locally over short term. No long term impacts expected.

10: No interactions identified.

11: No interactions identified.

12: No interactions identified.

13: No interactions, subject to mitigation.

15: No interactions, subject to mitigation.

16: No interactions identified.

17: No interactions identified.

18: Possible short term increases in dust during construction wont affect material assets.

19: No interactions identified.

20: No interactions identified.

21: No interactions identified.

22: River Suir SAC may be considered asset in this regard. Screening assessment indicates no adverse impacts.

23: No interactions identified.

24: No interactions identified.

25: No interactions expected, subject to implementation of dust control measures.

26: No interactions identified, subject to implementation of dust control measures.

27: No interactions identified.

28: No interactions identified.

29: No interactions identified, subject to implementation of dust control measures.

30: No interactions identified.

31: No interactions identified.

32: No interactions identified.

33: No interactions identified.

34: No interactions identified, no significant increase in traffic.

35: No interactions identified.

36: No interactions identified.

37: No interactions identified. Minimal habitat removal.

38: No interactions identified.

39: No interactions identified. Construction traffic impacts on fauna likely to be minimal.

40: No interactions identified.

41: No interactions identified. No significant visual impact.

42: No interactions identified.

43: No interactions identified.

44: No interactions identified.

45: No interactions identified.

Appendix 1 AA Screening Report

Appropriate Assessment Screening Report on behalf of Buttimer Engineering.

Proposed karting track at Cahir Abbey Industrial Estate, Cahir, Co. Tipperary.

December 2019

Prepared by

DixonBrosnan

dixonbrosnan.com

DixonBrosnan

environmental consultants

Project	**Appropriate Assessment Screening for a proposed karting track at Cahir Abbey Industrial Estate, Cahir, Co. Tipperary.**		
Client	**Howick O'Brien Consulting Engineers**		
Project ref	**Report no**	**Client ref**	
19112.1	19112.1	-	

DixonBrosnan 12 Steam Packet House, Passage West, Co. Cork. Tel 086 851 1437| carl@dixonbrosnan.com | www.dixonbrosnan.com

Date	Rev	Status	Prepared by	
07/01/20			Carl Dixon MSc.	
			Sorcha Sheehy PhD	
			Ian McDermott MSc.	

v180907

1. Introduction

1.1 Background

The information in this report has been compiled by DixonBrosnan Environmental Consultants, on the instruction of Howick O'Brien Consulting Engineers, on behalf of their client Buttimer Engineering. It provides information on and assesses the potential for the proposed development at Cahir Abbey Industrial Estate, Cahir, Co. Tipperary, to impact on any Natura 2000 sites within its zone of influence. The information in this report forms part of and should be read in conjunction with the planning application documentation being submitted to in connection with the proposed development.

The Birds Directive (2009/147/EC) and the Habitats Directive (92/42/EEC) put an obligation on EU Member States to establish the Natura 2000 network of sites of highest biodiversity importance for rare and threatened habitats and species across the EU. In Ireland, the Natura 2000 network of European sites comprises Special Areas of Conservation (SACs, including candidate SACs) and Special Protection Areas (SPAs, including proposed SPAs). 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 and from these the conservation objectives of the site are derived. The Birds and Habitats Directives set out various procedures and obligations in relation to nature conservation management in Member States in general, and of the Natura 2000 sites and their habitats and species in particular. A key protection mechanism is the requirement to consider the possible nature conservation implications of any plan or project on the Natura 2000 site network before any decision is made to allow that plan or project to proceed. Not only is every new plan or project captured by this requirement but each plan or project, when being considered for approval at any stage, must take into consideration the possible effects it may have in combination with other plans and projects when going through the process known as Appropriate Assessment (AA).

The obligation to undertake Appropriate Assessment (AA) derives from Article 6(3) and 6(4) of the Habitats Directive, and both involve a number of steps and tests that need to be applied in sequential order. Article 6(3) is concerned with the strict protection of sites, while Article 6(4) is the procedure for allowing derogation from this strict protection in certain restricted circumstances. As set out in Section 177U of the Planning and Development Act 2000 as amended, a screening for appropriate assessment of an application for consent for the proposed development must be carried out by the competent authority to assess, in view of best scientific knowledge, if the proposed development, individually or in combination with another plan or project is likely to have a significant effect on any European site. Each step in the assessment process precedes and provides a basis for other steps. The results at each step must be documented and recorded carefully so there is full traceability and transparency of the decisions made.

1.2 Aim of this report

EU and national guidance exist in relation to Member States' fulfilling their requirements under the EU Habitats Directive, with particular reference to Article 6(3) and 6(4) of that Directive. The methodology followed in relation to this AA has had regard to the following guidance:

- Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Department of Environment, Heritage and Local Government (DoEHLG, 2010);

- Department of Environment Heritage and Local Government Circular NPWS 1/10 and PSSP 2/10 on Appropriate Assessment under Article 6 of the Habitats Directive – Guidance for Planning Authorities (DEHLG, 2010b);

- Communication from the Commission on the Precautionary Principle (EC, 2000), Office for Official Publications of the European Communities, Luxembourg (EC, 2000a);
- Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC. Office for Official Publications of the European Communities, Brussels (EC, 2001);
- Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (Draft) Office for Official Publications of the European Communities, Luxembourg (EC, 2018);
- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission; (EC, 2007);
- Interpretation Manual of European Union Habitats. Version EUR 28. European Commission (EC, 2013);
- Nature and biodiversity cases: Ruling of the European Court of Justice (EC, 2006);
- The Planning and Development Act 2000-2019;
- CJEU Case C 164/17 Edel Grace Peter Sweetman v An Bord Pleanála; and
- Article 6 of the Habitats Directive: Rulings of the European Court of Justice (EC, 2014).

There have been significant changes to AA practice since both the EC (2001) and the DoEHLG guidance (2010), arising from practice and rulings in European, UK and Irish courts. The following issues have been addressed in the preparation of this report:

- When considering whether a European site can be screened out, the competent authority cannot take into account any measures intended to avoid or reduce the harmful effects of the proposed development (i.e. mitigation measures); however, a 2019 Irish High Court consideration concluded that Sustainable Drainage Systems (SuDS) are "as a matter of fact and law… not mitigation measures which a competent authority is precluded from considering at the stage 1 screening stage";
- The screening must consider the cumulative impacts of any development: that already exists; for which a planning application has been made; which the applicant for permission intends to make an application in the future; and, which is a matter of public record and which is planned to be implemented in the future;
- Consideration of the cumulative effects of plans, including local area plans;
- Where an element of the proposed development is missing design detail or subsequent agreements, the assessment should assume the worst-case scenario (i.e. the design with the greatest environmental impact); and
- Making of findings explicit.

1.2 Authors of Report

This report was prepared by Carl Dixon MSc. (Ecological Monitoring), Sorcha Sheehy PhD (Ecology/Ornithology) and Ian McDermott MSc. (Ecological Monitoring).

Carl Dixon MSc (Ecology) is a senior ecologist who has over 20 years' experience in ecological and water quality assessments with particular expertise in freshwater ecology. He also has experience in mammal surveys, invasive species surveys and ecological supervision of large-scale projects. Projects in recent years include the Waste to Energy Facility Ringaskiddy, Shannon LNG Project, supervision of the Fermoy Flood Relief Scheme, Skibbereen Flood Relief Scheme, Upgrade of Mallow WWTP Scheme, Douglas Flood Relief Scheme, Great Island Gas Pipeline etc. He has carried out ecological surveys and prepared AA/NIS reports for a range of projects.

Sorcha Sheehy PhD (ecology/ornithology) is an experienced ecological consultant with over ten years' experience. She has worked on Screening/NIS's for a range of small and large-scale projects with particular expertise in assessing impacts on birds. Recent projects include bird risk assessments for Dublin and Cork Airports, Waste to Energy Facility Rinaskiddy and Water Storage Schemes for Irish Water.

Ian McDermott MSc (Ecology) is an experienced ecologist with expertise in surveying for invasive species, mammal and bird surveys. He carries out ongoing water quality surveys for a range of projects including quarries, WWTPs etc. Likewise, he has carried out ecological surveys and prepared AA/NIS reports for a range of projects including industrial developments, pipelines, quarries and agricultural units.

2. Regulatory Context and the Appropriate Assessment Procedure

2.1 Regulatory context

The Habitats Directive (Council Directive 92/43/EEC on the *Conservation of Natural Habitats and of Wild Fauna and Flora*) aims to maintain or restore the favourable conservation status of habitats and species of community interest across Europe. The requirements of these directives are transposed into Irish law through the European Communities (Birds and Natural Habitats Regulations; S.I. No. 477 of 2011).

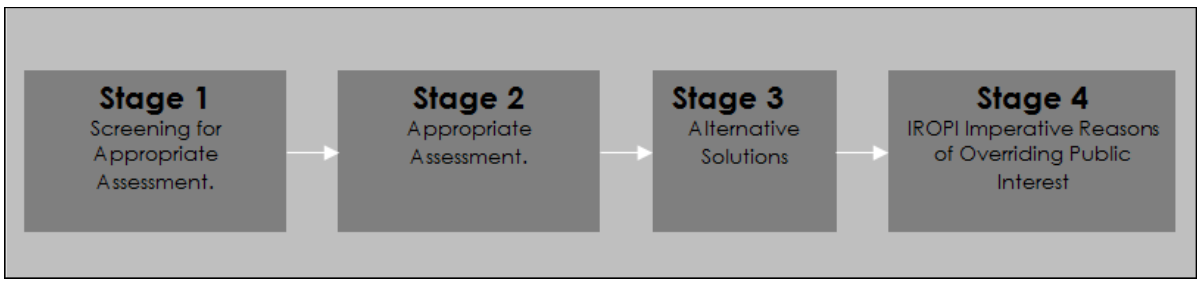
Under the Directive a network of sites of nature conservation importance have been identified by each Member State as containing specified habitats or species requiring to be maintained or returned to favourable conservation status. In Ireland the network consists of SACs and SPAs, and also candidate sites, which form the Natura 2000 network.

Article 6(3) of Council Directive 92/43/EEC of 21 May 1992 on the *Conservation of Natural Habitats and of Wild Fauna and Flora* (as amended) (hereafter 'the Habitats Directive') requires that, any plan or project not directly connected with or necessary to the management of a designated site, but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. A competent authority (e.g. the OPW or Local Authority) can only agree to a plan or project after having determined that it will not adversely affect the integrity of the site concerned.

The possibility of a significant effect on a designated or "European" site has generated the need for an appropriate assessment to be carried out by the competent authority for the purposes of Article 6(3). A Stage Two Appropriate Assessment is required if it cannot be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site. The first (Screening) Stage for appropriate assessment operates merely to determine whether a (Stage Two) Appropriate Assessment must be undertaken on the implications of the plan or project for the conservation objectives of relevant European sites.

