CARLOW
COUNTY COUNCIL
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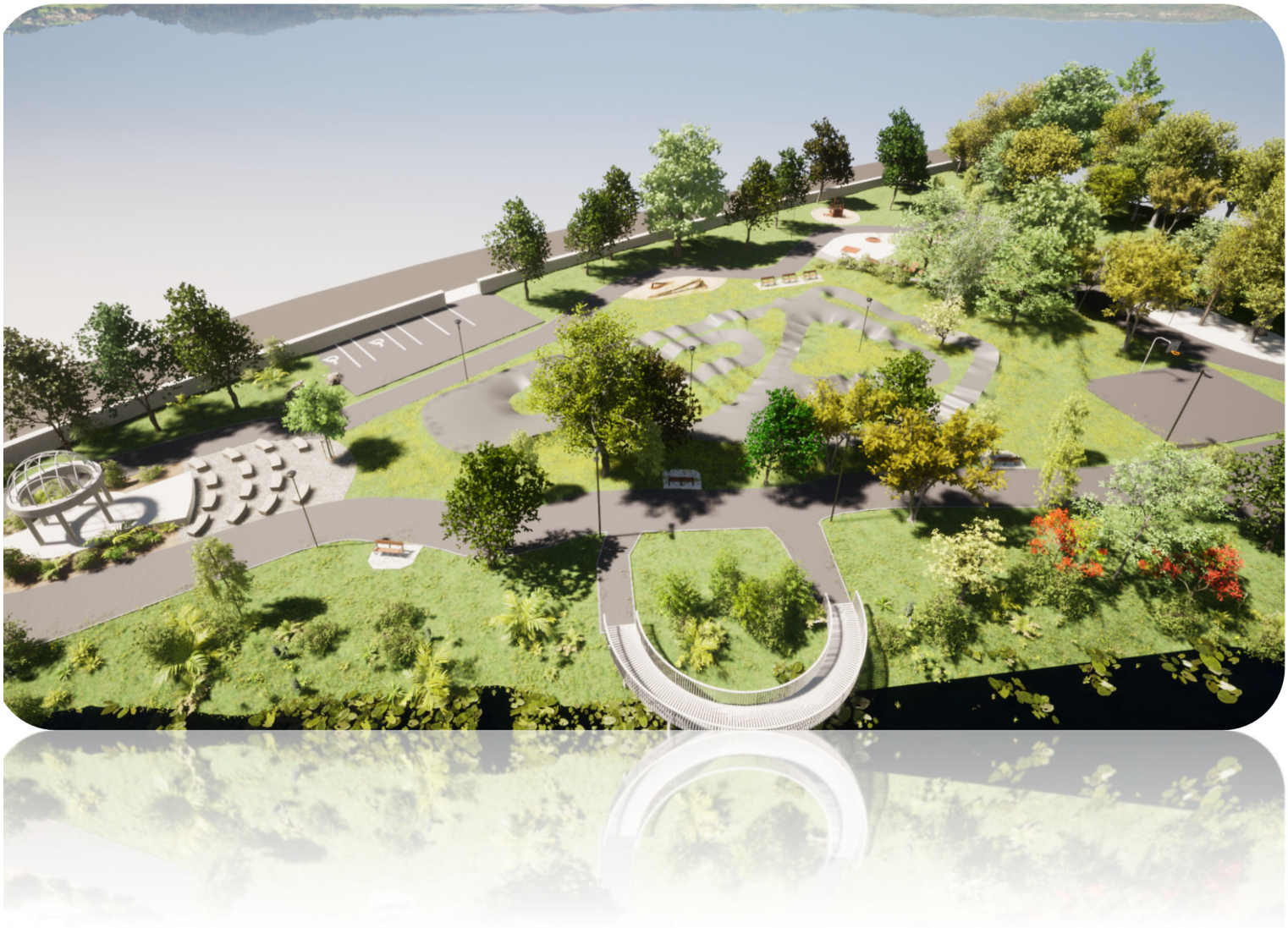