2.2 Appropriate Assessment Procedure

The assessment requirements of Article 6(3) establish a stage-by-stage approach. This assessment follows the stages outlined in the 2001 European Commission publications "Assessment of plans and projects significantly affecting Natura 2000 sites: methodological guidance on the provisions of Articles 6(3) and 6(4) of the Habitats Directive 92/43/EEC" (2001) and Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (Draft) Office for Official Publications of the European Communities, Luxembourg (EC, 2015);



The stages are as follows:

Stage One: Screening — the process which identifies any appreciable impacts upon a Natura 2000 site of a project or plan, either alone or in combination with other projects or plans, and considers whether these impacts are likely to be significant;

Stage Two: Appropriate assessment — the consideration of the impact on the integrity of the Natura 2000 site of the project or plan, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts;

Stage Three: Assessment of alternative solutions: The process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site. It is confirmed that no reliance is placed by the developer on Stage Three in the context of this application for development consent;

Stage Four: Assessment where no alternative solutions exist and where adverse impacts remain — an assessment of compensatory measures where, in the light of an assessment of imperative reasons of overriding public interest (IROPI), it is deemed that the project or plan should proceed (it is important to note that this guidance does not deal with the assessment of imperative reasons of overriding public interest). Again, for the avoidance of doubt, it is confirmed that no reliance is placed by the developer on Stage Four in the context of this application for development consent.

It is the responsibility of the competent authority, in this instance An Bord Pleanála, to make a decision on whether or not this proposed development should be approved, taking into consideration any potential impact upon any Natura 2000 site within its zone of influence.

3. Description of Development

3.1 Site location

The proposed development site is located on the edge of Cahir town, just over 1km NNW of the town centre within the Cahir Abbey Industrial Estate (**Figure 1**). Cahir Abbey Industrial Estate lies on the northern fringes of Cahir town, on the eastern side of regional route R640, approximately 1km north of the town centre. The R640 meets the R639 300m north of the industrial estate. The R639 runs parallel to the M8 motorway.

The closest watercourse comprises of a small stream, located 200m west of the proposed development site. This stream flows in southernly direction to meet the River Suir, approximately 550m south of the proposed development site.

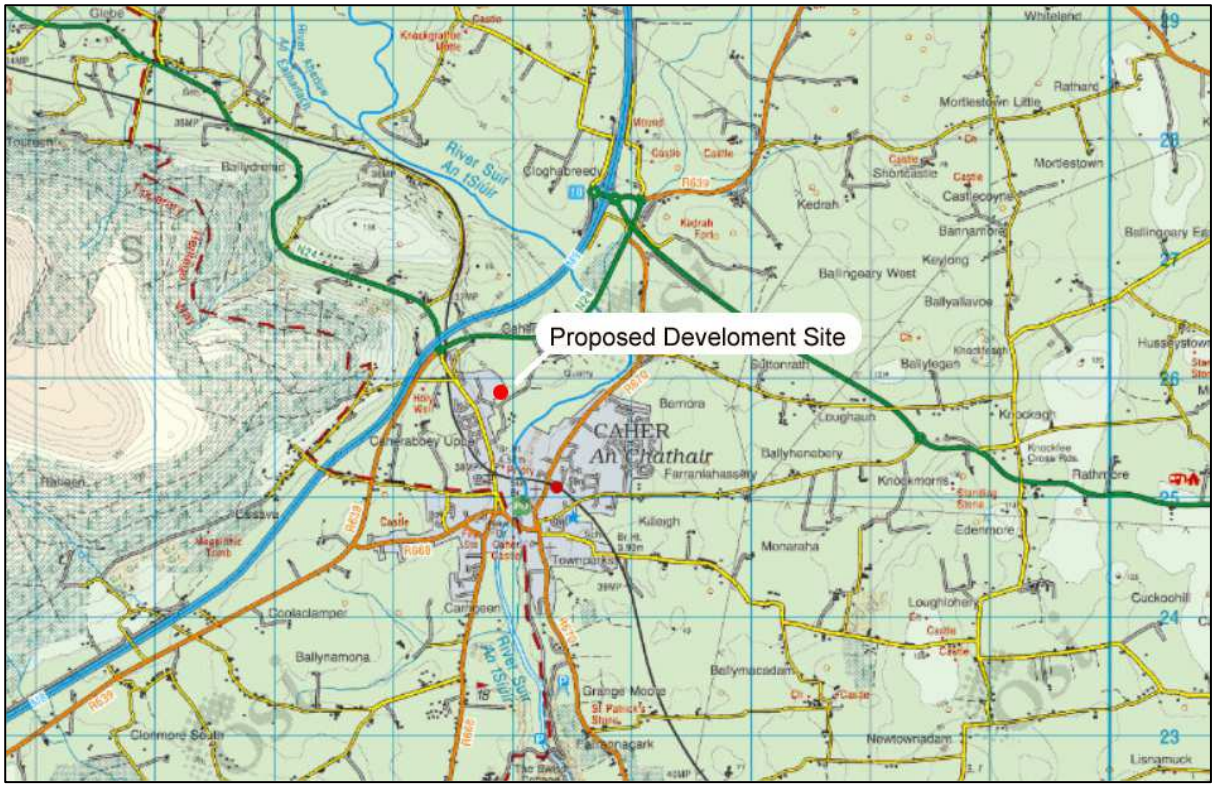


Figure 1. Location of Proposed Development Site

3.2 Overview of works

Permission has been sought for a karting track development at Cahir Abbey Industrial Estate, Cahir, Co. Tipperary. The proposed development will comprise the following;

1) a building comprising changing rooms and a W.C.
2) a building for the storing of and general maintenance of the karts
3) the installation of an over ground gas storage tank for the refuelling of the karts
4) perimeter fencing
5) general signage on the building described in item 1 above
6) general signage on the perimeter fencing
7) the change of use of the land from industrial to a karting track
8) hardstanding of the proposed areas for karting track
9) general lighting
10) and all other site development works

A drawing of the proposed site layout is shown in **Figure 2**.

As part of the proposed development a surface water drainage scheme has been designed in accordance with SuDs principles. All surface water generated from the proposed kart track development will be discharged to ground via an Aco Channel and Bypass Seperator.

It is proposed to install an Aco Channel (i.e. a high-attenuation slot drain) around the perimeter of the hardstanding. The hardstanding includes tarmac areas, concrete areas, and the roofs of the proposed buildings. The hardstanding will slope from its centre to the Aco drain at a slope of 1 in 40. In order to achieve this the centre of the track will be 900mm higher than the perimeter. The centre of the hardstanding will be at a level of 50.150 and the Aco Drain will be at a constant level of 49.250.

The Aco channel will be 150mm wide and 150mm deep and will have outlets to the main 225mm Ø Wavin uPVC sewer laid adjacent to the Aco drain at 10m C/C. The channel itself will be laid level. It is the 225mm Ø sewer that will be laid to a fall of 1 in 200. This system will drain a total of 6150m² of hardstanding area.

The 225mm surface water sewer will discharge to a Carlow Concrete CP20BP (Class 1 & 2 to EN858) Bypass Separator. The Bypass Separator is capable of draining 11,500m² of hardstanding, will store up to 1360 litres of oil and will allow a storm flow of 200 litres per second – all of which is far in excess of what this situation requires. It must be noted that this separator is designed and selected in accordance with EN858.

From the Bypass Separator the surface water discharges to a Wavin Aquacell Core system measuring 25m long x 8m wide x 1.0m deep. The AquaCell unit is wrapped in a geotextile fabric that allows water to infiltrate and does not allow silt to get in. The system has been designed in accordance with both BRE Digest 365 & manual of good practice (R156) as published by CIRIA (construction industry research and information association).

Foul effluent from the proposed development will be transferred to the existing local authority sewage line on the N24. This will be pumped using an existing 5000l foul pumping station located at the southwest corner of the proposed development site. Effluent from the proposed development will be connected to the existing sewer network and conveyed to Cahir WWTP for treatment prior to discharging to the River Suir.

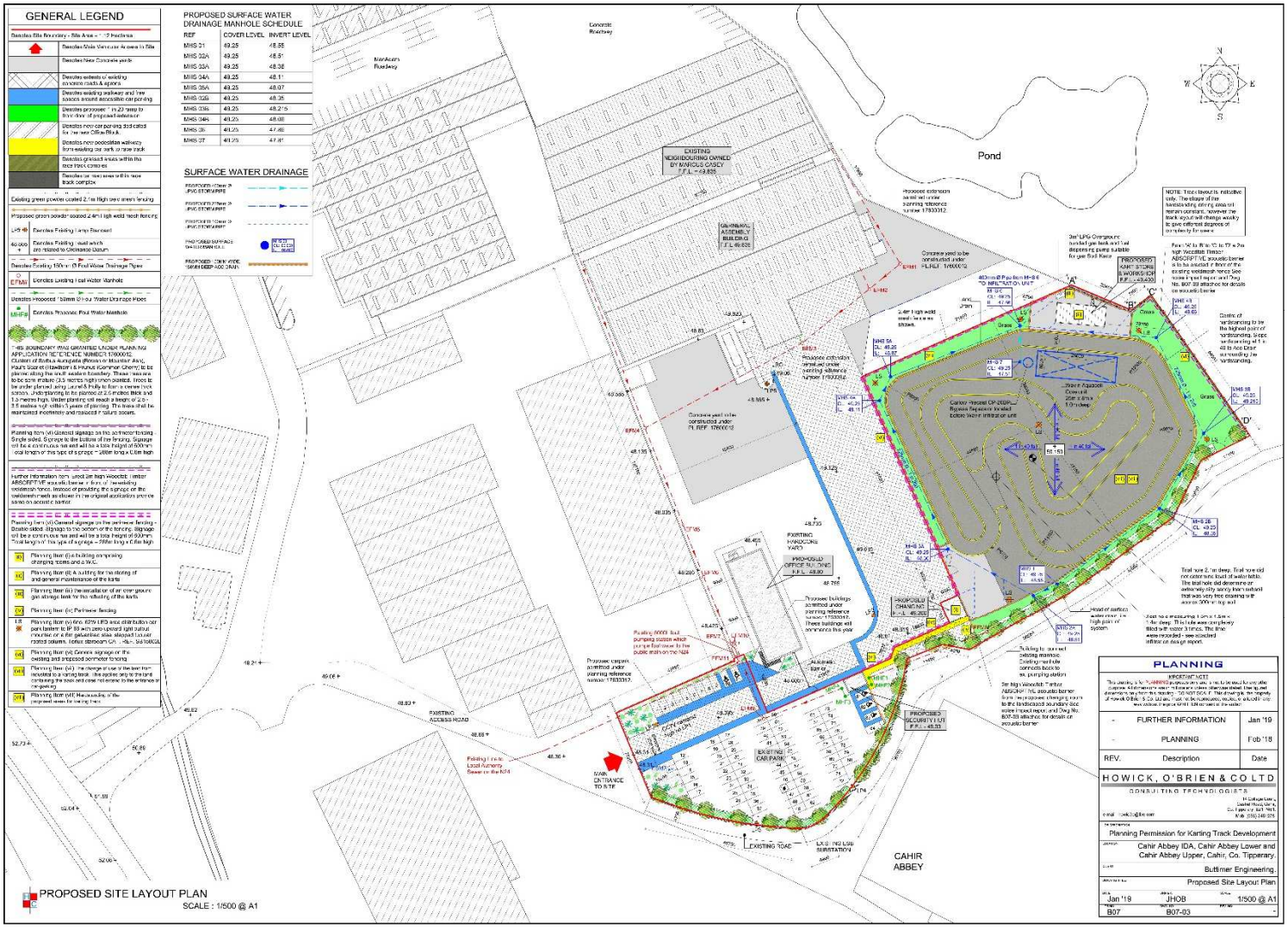


Figure 2. Proposed site layout

4. Screening

In accordance with the Department of Environment Heritage and Local Government (DoEHLG) Guidelines screening is the process that addresses two tests of Article 6(3) of the Habitats Directive:

I. *whether a plan or project is directly connected to or necessary for the management of the site, and*
II. *whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on a Natura 2000 site in view of its conservation objectives*.

If the effects are deemed to be significant, potentially significant, or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2.

4.1 Desktop Study

A desktop review facilitates the identification of the baseline ecological conditions and key ecological issues relating to Natura 2000 sites and facilitates an evaluation assessment of potential in-combination impacts. Sources of information used for this report include reports prepared for the Cahir area and information from statutory and non-statutory bodies. The following sources of information and relevant documentation were utilised:

- National Parks & Wildlife Service (NPWS) - www.npws.ie including qualifying interests and conservation objectives for Natura 2000 sites.
- Information on the status of EU protected habitats in Ireland (National Parks & Wildlife Service, 2013a & 2013b)
- Environmental Protection Agency (EPA) – www.epa.ie
- National Biodiversity Data Centre – www.biodiversityireland.ie
- BirdWatch Ireland - http://www.birdwatchireland.ie/
- Ordnance Survey of Ireland – Mapping and Aerial photography www.osi.ie.
- Water Framework Directive website – www.catchments.ie; and
- South Tipperary Biodiversity Action Plan 2010-2015

4.2 Study Area and Scope of Appraisal

Natura 2000 sites (European sites) are only at risk from significant effects where a source-pathway-receptor link exists between a proposed development and a Natura 2000 site(s). This can take the form of a direct impact (e.g. where the proposed development and/or associated construction works are located within the boundary of the Natura 2000 site(s) or an indirect impact where impacts outside of the Natura 2000 site(s) affect ecological receptors within (e.g. impacts to water quality which can affect riparian habitats at a distance from the impact source).

Considering the Natura 2000 sites present in the region, their Qualifying Interests (QIs) and conservation objectives, and any potential impact pathways that could link those sites to the proposed development area, a distance of 15km was considered appropriate to encompass all Natura 2000 sites potentially within the Zone of Influence (ZoI) of the proposed development.

Thus, any appreciable direct, indirect or cumulative impacts which could arise from the proposed development in relation to the designated sites within this zone were considered.

4.3 Field Study

A site inspection was carried out on the 9th of October 2019 to identify the habitats, flora and fauna present at the site. The surveys assessed the potential for all Qualifying Interests (QIs)/ Special

Conservation Interests (SCIs) of European sites and third schedule invasive species to occur within the proposed site.

4.4 Source-Pathway-Receptor Model

The likely effects of the proposed development on any European site has been assessed using a source-pathway-receptor model, where:

- A 'source' is defined as the individual element of the proposed works that has the potential to impact on a European site, its qualifying features and its conservation objectives.
- A 'pathway' is defined as the means or route by which a source can affect the ecological receptor.
- A 'receptor' is defined as the SCI of SPAs or QI of SACs for which conservation objectives have been set for the European sites being screened.

A source-pathway-receptor model is a standard tool used in environmental assessment. In order for an effect to be likely, all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism results in no likelihood for the effect to occur. The source-pathway-receptor model was used to identify a list of European sites, and their QIs/SCIs, with potentially links to European site. These are termed as 'relevant' European sites/QIs/SCIs throughout this report.

4.4 Likely Significant Effect

The threshold for a Likely Significant Effect (LSE) is treated in the screening exercise as being above a de minimis level. The opinion of the Advocate General in CJEU case C-258/11 outlines:

"the requirement that the effect in question be 'significant' exists in order to lay down a de minimis threshold. Plans or projects that have no appreciable effect on a European site are thereby excluded.

If all plans or projects capable of having any effect whatsoever on the site were to be caught by Article 6(3), activities on or near the site would risk being impossible by reason of legislative overkill."

In this report, therefore, 'relevant' European sites are those within the potential ZoI of activities associated with the construction and operation of the proposed development, where LSE pathways to European sites were identified through the source-pathway-receptor model.

4.5 Screening Process

The Screening for Appropriate Assessment will incorporate the following steps:

Definition of the zone of influence for the proposed works;

- Identification of the European sites that are situated (in their entirety or partially or downstream) within the zone of influence of the proposed works;
- Identification of the most up-to-date QIs and SCIs for each European site within the zone of influence;
- Identification of the environmental conditions that maintain the QIs/SCIs at the desired target of Favourable Conservation Status;
- Identification of the threats/impacts – actual or potential that could negatively impact the environmental conditions of the QIs/SCIs within the European sites;
- Highlighting the activities of the proposed works that could give rise to significant negative impacts; and
- Identification of other plans or projects, for which in-combination impacts would likely have significant effects.

5. Natura 2000 sites

5.1 Designated sites within a 15km radius

In accordance with the European Commission Methodological Guidance (EC2001), a list of Natura 2000 Sites that can be potentially affected by the proposed project has been compiled. The l candidate SAC's (cSAC) and SPAs sites are identified in **Table 1** and shown in **Figure 3**. It is noted that use of a 15km radius is a precautionary measure, as impacts at this distance from the proposed development are highly unlikely in the absence of significant aqueous emissions.

The closest watercourse comprises of a small stream, located 200m west of the proposed development site. This stream flows in southerly direction to meet the River Suir, approximately 550m south of the proposed development site. The River Suir forms part of the Lower River Suir SAC (Site code 002137). The Lower River Suir SAC boundary is located 160m from the proposed development.

A theoretical source-pathway-receptor link has been identified between the source (Karting Track) and the receptor (Lower River Suir SAC) via a potential pathway (groundwater impacts and surface water run-off during construction phases). Qualifying species and habitats within these sites could therefore potentially be impacted via a reduction in water quality.

The Lower River Suir SAC is of considerable conservation significance for the occurrence of good examples of habitats and of populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive. Further detail on the Lower River Suir SAC (site code 002137) is provided below. Due to the distances involved and the lack of hydraulic or any other connections, no potential impact on other designated sites (i.e. Galtee Mountains SAC) has been identified.

Table 1. Designated sites and their location relative to the proposed development site.

Natura 2000 sites within the Zone of Influence (ZoI)	Code	Distance at the closest point
Special Area of Conservation (SAC)		
Lower River Suir	002137	Located 160m south-southeast. The closest watercourse comprises of a small stream, located 200m west of the proposed development site. This stream flows in southerly direction to meet the River Suir, approximately 550m south of the proposed development site. The River Suir forms part of the Lower River Suir SAC (Site code 002137). The Lower River Suir SAC boundary is located 160m from the proposed development. Therefore a source-pathway-receptor link has been identified between the source (Karting Track) and the receptor (Lower River Suir SAC) via a potential pathway (surface water run-off during construction phases).
Galtee Mountains	000646	Located 8.1km west. No pathway exists.

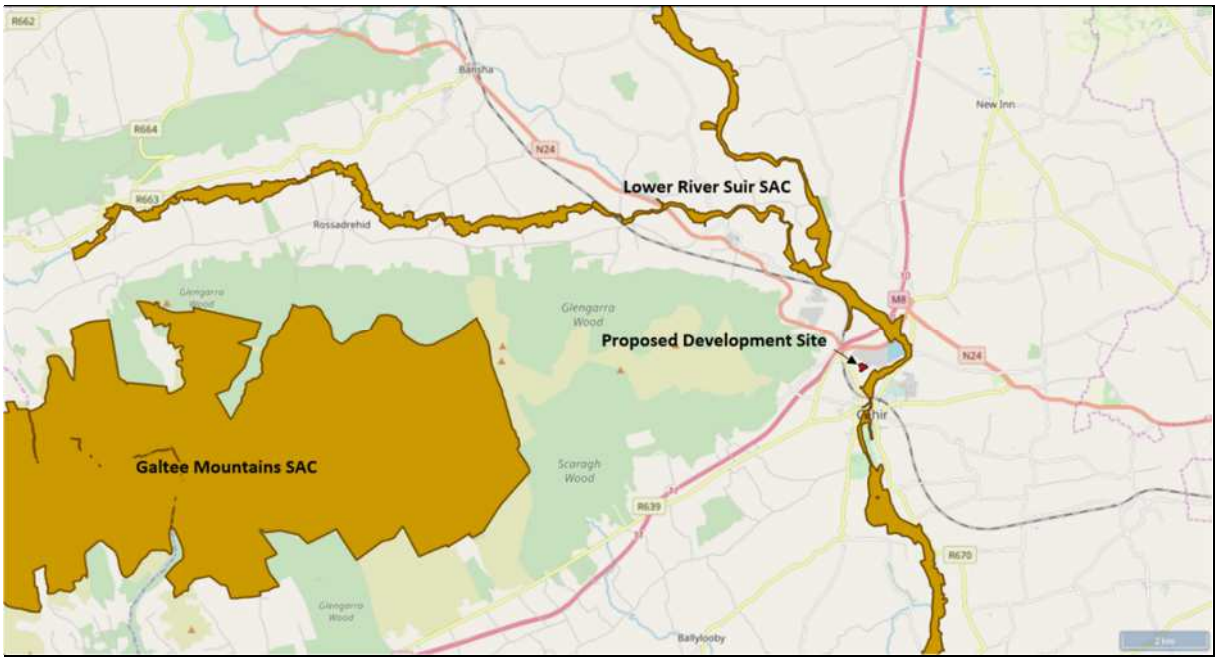


Figure 3. Natura 2000 Sites in relation to the proposed karting track development site at Cahir Abbey Industrial Estate, Cahir, Co. Tipperary.

5.2 Lower River Suir SAC

The River Suir system flows through the counties of Tipperary, Kilkenny and Waterford. The site consists of all of the freshwater stretches of the Suir immediately south of Thurles, the tidal stretches as far as the confluence with the Barrow/Nore immediately east of Cheekpoint in Co. Waterford, and many of the tributaries including the Clodiagh, the Lingaun, Anner, Nier, Tar, Aherlow and Multeen. Much of the system flows through Carboniferous limestone, though towards Waterford the geology changes to Old Red Sandstone and Ordovician bedrocks. The site supports a diverse range of habitats, including marsh, reedbeds, wet and dry grasslands, broad-leaved semi-natural woodlands, salt

marshes, tidal rivers and estuarine channels. Substantial areas of improved grassland and arable lands are included for water quality reasons.

The Lower River Suir SAC contains a range of Annex I habitats, including floating river vegetation, eutrophic tall herbs, alluvial forest, old oak woods, yew woods and salt meadows. The site is very important for the presence of a number of scarce and specialised Annex II animal species with particularly important populations of the fish species Salmon and Twaite Shad. Otter is widespread on the system, as is White-clawed Crayfish. The site supports two Annex I priority and five non-priority Annex I habitats. Four Annex I species of birds have been recorded within this SAC. The rare lichen *Lobaria pulmonaria*, an ancient woodland indicator, occurs at Portlaw Oak Woods. Further details on the Lower River Suir SAC is included in **Appendix A** of this report.

5.3 Natura 2000 sites – Features of interests and conservation objectives.

The EU Habitats Directive contains a list of habitats (Annex I) and species (Annex II) for which SACs must be established by Member States. Similarly, the EU Birds Directive contains lists of important bird species (Annex I) and other migratory bird species for which SPAs must be established. Those that are known to occur at a site are referred to as 'qualifying interests' and are listed in the Natura 2000 forms which are lodged with the EU Commission by each Member State. A 'qualifying interest' is one of the factors (such as the species or habitat that is present) for which the site merits designation. The National Parks and Wildlife Service (NPWS) are responsible for the designation of SACs and SPAs in Ireland.