Application for Approval in Accordance with Section 177AE of Planning and Development Act 2000 (as Amended) for Hanover Activity & Bike Park

Prepared by Carlow Municipal District Office

Contents

Introduction & Background

Carlow County Council (CCC) has had a long-term objective of redeveloping Hanover Park creating a major community and recreational asset for Carlow town. The objective of the proposed improvement works for Hanover Park is to enhance the park and provide a wide range of public amenities which will be developed and integrated in a safe, sensitive, sustainable, accessible and positive manner for all ages and abilities

Approval is sought for this redevelopment in accordance with the procedure outlined in Article 249 of the Planning and Development Regulations 2000 (as amended) and Sections 177AE of the Planning and Development Act 2000 (as amended).

The proposed scheme represents an outstanding opportunity to bring about a comprehensive redevelopment of Hanover Park increasing the attractiveness of the town, improving liveability and supporting social and economic vibrancy in the town.

The proposed scheme will promote a Natural Healthy and Active Life through Physical Activities including multi-wheeled activities and a strong emphasis on wildlife preservation, biodiversity enhancement, education, and natural play all within an urban town centre location.

The intention is to bring nature, wildlife, and physical activities close and accessible to persons of all abilities within urban environment while preserving and enhancing the majority of the existing landscaped environment and mature planting.

This multidisciplinary approach should ensure that the development becomes a diverse, attractive, and stimulating amenity for all members of the public.

Project Concept

The vision for this urban redevelopment is the promotion of a Natural Healthy and Active Life through Physical Activities including multi-wheeled activities and a strong emphasis on wildlife preservation, biodiversity enhancement, education, and natural play all within an urban Town Centre location.

The intention is to ensure that the park is a fully inclusive and accessible so that people with physical and cognitive disabilities have an equal opportunity to enjoy the benefits of this outdoor amenity while preserving and enhancing the majority of the existing landscaped environment and mature planting.

This multidisciplinary approach should ensure that the development becomes a diverse, attractive, and stimulating amenity for all members of the public.

It is hoped this redevelopment project will secure the future of the site and demonstrate a strong biodiversity, recreation, and amenity area within a dense urban location.

The proposed redevelopment of Hanover Park to Hanover Activity & Bike Park will be comprised of the following main elements;

- Provision of 3.5m accessible footpaths;
- Provision of an accessible car park for up to four vehicles;
- Provision of an accessible and inclusive playground;
- Provision of a mountain bike pump track,
- Provision of a mini-basketball court,
- Provision of public lighting

All of the proposed amenities and activities are aimed at improving public access, active sport and training, play and recreation for people of all ages and abilities.

Carlow County Council propose to enhance the connectivity, accessibility, use, appearance and biodiversity of Hanover Park in a sensitive and sustainable manner. The objectives for the proposed treatment of the landscape development at the park seek to:-

- Improve universal access and inclusive accessibility to Hanover Park for all ages and abilities,
- Develop and improve the amenity and visitor experience for the people of Carlow and visitors to the town, developing a destination with strong horticultural, and recreational qualities and establishing improved connections to Carlow town and its surround environs,
- Protect, repair, and retain the existing ecological features of the site,
- Form an active place which builds on the strength of existing uses and activities, promotes new, compatible uses and sustainable re-use of spaces,
- Establish an attractive place where open spaces are clean, safe, secure, well maintained and sympathetic to the built & natural heritage.

The proposed development and interventions are illustrated on Drawing Hanover Activity & Bike Park – Proposed Layout (see Appendix A)

Site Location

Hanover Park is situated in Carlow Town adjacent to the Regional Road - R448 (old N9 Carlow to Dublin Road), which before the construction of the M9 motorway was the National Primary route through Carlow Town, and the banks of the River Burren which flows from Mount Leinster in the South East of County Carlow and joins the River Barrow adjacent to the historic Carlow Castle. The park is also bounded by a large car park adjoining a large retail development on its western boundary.