The conservation objectives for the site are detailed in:

- NPWS (2017) Conservation Objectives: *Lower River Suir SAC 002137. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network. European and national legislation places a collective obligation on Ireland and its citizens to maintain at favourable conservation status sites designated as Special Areas of Conservation and Special Protection Areas. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level. Favourable conservation status of a habitat is achieved when its natural range, and area it covers within that range, is stable or increasing, and the ecological factors that are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and the conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when population data on the species concerned indicate that it is maintaining itself, and the natural range of the species is neither being reduced or likely to be reduced for the foreseeable future, and there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis. The species and habitats listed as qualifying interests for Lower River Suir SAC and specific conservation objectives are included in **Table 2** to **3**.

Table 2. Qualifying habitats for the Lower River Suir SAC

Habitat Code	Habitat	Conservation objective
1330	Atlantic Salt Meadows (*Glauco-Puccinellietalia maritimae*)	Restore

1410	Mediterranean Salt Meadows (*Juncetalia maritimi*)	Restore
3260	Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	Maintain
6430	*Hydrophilous* tall herb fringe communities of plains and of the montane to alpine levels	Maintain
91A0	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	Restore
91E0*	*Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)	Restore
91J0*	**Taxus baccata* woods of the British Isles	Restore

Restore = Restore favourable conservation condition, Maintain = Maintain favourable conservation condition

Table 3: Qualifying species for the Lower River Suir SAC

Species code	Species	Scientific name	Conservation objective
1029	Freshwater Pearl Mussel	*Margaritifera margaritifera*	Restore
1092	White-clawed crayfish	*Austropotamobius pallipes*	Maintain
1095	Sea Lamprey	*Petromyzon marinus*	Restore
1096	Brook Lamprey	*Lampetra planeri*	Restore
1099	River Lamprey	*Lampetra fluviatilis*	Restore
1103	Twaite shad	*Alosa fallax*	Restore
1106	Atlantic Salmon	*Salmo salar*	Restore
1355	Otter	*Lutra lutra*	Maintain

Restore = Restore favourable conservation condition, Maintain = Maintain favourable conservation condition

5.4. Water Quality data

5.4.1 EPA Biological Monitoring

The Environmental Protection Agency carries out a biological assessment of most river channels in the country on a regular basis. The assessments are used to derive Q values, indicators of the biological quality of the water. The biological health of a watercourse provides an indication of long-term water quality.

The EPA Q value scheme is summarised in **Table 4**. The relationship between the Q-rating system and the Water Framework Directive classification as defined by the Surface Waters Regulations 2009 (S.I. 272 of 2009) is shown in **Table 5**. EPA biological monitoring data for the closest freshwater monitoring sites applicable to the development site, in relation to flow direction and topography are shown in **Table 6** and **Figure 4**.

The Q Value system, which is used by the Environmental Protection Agency, describes the relationship between water quality and the macro-invertebrate community in numerical terms. The presence of pollution causes changes in flora and fauna of rivers. Well documented changes occur in the macro-invertebrate community in the presence of organic pollution: sensitive species are progressively replaced by more tolerant forms as pollution increases. Q5 waters have a high diversity of macro-invertebrates and good water quality, while Q1 have little or no macro-invertebrate diversity and unsatisfactory water quality.

The intermediate ratings Q1-2, Q2-3, Q3-4 and Q4-5 are used to denote transitional conditions, while ratings within parenthesis indicate borderline values. Great importance is attached to the EPA biotic indices, and consequently it is these data that are generally used to form the basis of water quality management plans for river catchments.

Treated wastewater from the proposed development site will ultimately be discharged to the River Suir via the Primary Discharge Point for the Cahir Agglomeration. The most recent Annual Environmental Report (2017) available for the Cahir WWTP notes that "*discharge from the wastewater treatment plant does not have an observable negative impact on the water quality*".

Table 4. EPA biotic index scheme.

Q value	Water quality	Pollution	Condition
5	Good	Unpolluted	Satisfactory
4	Fair	Unpolluted	Satisfactory
3	Doubtful	Moderately polluted	Unsatisfactory
2	Poor	Seriously polluted	Unsatisfactory
1	Bad	Seriously polluted	Unsatisfactory

Source: EPA

Table 5. Correlation between the WFD classification and Q values

Ecological status WFD	Q Values
High	Q5, Q4-5
Good	Q4
Moderate	Q3-4
Poor	Q3, Q2-3
Bad	Q2, Q1

Table 6. Q-values and locations

Q-Value location	Distance from development (Approximate)	Q-Value Score	Water Framework Directive Status
River Aherlow			
Killardry Br	4.7km northwest of the proposed development site (as the crow flies).	Q4 - 5 (2017)	High
River Suir			
2 km u/s Cahir	1.0km east-northeast of the proposed development site (as the crow flies).	Q3 - 4 (2017)	Moderate
Suir - Cahir Br	965m south of the proposed development site (as the crow flies).	Q3 - 4 (2005)	Moderate
Ford 1.8 km d/s Cahir Park Br	4.3km south of the proposed development site (as the crow flies).	Q3 - 4 (2017)	Moderate
Outeragh Stream			
Br u/s Suir R confl	1.9km northeast of the proposed development site (as the crow flies).	Q3 - 4 (2017)	Moderate

The more recent biological monitoring results (2017) from the River Suir indicate that water quality upstream and downstream relative to the proposed development site is slightly impaired.

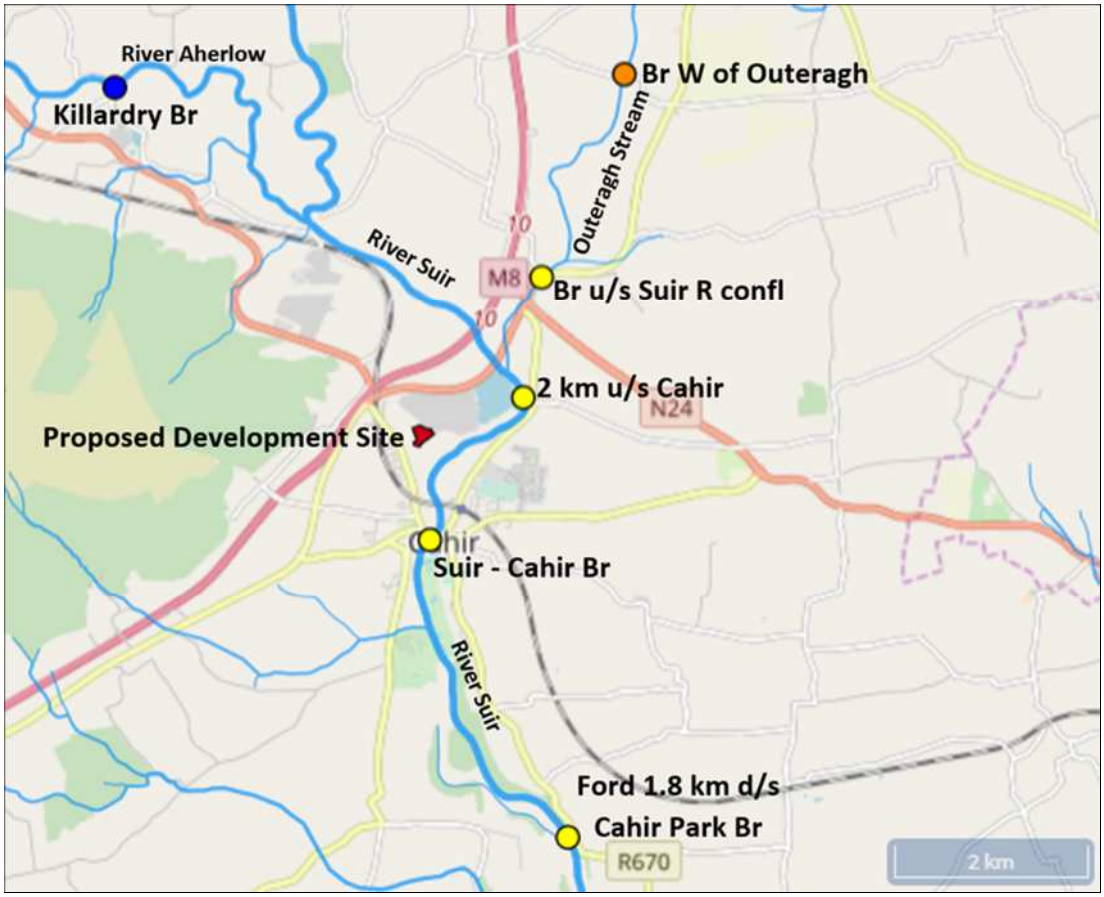


Figure 4. Proposed development site in relation to relevant EPA biological monitoring sites.

5.4.2 River Basin Management Plan for Ireland 2018 – 2021 (2nd Cycle)

The Water Framework Directive (WFD) sets out the environmental objectives which are required to be met through the process of river basin planning and implementation of those plans. Specific objectives are set out for surface water, groundwater and protected areas. The challenges that must be overcome in order to achieve those objectives are very significant. Therefore, a key purpose of the River Basin

Management Plan (RBMP) is to set out priorities and ensure that implementation is guided by these priorities.

The second-cycle RBMP aims to build on the progress made during the first cycle. Key measures during the first cycle included the licensing of urban waste-water discharges (with an associated investment in urban waste-water treatment) and the implementation of the Nitrates Action Programme (Good Agricultural Practice Regulations). The former measure has resulted in significant progress in terms both of compliance levels and of the impact of urban waste-water on water quality. The latter provides a considerable environmental baseline which all Irish farmers must achieve and has resulted in improving trends in the level of nitrates and phosphates in rivers and groundwater. It is acknowledged, however, that sufficient progress has not been made in developing and implementing supporting measures during the first cycle.

Overall, RBMP assesses the quality of water in Ireland and presents detailed scientific characterisation of our water bodies. The characterisation process also takes into account wider water quality considerations, such as the special water-quality requirements of protected areas. The characterisation process identifies those water bodies that are *At Risk* of not meeting the objectives of the WFD, and the process also identifies the significant pressures causing this risk. Based on an assessment of risk and pressures, a programme of measures has been developed to address the identified pressures and work towards achieving the required objectives for water quality and protected areas. Data relating to the watercourses within the study area is provided in **Table 7**.