Hanover Park is owned by Carlow County Council and is located in the heart of Carlow Town, just south of the town centre.

Site Location Map

Project Justification

Carlow Town is strategically located in the Southeast of Ireland within an hour of Dublin and Waterford via the M9 motorway and rail link. There are also strong linkages with the Greater Dublin Area, the Midlands and West and to Rosslare Port via the N80, National Secondary Road.

The population of the Town is greater than 24,000 which represents over 40% of the population of the County. Carlow Town is an important local and inter-regional education centre with two Institutes of Higher Education (IT Carlow and Carlow College), six Second Level and Eight Primary Schools. There is a diverse range of industrial, commercial and retail activity in the Town which generates significant economic and employment activity.

In recent years following the economic downturn there was significant development on the periphery of Carlow town. As a result, the town centre was left with vacant or derelict sites and very little private sector development. The town centre lacks a definitive anchor or identity.

The redevelopment of Hanover Park seeks to address this by providing a fully accessible multi activity facility within the town centre, along the banks of the Burren. We believe that Hanover Activity & Bike Park will stimulate economic growth in response to a greater influx of people, users, locals and tourists alike.

Carlow County Council manage three other park amenities in Carlow Town known as Carlow Town Park, Oak Park Forest Park and Shaw Park. These parks also provide open spaces, trails and walks for the people of Carlow Town and the surrounding area to enjoy.

Various bodies have provided letters of support for Hanover Activity & Bike Park (see Appendix H).

Description of the Proposed Development

As outlined above, the aim of the proposed redevelopment works for Hanover Park is to enhance the park and provide a wide range of public amenities which will be developed and integrated in a safe, sensitive, sustainable, accessible and positive manner for all ages and abilities.

In summary, the proposed improvement works include;

Footpaths & Circulation

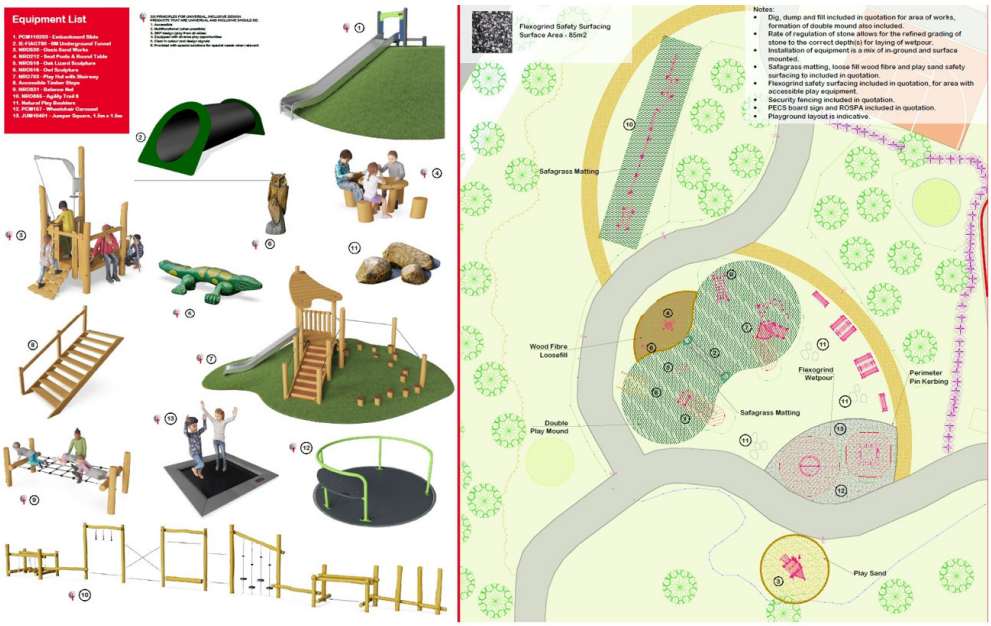
Construction of a new 3.5m wide macadam footpath at a total length of c.200m as part of circulation and access network improvements. This footpath will link to the accessible footpaths which were installed part of the upgrading works completed in 2021. The 3.5m wide footpaths will provide the opportunity of accessible cycling within Hanover Park.

Youth trails will be painted up with miniature road markings on sections of the footpaths to teach children how to cycle in a safe road environment.

Accessible & Inclusive Playground

The main playground which will form part of the Hanover Activity & Bike Park will be an accessible & inclusive playground which makes interactive, friendly play more likely and enriches people and communities with an appreciation of diversity and inclusion.

An obstacle course will be installed opposite the main playground which will provide something different to the traditional playground. There are so many ways children benefit from running an obstacle course. From enhancing muscle strength and motor skills to improving memory and decision-making, obstacle courses can make a positive and lasting impact in children of all ages.



Proposed Playground Layout with Typical Play Area Equipment

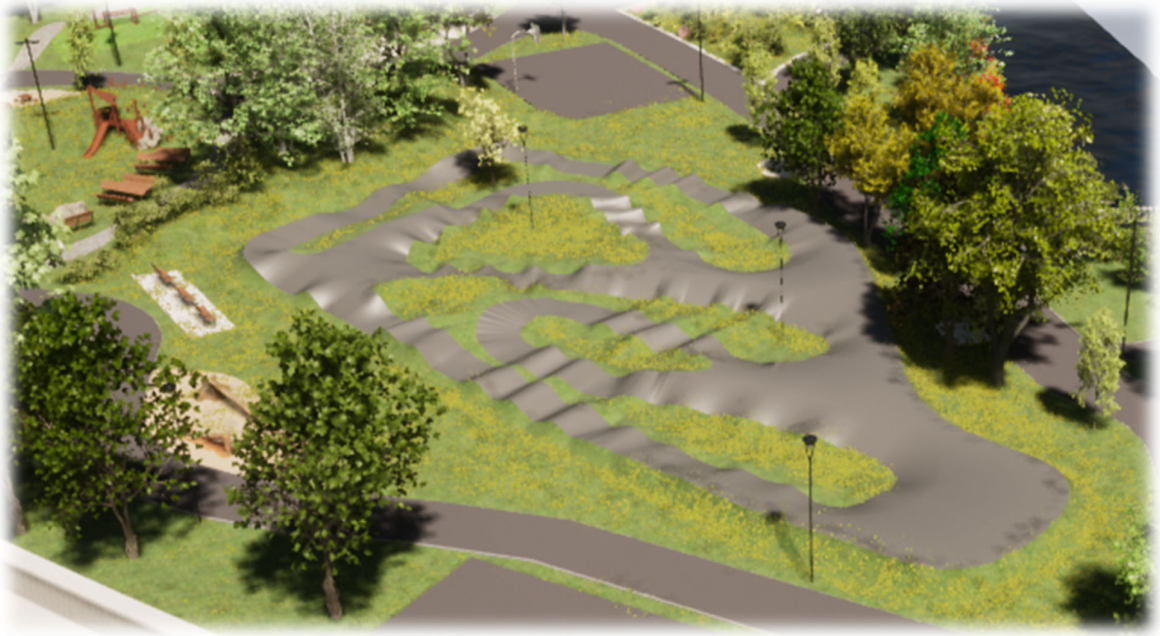
Mountain Bike Pump Track

A pump track is a circuit of rolling mounds, banked turns and features designed to be ridden completely by riders "pumping" – generating momentum by up body movement rather than pedalling. Providing a fun, active experience for all age groups using a bike, roller skates, skate board, or any other non-motorized wheeled vehicle including wheelchairs.