Table 7. Water Framework Directive Data – Relevant data

Catchment: Suir (Code 16) – 2nd Cycle			
This catchment includes the area drained by the River Suir and all streams entering tidal water between Drumdowney and Cheekpoint, Co. Waterford, draining a total area of 3,542km². The largest urban centre in the catchment is Waterford City. The other main urban centres in this catchment are Carrick-on-Suir, Clonmel, Caher, Thurles, Tipperary, Fethard and Templemore. The total population of the catchment is approximately 184,860 with a population density of 52 people per km². The headwaters of the Suir are located on the northern flanks of the Devil's Bit Mountain in Co. Tipperary. The river flows through a wide limestone plain, past Thurles, where the Suir is joined by the River Drish and the Tipperary Clodiagh. The Suir continues towards Cashel where it is joined by the Multeen River from the west and onwards to Cahir before which the Fidaghta, Ard and Aherlow Rivers flow into the Suir from the Golden Vale on the northern side of the Galtee Mountains. To the south of Cahir, the Suir is joined by the Thonoge and Tar Rivers which drain the karstified valley between the Galtee and Knockmealdown mountains. The Suir then turns north near the village of Newcastle, meeting the Nier River which drains the western side of the Comeragh Mountains. The Suir then reaches Clonmel, after which it is joined by the River Anner. The Suir becomes tidal just before reaching Carrick-on-Suir, and is joined by several rivers between this point and Waterford city including the Lingaun, Portlaw Clodiagh, Pil, and Kilmacow Blackwater and then makes its way to the confluence with the Nore and Barrow Rivers east of Waterford City. The Suir estuary then turns south, flowing out to sea through Waterford Harbour between Dunmore East and Hook Head. The Suir catchment comprises 29 subcatchments with 168 river water bodies, seven lakes, four transitional water bodies, no coastal water bodies and 18 groundwater bodies (EPA, 2018).			
Suir – River Waterbodies relevant to the proposed project			
Waterbody	**Status**	**Risk**	**Date to Meet Environmental Objective**
Suir_130 – Located upstream of the proposed development site	Good	Not at risk	Unassigned
Suir_140 – This waterbody includes the section of the River Suir in close proximity to	Good	Not at risk	Unassigned

the proposed development site. The primary effluent emission point of the Cahir WWTP discharges into this section of river.			

Source: wfdireland map system & www.catchments.ie

5.4.3 Groundwater

The Geological Survey of Ireland (GSI) online database (www.gsi.ie) was consulted for available edaphic, geological and hydrological information of the site and its environs. The proposed works are primarily underlain by the Kiltorcan formation which is characterised by thick, non-red sandstones, often in channel forms, intraformational conglomerates and both red and non-red mudstones. Sandstones are yellow and coarse-grained as well as micaceous with white and red hues. They are interbedded with yellow.

The groundwater vulnerability at and in the vicinity of the proposed works, is displayed in **Figure 5**. The groundwater vulnerability is classified as high within the proposed development site. The aquifer within the proposed development site is classified as Regionally Important Aquifer – fissured bedrock (**Figure 6**).

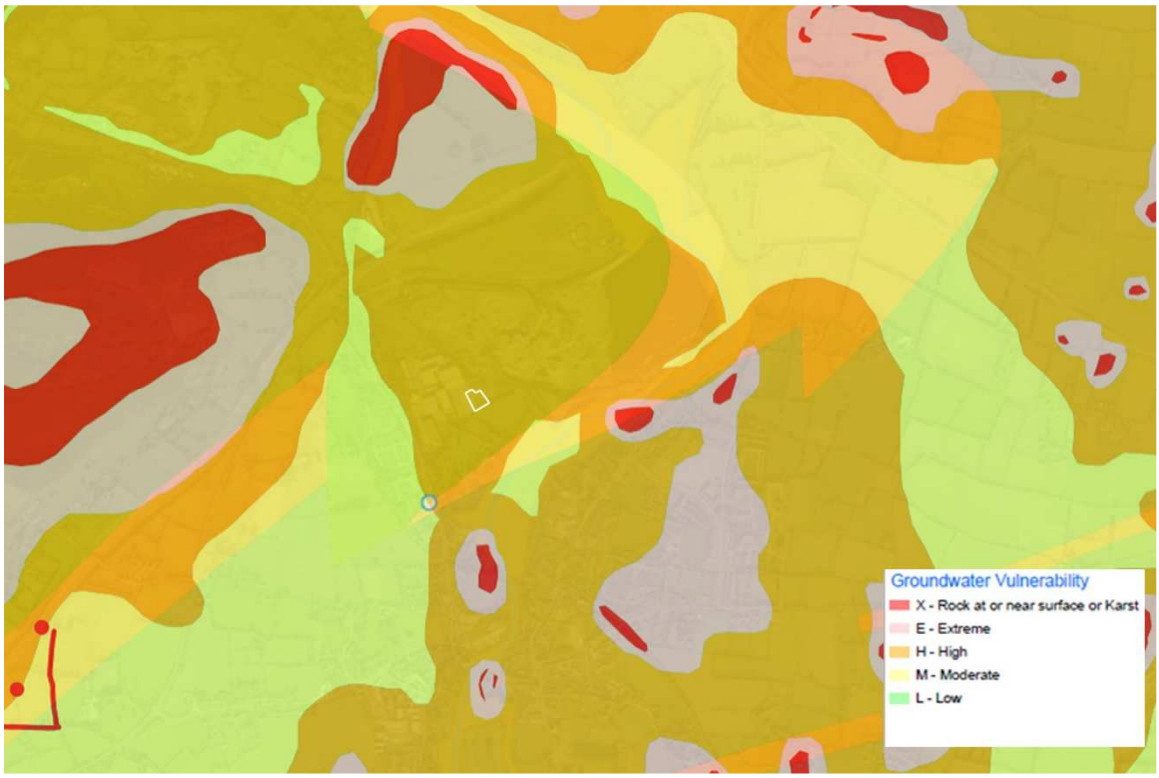


Figure 5. Groundwater vulnerability (proposed development site outlined in white)

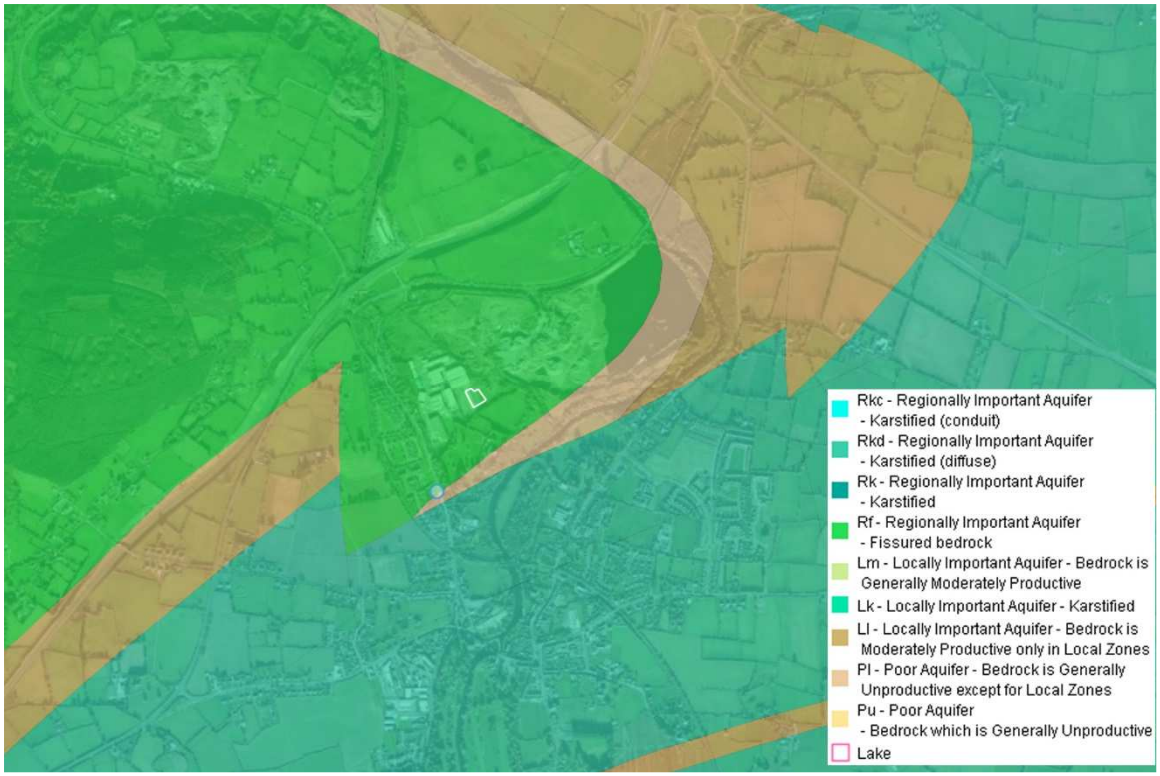


Figure 6. Aquifer classification (proposed development site outlined in white)

5.4 Flora and Fauna

5.4.1 Habitats

The terrestrial and aquatic habitats within or adjacent to the proposed development site were classified using the classification scheme outlined in the Heritage council *publication A Guide to Habitats in Ireland* (Fossitt, 2000) and cross referenced with Annex I qualifying habitats, where required. Habitats noted within the proposed development site are described below in **Table 8**. Habitats within the proposed works area are generally of low ecological value at a local level i.e. buildings and artificial surfaces (BL3), spoil and bare ground (ED2) and recolonising bare ground (ED3), and Scrub (WS1). Most of the species noted within the site including groundsel, willowherb and thistle species are early successional species which colonise bare ground. Small areas of scrub with willow are becoming established. Clusters of rowen, hawthorn and common cherry are planted along the south eastern boundary of the site as specified in a previously granted planning application. These trees are underplanted with laurel and holly to form a dense thick screen. The habitats impacted by the proposed development are highly modified and disturbed habitats, with low species diversity and low ecological value.

Table 8. Habitats recorded within the proposed development site on 9th October 2019

Habitats	Comments	Ecological value (NRA guidelines)
Buildings and artificial surfaces (BL3)	This is a highly modified habitat with low species diversity and little value for wildlife.	Local importance (Lower value)
Recolonising bare ground (ED3)	This is a highly modified habitat with low species diversity and limited value for wildlife. However, if left unmanaged recolonising bare ground can be important for wildlife and may support a diverse flora.	Local importance (Lower value)
Spoil and bare ground (ED2)	This is a highly modified habitat with low species diversity and little value for wildlife.	Local importance (Lower value)
Scrub (WS1)	Limited in extent.	Local importance (Lower value)
Treeline (WL1)	Non native species predominant	Local importance (Lower value)

None of the habitats recorded within the proposed development site are listed as qualifying habitats for the Lower River Suir SAC or correspond with Annex I habitats of the Habitats Directive.

5.4.2 Invasive species

No high-risk invasive species classified under Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 were recorded within the proposed works site.

A number of Buddleia plants was recorded along the wall of the eastern site boundary. Butterfly Bush / Buddleja (*Buddleja davidii*) was also noted within the site. This is classified as Amber Threat species by Invasive Species Ireland which under the right ecological conditions and may have an impact native species or habitats. The ecological risk from the spread of Amber listed species is minimal and at a local level these species are common. This species is relatively straight forward to control using mechanical removal.

5.4.3 Mammals

A mammal survey was undertaken of the site and surrounding area during the site inspection. The main focus of the mammal survey was Otter, which is listed on Annex II of the Habitats Directive, and is listed as qualifying interest of the Lower River Suir SAC.

Although rare in parts of Europe they are widely distributed in the Irish countryside in both marine and freshwater habitats. Otters are solitary and nocturnal and as such are rarely seen. Thus, surveys for otters rely on detecting signs of their presence. These include spraints (faeces), anal gland secretions, paths, slides, footprints and remains of prey items. Spraints are of particular value as they are used as territorial markers and are often found on prominent locations such as grass tussocks, stream junctions and under bridges. In addition, they are relatively straightforward to identify.

Otters occasionally dig out their own burrows but generally they make use of existing cavities as resting placing or for breeding sites. Suitable locations include eroded riverbanks, under trees along rivers, under fallen trees, within rock piles or in dry drainage pipes or culverts etc. If ground conditions are suitable the holt may consist of a complex tunnel and chamber system. Otters often lie out above ground especially within reed beds where depressions in the vegetation called “couches” are formed. Generally, holts or resting areas can be located by detecting signs such as spraints or tracks.