This proposed pump track will consist of a 2m wide bitumen macadam trail with raised (0.5-1.2m high) 'rolling' course with grass mounds.

The explosion in Irish mountain biking is recognised by government through their investment of €13.6 million in mountain bike trail development. Pump tracks have proved to be popular and successful attractions in other parts of the country.

This bike pump track has the potential to transform Carlow. It is a tourist attraction, local amenity, and provides youth engagement.



3D Image of Bike Pump Track in Hanover Activity & Bike Park

Example of rolling course with macadam finish

Proposed wildlife theme for our park and pump track with native plants/trees and low level ground washing bird and bat friendly lighting switched off/dimmed on a timer late at night

Mini-Basketball Court

The accessible mini- basketball court will increase opportunities for people to play more sport in a safe environment with the public outdoor court offering a great training location for local basketball enthusiasts.

Car Park

An accessible car park for up to four vehicles is proposed to allow persons of all abilities to utilise the amenities within the park. The surface water from the car park will be managed using a nature based solution.

The entrance/exit for the car park is at existing/older entrance onto Kilkenny Road/R448 which is within the urban speed limit of the town and will be designed and constructed in accordance with the Design Manual for Urban Roads and Streets (DMURS).

Lighting

12No. new lighting columns (6m in height) will provide illumination along the new accessible footpath, at the pump-track and at the play area. Further details of the proposed lighting scheme are included in Appendix F: Enerveo's Outdoor Lighting Report (2022) for Hanover Park, and Environmental Impact of Lighting Scheme upon Bats: Hanover Park, Carlow Town (Molloy, 2022). (See Appendix A – Public Lighting Layout)

Planting & Biodiversity

A number of important beneficial changes are proposed for Hanover Activity & Bike Park, which will modernise the park and make it more responsive to the needs of people in Carlow and the surrounding area, whilst respecting its existing value as an amenity and green infrastructure asset.

As part of the proposed development, the landscape treatment will comprise:

- Hanover Activity & Bike Park will provide a dynamic and flexible arrangement of open spaces for a range of uses and activities. The proposed planting will provide a spatial structure for the park with the introduction of new native trees including. The new native tree planting will be arranged along proposed footpaths;
- Maintain a 10m wildlife buffer zone adjacent to the River Burren;
- Create a biodiversity garden in the North West corner with trail;
- Enhanced woodland areas along existing tree lines;
- Provision of educational information sign boards at various stop off locations (e.g. Bat & Bird info sign board, Fish & Otter info sign board, Bee and Pollinator info sign board etc);
- Retention and protection of existing mature trees & riparian vegetation;
- Grassland management to develop short and long meadow areas following All-Ireland Pollinator guidelines to promote biodiversity, enhance the landscape value of the Town Park and Riverwalk and the connection between the natural and built environment.

Design Process

Hanover Activity & Bike Park has been developed by a multidisciplinary Team consisting of the following:

- Carlow Municipal District Office;
- Carlow County Council Environment Section;
- Carlow County Council Active Travel Section;
- Ecological and Environmental input from Lisa Dowling, Ecological Consultant;
- Environmental input from Panther Environmental Solutions Ltd;
- Public Lighting input from Molly Consulting Engineers;
- Carlow County Council Planning Section

Planning & Development

This section sets out a review of the relevant existing and forthcoming policy provisions in relation to the proposed Hanover Activity and Bike Park. Three development plans have been considered in this regard:

- the Draft Carlow County Development Plan 2022-2028;
- the Carlow County Development Plan 2015-2021; and,
- the Joint Spatial Plan for the Greater Carlow Graiguecullen Urban Area 2012-2018, incorporating the Carlow Town Development Plan 2012-2018 (as extended).

Following a review of the relevant policy provisions in these three plans, as set out hereunder, it can be concluded that the proposed development, subject to the implementation of relevant environmental considerations, would be in accordance with the proper planning and sustainable development of the area. The proposed development would contribute to fulfilling policies and objectives that seek to protect, improve, and provide for community, recreation, and amenity facilities.

Draft Carlow County Development Plan 2023-2028

Chapter 8: Community Development
It is the policy of the Council to:

Young People

- ***YP. P2**: Consider the needs of children and young people, including those with disabilities and additional needs, in the provision of indoor and outdoor play and recreational facilities.*

Community Facilities

- ***CF. P1:** Assist in the provision of community facilities by reserving suitably located land, through the provision of finance for their development (where available and appropriate), and/or by the use of the development management process to ensure provision is made for such facilities as considered appropriate*
- ***CF. P4:** Encourage the siting of community facilities in suitable locations, especially within residential, town and village centre areas, or close to existing facilities/services and public transport routes.*
- ***CF. P6:** Promote the highest levels of universal access and design in all community facilities.*

Chapter 9: Landscape and Green Infrastructure
In relation to green infrastructure in urban areas it is the policy of the Council to:

- ***GI. P11:** Ensure that green infrastructure informs the development management process, and that all new developments in urban areas contribute towards the protection, maintenance, and enhancement of existing green infrastructure in terms of siting, layout, design, and landscaping.*
- ***GI. P12:** Encourage and support the incorporation of elements of green infrastructure and biodiversity into all new developments in urban areas, including the design of buildings and their surroundings (e.g. tree planting, green spaces and verges, planters, green roofs, living walls, bird boxes, bat roost sites etc.), and that contributes to and links with the wider green infrastructure network, in particular where similar features exist on adjoining sites.*

Chapter 11: Tourism & Recreation

The proposed layout identifies a performance stage and number of living arts features. It is the policy of the Council to:

- ***CA. P1:*** *Promote and support the role and continued expression of local culture, arts and entertainment in the County, and to facilitate and where appropriate to encourage the use of public spaces in towns and villages for art events and performances.*
- ***CA. P4:*** *Encourage and support the creation and display of works of art in public areas, including appropriate locations within the streetscape, provided no unacceptable environmental, amenity, traffic or other problems are created.*

In relation to recreation it is the policy of the Council to:

- ***R. P1:*** *Promote the value of the County's outdoor recreational and amenity resources as key assets for the local economy and for the health and well-being of communities and continue to support the expansion of existing amenities.*
- ***R. P2:*** *Co-operate with relevant agencies and bodies, local development organisations, community groups, and other key stakeholders, in the development of recreational facilities throughout the County.*
- ***R. P4:*** *Develop, in conjunction with local communities, short walking routes, such as looped walks…*
- ***R. P6:*** *Promote the expansion of cycling facilities throughout the County…*
- ***R. P7:*** *Support the maintenance of existing off-road walking and cycling trails and the development of new such trails in the County and ensure that the development of new trails does not negatively impact on any European or nationally protected sites.*

It is an objective of the Council to:

- ***R. O1:*** *Support the implementation of County Carlow's Outdoor Recreation Strategy 2020-2023 and the Healthy Carlow County Plan 2018-2021, and any updated versions of these documents, as a means of promoting the development of outdoor recreational facilities and infrastructure in the County and increasing access to and participation in recreation and physical activity.*

In relation to Objective R. O1 above the *County Carlow Outdoor Recreation Strategy* recognises the central value of urban parklands and outdoor play areas in outdoor recreation, in addition to the opportunity to develop additional trails in the county such as innovative trail development like pump tracks. The Strategy further recognises urban parks and play areas as *'Cornerstone Outdoor Recreation Assets'*.