In contrast natal holts which are used by breeding females can be extremely difficult to locate. They are often located a considerable distance from any aquatic habitats and otters may also use habitats adjoining small streams with minimal or no fish populations. In addition, natal holts are usually carefully hidden and without obvious sprainting sites. Otters do not have a well-defined breeding season.

It is noted that Otters are largely nocturnal, particularly in areas subject to high levels of disturbance as evidenced by the presence of otters in the centre of Irish cities. Thus, they are able to adapt to increased noise and activity levels; however, breeding holts are generally located in areas where disturbance is lower.

No signs of Otter were recorded within the proposed development site or in proximity to it. The habitats noted within the site are not of value for Otter.

There are no buildings suitable for bats within the proposed development. There are no sufficiently mature trees to support roosting bats. A number of mature oak trees are located adjacent to the southern site boundary which may provide roosting habitat for bats. However, as they are located outside the site boundary they will not be impacted by the proposed development.

5.4.4 Birds

During the site survey, all birds seen or heard within the development site were recorded. During the site survey, all birds seen or heard within the development site were recorded. The majority of birds utilising the site were common in the local landscape. Certain bird species are listed by BirdWatch Ireland as Birds of Conservation Concern in Ireland (BOCCI). These are bird species suffering declines in population size. BirdWatch Ireland and the Royal Society for the Protection of Birds have identified and classified these species by the rate of decline into Red and Amber lists. Red List bird species are of high conservation concern and the Amber List species are of medium conservation. Green listed species are regularly occurring bird species whose conservation status is currently considered

favourable. Birds species listed in Annex I of the Birds Directive (2009/147/EC) are considered a conservation priority. Species recorded within the site are shown in **Table 9**.

Table 9.8: Bird Species recorded site surveys

Species		**Birds Directive Annex**			**BOCCI**	
		I	**II**	**III**	**Red List**	**Amber List**
Erithacus rubecula	Robin					X
Larus argentatus	Herring Gull				X	
Turdus merula	Blackbird					
Prunella modularis	Dunnock					
Troglodytes troglodytes	Wren					
Corvus frugilegus	Rook					
Corvus monedula	Jackdaw					
Pica pica	Magpie					
Columba sp.	Feral pigeon					
Fringilla coelebs	Chaffinch					
Corvus cornix	Hooded Crow					
Parus caeruleus	Blue Tit					
Motacilla alba yarrellii	Pied Wagtail					
Parus major	Great Tit					

Symbol	**Description**
I	**Annex 1**: species and sub-species are particularly threatened. Member States must designate Special Protection Areas (SPAs) for their survival and all migratory bird species.
II	**Annex 2**: bird species can be hunted. However, the hunting periods are limited and hunting is forbidden when birds are at their most vulnerable: during their return migration to nesting areas, reproduction and the raising of their chicks.
III	**Annex 3**: overall, activities that directly threaten birds, such as their deliberate killing, capture or trade, or the destruction of their nests, are banned. With certain restrictions, Member States can allow some of these activities for species listed here.

Vegetation on the boundaries of the existing site and the early successional, seed producing species found within disturbed ground habitats provide some feeding/nesting resources for birds. Overall, the proposed development site is of local value for terrestrial bird species that are relatively common in the Irish countryside and/or urban areas. There are no terrestrial features or habitats of particular value, which would differentiate the proposed development site from large areas of similar habitat in the surrounding countryside. There may be a short-term impact on feeding patterns during construction but the long-term impact is predicted to be negligible.

6. Potential impacts

The potential impacts associated with the proposed development are discussed in the following section with respect to their likelihood to have significant impacts on Natura 2000 sites. As part of the assessment direct, indirect and cumulative impacts were considered. Direct impacts refer to habitat loss or fragmentation arising from land-take requirements for development. Indirect and secondary impacts do not have a straight-line route between cause and effect, and it is potentially more challenging to ensure that all the possible indirect impacts of the project/plan - in combination with other plans and projects have been established.

As part of the assessment the potential for impacts associated with the development were reviewed as outlined below:

- Potential impacts from loss of habitat.
- Potential impacts from noise and disturbance
- Potential impacts on water quality
- Impacts from invasive species
- Cumulative impacts

6.1 Potential impacts for loss of habitat

The proposed works area is not located within a designated site and the habitats recorded within the works area do not correspond to habitats listed on Annex I of the Habitats Directive or to qualifying habitats for the Lower River Suir SAC. The habitats recorded within the proposed development site are considered of a low value at a local level and are relatively common in the surrounding landscape.

The recorded habitats are considered of low value at a local level and are common in the surrounding landscape. No potential for habitat fragmentation has been identified. The proposed development will not result in any loss of habitat within Natura 2000 sites.

6.2 Potential impacts from noise and disturbance

The potential effects and impacts of disturbance have been widely recognised in wildlife conservation legislation, as has the need to develop conservation measures for birds whilst taking human activities into account. Article 6 of the Habitats Directive (92/42/EEC) requires member states to *"Take appropriate steps to avoid the deterioration of natural habitats and the habitats of species as well as the disturbance of the species for which the areas have been designated, in so far as such disturbance could be significant in relation to the objectives of this Directive"*. This specifically relates to conservation measures concerning Annex II species.

Potentially increased noise and disturbance associated with the site works or with the operational phase once the karting track is active, could cause disturbance/displacement of fauna. If of sufficient severity, there could be impacts on reproductive success. The Lower River Suir SAC is located approximately 160m from the proposed development site. The habitats within the proposed development area are not of value for any of the species listed as QIs for this Natura 2000 site.

No signs of Otter were recorded within the proposed development site or in proximity to it. The habitats noted within the site are not of value for Otter.

During the construction stage, there may be short-term increases in disturbance. However, given the scale and temporary nature of the works and the distance involved no impact on QIs for the Lower River Suir SAC will occur. Likewise given the absence of suitable habitats for QIs, no impact from increased noise and disturbance will occur once the karting track is operational.

6.3 Potential impacts on Water Quality and Biodiversity (Flora and fauna)

During the construction phase potential impacts on aquatic habitats which can arise from this type of development include increased silt levels in surface water run-off, inadvertent spillages of hydrocarbons from fuel and hydraulic fluid.

High levels of silt in surface water run-off during construction activities, can impact on fish species, in particular salmonids. If of sufficient severity, adult fish could theoretically be affected by increased silt levels as gills may become damaged by exposure to elevated suspended solids levels. If of sufficient severity, aquatic invertebrates may be smothered by excessive deposits of silt from suspended solids.

Freshwater Pearl Mussel and White-clawed Crayfish, both of which are QI's for the Lower River Suir SAC, are particularly sensitive to increases in silt levels (Bauer 1983; Buddensiek *et al.* 1993; Reynolds 1998). In areas of stony substrate, silt deposits may result in a change in the macro-invertebrate species composition, favouring less diverse assemblages and impacting on sensitive species. Aquatic plant communities may also be affected by increased siltation. Submerged plants may be stunted and photosynthesis may be reduced. Such run-off if severe could potentially impact on water quality which could also impact on fish stocks including QI's for the Lower River Suir River SAC i.e. Sea Lamprey, Brook Lamprey, River Lamprey, Twaite Shad and Atlantic Salmon. This in turn could impact on populations of Otter. It is noted that the nearest watercourse is the an unnamed stream located 200m west of the proposed development site.

The risk of significant silt levels being deposited within watercourses down gradient of the proposed works during the construction phase of the development is considered low and due to the dilution provided in the freshwater and estuarine environment. Furthermore, naturally fluctuating levels of silt, in the estuarine environment mean impacts are only likely to arise from extremely severe levels of siltation. Therefore, given the small scale of the proposed development and the absence of any significant excavation works, no risk of significant siltation has been identified. Given the location of the works, the distance of the proposed development from the freshwater and estuarine environment, the robust nature of estuarine qualifying habitats (i.e. Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] and Mediterranean salt meadows (*Juncetalia maritime*) [1410]) and the dilution provided in the freshwater habitats (i.e. Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260], no impacts on water quality due to elevated silt levels during construction will occur.

Inadvertent spillages of hydrocarbons during construction could introduce toxic chemicals into the aquatic environment via surface water run-off or groundwater contamination and have a direct toxicological impact on habitats and fauna. Given the small scale of the development and the distance from sensitive aquatic receptors, no impacts on water quality due to such minor spills during construction, will occur. The risk from minor spills of hydrocarbons during construction is considered negligible and given the distance of the River Suir from the proposed development site no impact is predicted to occur.

During operation surface water will be treated on site for hydrocarbon contamination and ultimately treated surface water will be discharged to ground. Karts will run on gas. This will not have an effect on the qualifying interests and conservation objectives for the Lower River Suir River SAC. There are no high value habitats or watercourses in proximity to the proposed works and the habitats recorded on site do not correspond to the habitats listed as qualifying interests for the Lower River Suir River SAC.

Therefore, no potential impacts on this Natura 2000 sites as a result of impacts on water quality have been identified.

6.4 Potential impacts from the spread of invasive species

There is potential during the construction phase and operational phase of the proposed works for invasive species to be spread outside the site boundary.

No high risk invasive species were recorded within the site development boundary. Therefore, no impacts from invasive species on the Lower River Suir SAC will occur.

6.5 Cumulative Impacts

Cumulative impacts refer to a series of individually impacts that may, in combination, produce a significant impact. The underlying intention of this in combination provision is to take account of cumulative impacts from existing or proposed plans and projects and these will often only occur over time.

Table 10. Plans and projects for cumulative assessment.

Plans and Projects	Key Policies/Issues/Objectives Directly Related to the Conservation of the Natura 2000 Network	Impact
Land Use and Spatial Plans		
South Tipperary Development Plan 2009 – 2015 (As Varied)	**Policy LH5:** Biodiversity, Trees and Habitats It is the policy of the Council to conserve, protect and enhance the county's bio-diversity, including trees and hedgerows, in accordance with the County Biodiversity Plan (and any review thereof) and the standards set out in this Plan (as varied). **Policy LH6: Natura 2000 Sites and Protected Species** It is the policy of the Council to ensure the protection, integrity and conservation of existing and candidate Natura 2000 sites and Annex I and II species listed in EU Directives. Where it is determined that a development may independently, or cumulatively, impact on the conservation values of existing or proposed Natura 2000 sites, the Council will require planning applications to be accompanied by a Natura Impact Statement in accordance with 'Appropriate Assessment of Plans and Projects, Guidelines for Planning Authorities', (DEHLG 2009) or any amendment thereof. **Policy LH8: Inland Waters and Riparian Zones**. It is the policy of the Council to protect the ecological status and quality of watercourses. In order to maintain the natural function of existing ecosystems associated with water courses and their riparian zones and to encourage sustainable public access to waterbodies, the Council will require an undisturbed edge or buffer zone to be maintained, where appropriate, between new developments and riparian zones of water bodies. **Policy LH11: Control of Invasive Species** It is the policy of the Council to protect plant and animal species and habitats as identified by the Habitats Directive, Birds Directive, Wildlife Act (1976) and Wildlife	A number of strategies, policies and objectives are set out in the South Tipperary Development Plan 2009 – 2015 (As Varied) for the protection of the natural environment. The implementation and compliance with key environmental policies, issues and objectives will result in positive in-combination effects to European sites. The implementation of this plan will not contribute to in-combination or cumulative impacts with the proposed development.

	(Amendment) Act 2000 from invasive species and to seek control and manage the spread of invasive plant and animal species in the county. **Policy LH12: Water Framework Directive and River Basin Management Plans** It is the policy of the Council to protect and improve the county's water resources and support an integrated and collaborative approach to local catchment management in order to ensure the successful implementation of the River Basin Management Plans (or any review thereof)	
Cahir Local Area Plan 2011	**Policy ENV 10: River Suir** - It is the policy of the Council to ensure that all development applications likely to have significant effects on the Lower River Suir Special Area of Conservation are appropriately assessed, and in particular in relation to maintaining water quality, and avoiding siltation and erosion.	A number of strategies, policies and objectives are set out in the Cahir Local Area Plan 2011 for the protection of the natural environment. The implementation and compliance with key environmental policies, issues and objectives will result in positive in-combination effects to European sites. The implementation of this plan will not contribute to in-combination or cumulative impacts with the proposed development.
River Basin Management Plan 2018-2021	The project should comply with the environmental objectives of the Irish RBMP which are to be achieved generally by 2021. • Ensure full compliance with relevant EU legislation • Prevent deterioration • Meeting the objectives for designated protected areas • Protect high status waters • Implement targeted actions and pilot schemes in focus sub-catchments aimed at: targeting water bodies close to meeting their objective and addressing more complex issues which will build knowledge for the third cycle.	The implementation and compliance with key environmental policies, issues and objectives of this management plan will result in positive in-combination effects to European sites. The implementation of this plan will have a positive impact for the biodiversity. It will not contribute to in-combination or cumulative impacts with the proposed development.
Fisheries Plans		
Inland Fisheries Ireland Corporate Plan 2016 -2020	To ensure that Ireland's fish populations are managed and protected to ensure their conservation status remains favourable. That they provide a basis for a sustainable world class recreational angling product,	The implementation and compliance with key environmental issues and objectives of this corporate plan will result in positive on-

The Inland Fisheries Act 2010.	and that pristine aquatic habitats are also enjoyed for other recreational uses. To develop and improve fish habitats and ensure that the conditions required for fish populations to thrive are sustained and protected. To grow the number of anglers and ensure the needs of IFI's other key stakeholders are being met in a sustainable conservation focused manner. EU (Quality of Salmonid Waters) Regulations 1988. All works during development and operation of the project must aim to conserve fish and other species of fauna and flora habitat; biodiversity of inland fisheries and ecosystems and protect spawning salmon and trout.	combination effects to European sites. The implementation of this corporate plan will have a positive impact for biodiversity of inland fisheries and ecosystems. It will not contribute to in-combination or cumulative impacts with the proposed works.
Other Water Services Strategic Plans		
Irish Water Capital Investment Plan 2014-2016	Proposals to upgrade and secure water services and water treatment services countrywide.	Likely net positive impact due to water conservation and more effective treatment of water.
Water Services Strategic Plan (WSSP, 2015)	Irish Water has prepared a Water Services Strategic Plan (WSSP, 2015), under Section 33 of the Water Service No. 2 Act of 2013 to address the delivery of strategic objectives which will contribute towards improved water quality and biodiversity requirements through reducing: • Habitat loss and disturbance from new / upgraded infrastructure; • Species disturbance; • Changes to water quality or quantity; and • Nutrient enrichment /eutrophication.	The WSSP sets out the challenges we face as a country in relation to the provision of water services and identifies strategic national priorities. It includes Irish Water's short, medium and long-term objectives and identifies strategies to achieve these objectives. No likely significant in-combination effects are envisaged.
Other Plans and Projects		
NPWS Conservation Management Plans	The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species	The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. Conservation objectives aim to define favourable conservation condition for a particular habitat or species at that site to ensure the ecological integrity of these sites is maintained or restored. The resultant effects of conservation objectives are a net positive and there is no potential for in

		combination effects on European sites.
Planning applications with Tipperary County Council	The following applications have been submitted in the last 5-year period for the townlands for Caherabbey Lower and Caherabbey Upper. 19600040 Michael and Celine Kennedy (i) an existing porch to an existing dwelling as well as Planning Permission (ii) to extend an existing dwelling and all associated site works 17600012 Buttimer Engineering (i) the demolition of an existing link between 2 no. existing buildings in order to separate buildings and properties so that one building will remain wholly within the site of the planning application along with the making good of the facades on each building, (ii) the change of use of an existing building from a commercial use to an industrial use, (iii) raising the height of a portion of the existing building as described in ii above, (iv) to extend the building described in ii above to include ancillary support space, (v) to extend the building described in ii above to include plant equipment , (vi) the demolition of an existing site store, (vii) the erection of a new industrial unit (viii) the erection of a new site security hut, (ix) the erection of a new office block of which it's use is ancillary to the use of what will be the existing building described in ii above and the proposed building in vii above (x) site works to include new concrete yard around the building described in vii above, connection of foul sewer from building described in viii and ix above to an existing on-site pumping station and construction of on-site soakaways for surface water drainage (xi) and all associated signage throughout the development, 3 no. flagpoles and all other site development works and all other development works 19600318 Pauline O'Donnell construction of a single storey sunroom extension to the front of existing single storey dwelling house 17600003 James O'Connor construction of a dwelling, garage, effluent treatment system and entrance with all associated site works 16600843 Dan Casey construction of an open plan lean-to structure at the rear and side of the existing premises 16600470 Brothers of Charity. alterations, change of 2 windows to doors, on the south and east elevations of the residential unit 16600408 Merfat Barsoam the following works: (i) changes to front elevation (ii) conversion of previous shop area to residential 15600835 Thomas and Breda Hacket 1.for minor works to main house including modifications to existing bathroom layouts and the provision of an	Future developments will only be granted permission where discharges from same meet with relevant water quality standards. Therefore there will be no negative impacts on the Lower River Suir SAC as a result of these developments.

	additional conservation rooflight, replacement of modern external door at basement level with an appropriate door and minor modifications to basement layout 15600818 Michael Murphy for the construction of an extension to commercial warehouse and all associated site development works 14600558 Dan Casey. To construct a single storey storage building and all associated site works as well as retention permission for an existing on site storage hut and all associated site works	

The potential for the proposed works to indirectly impact the Lower River Suir SAC has been assessed. Potential cumulative impacts on the site may arise owing to an alteration to water quality. Deterioration in water quality can occur as an indirect consequence of point source or diffuse pollution, which in turn changes the aquatic environment and reduces its capacity to support certain plants and animals. This leads to potential negative consequences for the qualifying interests that rely on the maintenance of water quality within the Natura 2000 site.

Plans and projects that could cause potential in-combination effects with the proposed development to the identified European sites, which have been considered for the purposes of this report are show in **Table 10.** However, in the absence of any significant impact associated with this project no cumulative impacts on water quality have been identified. Similarly, no significant cumulative impacts in relation to noise and disturbance have been identified.

Pressures identified as having high impacts on the Lower River Suir (NPWS, 2007a) include urbanised areas, human habitation, agricultural fertilisation, urbanisation, residential and commercial development discharge and pollution to surfaces water.

7. Screening conclusion and statement

This AA screening report has been prepared to assess whether the proposed development, individually or in-combination with other plans or projects, and in view of best scientific knowledge, is likely to have a significant effect on any European site(s).

The screening exercise was completed in compliance with the relevant European Commission guidance, national guidance, and case law. The potential impacts of the proposed development have been considered in the context of the European sites potentially affected, their qualifying interests or special conservation interests, and their conservation objectives.

Through an assessment of the source-pathway-receptor model, which considered the ZoI of effects from the proposed development and the potential in-combination effects with other plans or projects, the following was concluded:

The proposed Karting Track at Cahir Abbey, Cahir, County Tipperary, either alone or in-combination with other plans and/or projects, does not have the potential to significantly affect any European Site, in light of their conservation objectives. Therefore, a Stage 2 Appropriate Assessment is deemed not to be required.

References

Fossitt, J. A. (2000). A Guide to Habitats in Ireland. The Heritage Council of Ireland Series

Environmental Protection Agency Ireland (http://www.epa.ie/)

Invasivespecies Ireland (http://invasivespeciesireland.com/)

National Biodiversity Data Centre (http://www.biodiversityireland.ie/)

National Parks and Wildlife Service website (www.npws.ie)

Dba, 2018. Noise impact assessment: Proposed karting facility at Cahir Abbey Industrial Estate, Cahir, Co. Tipperary

EPA, 2018. Suir Catchment Assessment 2010-2015 (HA 16).

Maitland, P.S. and R.N. Campbell, 1992. Freshwater fishes of the British Isles. HarperCollins Publishers, London.368 p.

NPWS (2017) Conservation Objectives: Lower River Suir SAC 002137. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

O'Connor, W. (2007) A Survey of Juvenile Lamprey Populations in the Corrib and Suir Catchments. Irish Wildlife Manuals No. 26. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Rooney, S.M., O'Gorman, N.M., Cierpial, D. and King, J.J. (2014) National Programme: Habitats Directive and Red Data Book Species Executive Report 2013. Inland Fisheries Ireland, Swords Business Campus, Swords, Co. Dublin, Ireland.

Appendix 1

Natura 2000 Site Synopsis - Lower River Suir (Site Code: 002137)

This site consists of the freshwater stretches of the River Suir immediately south of Thurles, the tidal stretches as far as the confluence with the Barrow/Nore immediately east of Cheekpoint in Co. Waterford and many tributaries including the Clodiagh in Co. Waterford, the Lingaun, Anner, Nier, Tar, Aherlow, Multeen and Clodiagh in Co. Tipperary. The Suir and its tributaries flows through the counties of Tipperary, Kilkenny and Waterford. Upstream of Waterford City, the swinging meanders of the Suir crisscross the Devonian sandstone rim of hard rocks no less than three times as they leave the limestone-floored downfold below Carrick. In the vicinity of Carrick-on-Suir the river follows the limestone floor of the Carrick Syncline. Upstream of Clonmel the River and its tributaries traverse Upper Palaeozoic Rocks, mainly the Lower Carboniferous Visean and Tournaisian. The freshwater stretches of the Clodiagh River in Co. Waterford traverse Silurian rocks, through narrow bands of Old Red Sandstone and Lower Avonian Shales before reaching the carboniferous limestone close to its confluence with the Suir. The Aherlow River flows through a Carboniferous limestone valley, with outcrops of Old Red Sandstone forming the Galtee Mountains to the south and the Slievenamuck range to the north. Glacial deposits of sands and gravels are common along the valley bottom, flanking the present-day river course.

The site is a candidate SAC selected for the presence of the priority habitats on Annex I of the E.U. Habitats Directive - alluvial wet woodlands and Yew Wood. The site is also selected as a candidate SAC for floating river vegetation, Atlantic salt meadows, Mediterranean salt meadows, old oak woodlands and eutrophic tall herbs, all habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for the following species listed on Annex II of the same directive - Sea Lamprey, River Lamprey, Brook Lamprey, Freshwater Pearl Mussel, Crayfish, Twaite Shad, Atlantic Salmon and Otter.

Alluvial wet woodland is declining habitat in Europe as a result of drainage and reclamation. The best examples of this type of woodland in the site are found on the islands just below Carrick-on-Suir and at Fiddown Island. Species occurring here include Almond Willow (Salix triandra), White Willow (S. alba), Grey Willow (S. cinerea), Osier (S. viminalis), with Iris (Iris pseudacorus), Hemlock Water-dropwort (Oenanthe crocata), Angelica (Angelica sylvestris), Pendulus Sedge (Carex pendula), Meadowsweet (Filipendula ulmaria) and Valerian (Valeriana officinalis). The terrain is littered with dead trunks and branches and intersected with small channels which carry small streams to the river. The bryophyte and lichen floras appear to be rich and require further investigation. A small plot is currently being coppiced and managed by National Parks and Wildlife. In the drier areas the wet woodland species merge with other tree and shrub species including Ash (Fraxinus excelsior), Hazel (Corylus avellana), Hawthorn (Crataegus monogyna) and Blackthorn (Prunus spinosa). This adds further to the ecological interest of this site.

Eutrophic tall herb vegetation occurs in association with the various areas of alluvial forest and elsewhere where the flood-plain of the river is intact. Characteristic species of the habitat include Meadowsweet (Filipendula ulmaria), Purple Loosestrife (Lythrum salicaria), Marsh Ragwort (Senecio aquaticus), Ground Ivy (Glechoma hederacea) and Hedge Bindweed (Calystegia sepium).

Old oak woodlands are also of importance within the cSAC. The best examples are seen in Portlaw Wood which lies on both sides of the Clodiagh River. On the south-facing side the stand is more open and the Oaks (mainly Quercus robur) are well grown and spreading. Ivy (Hedera helix) and Bramble (Rubus fruticosus) are common on the ground, indicating relatively high light conditions. Oak regeneration is dense, varying in age from 0-40 years and Holly (Ilex aquifolium) is fairly common but mostly quite young. Across the valley, by contrast, the trees are much more closely spaced and though taller are poorly grown on average. There are no clearings; large Oaks extend to the boundary wall. In the darker conditions, Ivy is much rarer and Holly much more frequent, forming a closed canopy in places. Oak regeneration is uncommon since there are as yet few natural clearings. The shallowness

of the soil on the north-facing slope probably contributes to the poor tree growth there. The acid nature of the substrate has induced a “mountain” type Oakwood community to develop. There is an extensive species list present throughout including an abundance of mosses, liverworts and lichens. The rare lichen Lobaria pulmonaria, an indicator of ancient woodlands, is found.

Inchinsquillib Wood consists of three small separate sloping blocks of woodland in a valley cut by the young Multeen River and its tributaries through acidic Old Red Sandstone, and Silurian rocks. Two blocks, both with an eastern aspect, located to the north of the road, are predominantly of Sessile oak (Quercus petraea) and Hazel, with Downy Birch (Betula pubescens), Ash and Holly. The ground flora is quite mixed with for example Wood sedge (Carex sylvatica), Bluebell (Hyacinthoides non-scriptus), Primrose (Primula vulgaris), Wood-sorrel (Oxalis acetosella), Pignut (Conopodium majus) and Hard fern (Blechnum spicant). The base poor nature of the underlying rock is, to some extent masked by the overlying drift. The third block, to the south of the road, and with a northern aspect, is a similar although less mature mixture of Sessile Oak, Birch and Holly, the influence of the drift is more marked, with the occurrence of Wood anemone (Anemone nemorosa) amongst the ground flora.

Floating river vegetation is evident in the freshwater stretches of the River Suir and along many of its tributaries. Typical species found include Canadian Pondweed (Elodea canadensis), Milfoil (Myriophyllum spp.), Fennel Pondweed (Potamogeton pectinatus), Curled Pondweed (P. crispus), Perfoliate Pondweed (P. perfoliatus), Pond Water-crowfoot (Ranunculus peltatus), other Crowfoots (Ranunculus spp.) and the moss Fontinalis antipyretica. At a couple of locations along the river, Oppositeleaved Pondweed (Groenlandia densa) occurs. This species is protected under the Flora (Protection) Order, 1999.

The Aherlow River is fast-flowing and mostly follows a natural unmodified river channel. Submerged vegetation includes the aquatic moss Fontinalis antipyretica and Stream Water-crowfoot (Ranunculus pencillatus), while shallow areas support species such as Reed Canary-grass (Phalaris arundinacea), Brooklime (Veronica beccabunga) and Water Mint (Mentha aquatica). The river bank is fringed in places with Alder (Alnus glutinosa) and Willows (Salix spp.).

The Multeen River is fast flowing, mostly gravel-bottomed and appears to follow a natural unmodified river channel. Water Crowfoots occur in abundance and the aquatic moss Fontinalis antipyretica is also common. In sheltered shallows, species such as Water-cress (Rorippa nasturtium-aquaticum) and Water-starworts (Callitriche spp.) occur. The river channel is fringed for most of its length with Alder, Willow and a narrow strip of marshy vegetation.

Salt meadows occur below Waterford City in old meadows where the embankment is absent, or has been breached, and along the tidal stretches of some of the in-flowing rivers below Little Island. There are very narrow, non-continuous bands of this habitat along both banks. More extensive areas are also seen along the south bank at Ballynakill, the east side of Little Island, and in three large salt meadows between Ballynakill and Cheekpoint. The Atlantic and Mediterranean sub types are generally intermixed. The species list is extensive and includes Red Fescue (Festuca rubra), Oraches (Atriplex spp.), Sea Aster (Aster tripolium), Sea Couch Grass (Elymus pycnanthus), frequent Sea Milkwort (Glaux maritima), occasional Wild Celery (Apium graveolens), Parsley Water-dropwort (Oenanthe lachenalii), English Scurvygrass (Cochlearia anglica) and Sea Arrowgrass (Triglochin maritima). These species are more representative of the Atlantic sub-type of the habitat. Common Cord-grass (Spartina anglica), is rather frequent along the main channel edge and up the internal channels. The legally protected (Flora (Protection) Order, 1999) Meadow Barley (Hordeum secalinum) grows at the landward transition of the saltmarsh. Sea Rush (Juncus maritimus), an indicator of the Mediterranean salt meadows, also occurs.

Other habitats at the site include wet and dry grassland, marsh, reed swamp, improved grassland, coniferous plantations, deciduous woodland, scrub, tidal river, stony shore and mudflats. The most dominant habitat adjoining the river is improved grassland, although there are wet fields with species

such as Yellow Flag (Iris pseudacorus), Meadow Sweet (Filipendula ulmaria), Rushes (Juncus spp.), Meadow Buttercup (Ranunculus acris) and Cuckoo Flower (Cardamine pratensis).

Cabragh marshes, just below Thurles, lie in a low-lying tributary valley into which the main river floods in winter. Here there is an extensive area of Common Reed (Phragmites australis) with associated marshland and peaty fen. The transition between vegetation types is often well displayed. A number of wetland plants of interest occur, in particular the Narrow-leaved Bulrush (Typha angustifolia), Bottle Sedge (Carex rostrata) and Blunt-flowered Rush (Juncus subnodulosus). The marsh is naturally eutrophic but it has also the nutritional legacy of the former sugar factory which discharged into it through a number of holding lagoons, now removed. Production is high which is seen in the size of such species as Celery-leaved Buttercup (Ranunculus sceleratus) as well as in the reeds themselves.

Throughout the Lower River Suir site are small areas of woodland other than those described above. These tend to be a mixture of native and non-native species, although there are some areas of semi-natural wet woodland with species such as Ash and Willow. Cahir Park Woodlands is a narrow tract of mixed deciduous woodland lying on the flatlying floodplain of the River Suir. This estate woodland was planted over one hundred years ago and it contains a large component of exotic tree species. However, due to original planting and natural regeneration there is now a good mix of native and exotic species. About 5km north west of Cashel, Ardmayle pond is a long, possibly artificial water body running parallel to the River Suir. It is partly shaded by planted Lime (Tilia hybrids), Sycamore (Acer pseudoplatanus) and the native Alder. Growing beneath the trees are shade tolerant species such as Remote sedge (Carex remota).

The site is of particular conservation interest for the presence of a number of Annex II animal species, including Freshwater Pearl Mussel (Margaritifera margaritifera and M. m. durrovensis), Freshwater Crayfish (Austropotamobius pallipes), Salmon (Salmo salar), Twaite Shad (Alosa fallax fallax), three species of Lampreys - Sea Lamprey (Petromyzon marinus), Brook Lamprey (Lampetra planeri) and River Lamprey (Lampetra fluviatilis) and Otter (Lutra lutra). This is one of only three known spawning grounds in the country for Twaite Shad.

The site also supports populations of several other animal species. Those which are listed in the Irish Red Data Book include Daubenton's Bat (Myotis daubentoni), Nattererer's Bat (M. nattereri), Pipistrelle (Pipistrellus pipistrellus), Pine Marten (Martes martes), Badger (Meles meles), the Irish Hare (Lepus timidus hibernicus), Smelt (Osmerus eperlanus) and the Frog (Rana temporaria). Breeding stocks of Carp are found in Kilsheelan Lake. This is one of only two lakes in the country which is known to have supported breeding Carp. Carp require unusually high summer water temperatures to breed in Ireland and the site may therefore support interesting invertebrate populations.

Parts of the site have also been identified as of ornithological importance for a number of Annex I (EU Birds Directive) bird species, including Greenland White-fronted Goose (10), Golden Plover (1490), Whooper Swan (7) and Kingfisher. Figures given in brackets are the average maximum counts from 4 count areas within the site for the three winters between 1994 and 1997. Wintering populations of migratory birds use the site. Flocks are seen in Coolfinn Marsh and also along the reedbeds and saltmarsh areas of the Suir.

Coolfinn supports nationally important numbers of Greylag Geese on a regular basis. Numbers between 600 and 700 are recorded. Other species occurring include Mallard (21), Teal (159), Wigeon (26), Tufted Duck (60), Pintail (4), Pochard (2), Little Grebe (2), Black-tailed Godwit (20), Oystercatcher (16), Lapwing (993), Dunlin (101), Curlew (195), Redshank (28), Greenshank (4) and Green Sandpiper (1). Nationally important numbers of Lapwing (2750) were recorded at Faithlegg in the winter of 1996/97. In Cabragh marshes there is abundant food for surface feeding wildfowl which total at 1,000 or so in winter. Widgeon, Teal and Mallard are numerous and the latter has a large breeding population - with up to 400 in summer. In addition, less frequent species like Shoveler and Pintail occur and there are

records for both Whooper and Bewick's swans. Kingfisher, a species that is listed on Annex I of the EU Birds Directive, occurs along some of the many tributaries throughout the site.

Landuses adjoining the cSAC consist mainly of agricultural activities including grazing, silage production, fertilising and land reclamation. The grassland is intensively managed and the rivers are therefore vulnerable to pollution from run-off of fertilisers and slurry. Arable crops are also grown. Fishing is a main tourist attraction on stretches of the Suir and some of its tributaries and there are a number of Angler Associations, some with a number of beats. Fishing stands and styles have been erected in places. Both commercial and leisure fishing takes place on the rivers. The Aherlow River is a designated Salmonid Water under the EU Freshwater Fish Directive. Other recreational activities such as boating, golfing and walking are also popular. Several industrial developments discharge to the river.

The Lower River Suir contains excellent examples of a number of Annex I habitats, including the priority habitat Alluvial Forest. The site also supports populations of several Annex II animal species and a number of Red Data Book animal species. The presence of two legally protected plants (Flora (Protection) Order, 1999) and the ornithological importance of the river adds further to the ecological interest of this site.