It is the policy of the Council for open space to:

- ***OS. P2:*** *Develop public open spaces that have good connectivity and are accessible by safe, secure walking and cycling routes, and seek to develop and improve physical linkages and connections between networks of open spaces.*
- ***OS. P5:*** *Increase the use and potential of existing public open space, parks and recreational areas, both passive and active, by integrating existing facilities with proposals for new development and by seeking to upgrade existing facilities where appropriate.*

It is an objective of the Council for open space to:

- ***OS. O3:*** *Increase the use and potential of existing public open space, parks and recreational areas, both passive and active, by integrating existing facilities with proposals for new development and by seeking to upgrade existing facilities where appropriate.*

Section 11.15.1 states that:

- *"Plays areas for children and teenagers contribute significantly to enhancing quality of life and sense of community. The Council recognises the need to maximise opportunities for play areas and facilities and will support their provision in a variety of land use zoning categories where appropriate".*

For play areas, it is the policy of the Council to:

- ***PA. P1:*** *Support local communities in the provision of a range of play facilities, playgrounds, skate parks and other play areas in appropriate locations across the County.*
- ***PA. P2:*** *Provide play facilities adjacent to community and childcare facilities, in so far as is possible, and to ensure their proper management and maintenance.*

For sports and leisure facilities, it is the policy of the Council to:

- ***SL. P1:*** *Facilitate a vibrant and active sports sector in the County with increased participation levels, good quality sustainable facilities, which are appropriate in scale and location and which provide opportunities for people to have access to play an active role in sport and physical activities.*
- ***SL. P2:*** *Support national sport policies and objectives, including collaboration with Sports Ireland, the County Carlow Local Sports Partnerships, clubs, communities and partnerships within and beyond sport, to increase sport and physical activity participation levels.*
- ***SL. P5:*** *Promote town and village centre sites for sports and leisure facilities…*

<u>Chapter 15: Town and Village Plans</u>

The Draft Carlow Town Land Use Zoning Map is included in Section 15.1. The site is zoned 'Open Space and Amenity'. The objective of this land use zoning, as outlined in Chapter 16 (Development Management Standards), is "*To protect, provide for and enhance open space, amenity facilities, and recreational uses".* The aim of the land use zoning objective include:

- *to protect, improve and provide for recreation, open space, and amenity provision;*
- *to protect, improve and maintain public open space; and,*
- *to provide recreational and community facilities.*

Uses permitted in principle in the 'Open Space and Amenity' land use zoning include park/playground, walkway/cycleway trails, and recreational open space and amenity.

Carlow County Development Plan 2015-2021

Chapter 7: Social Inclusion & Community Facilities
It is the policy of the Council under Section 7.1 dealing with community facilities to:

- ***S.I. – Policy 2****: Endeavour to ensure that all play facilities are inclusive and accessible to relevant age groups*

Section 7.2.1 addresses the delivery of community facilities and it is the policy of the Council under same to:

- ***S.I. – Policy 8****: Assist as far as possible in the provision of community facilities by reserving suitably located land, by assisting in the provision of finance for their development (where appropriate), and/or by the use of the development management process to ensure provision is made for such facilities as the Council considers appropriate*

The proposed layout identifies a performance stage and number of living arts features. Section 7.2.8 addresses arts and cultural facilities, under which it is the policy of the Council to:

S.I. – Policy 15:

- *Continue to enhance the public domain by encouraging the provision of public art, both temporary and permanent, across all art forms and artistic disciplines, in towns, villages and new residential developments through the government-supported Per Cent For Art scheme*
- *Encourage and support the creation and display of works of art in public areas, including appropriate locations within the streetscape, provided no unacceptable environmental, amenity, traffic or other problems are created*

Chapter 8: Tourism Recreation and Amenity
Section 8.10 recognises that recreational facilities and open spaces perform a wide range of roles in enhancing the quality of life of towns. It is the policy of the Council under Section 8.10 in the Plan entitled 'Recreational Facilities and Open Space' to:

Rec. Policy 1*: Use its powers under the Planning & Development Acts to ensure that adequate recreational open space and facilities are provided for all groups of the population at a convenient distance from their homes and places of work*

Section 8.10.1 recognises that parks are not only important as a recreational resource but also provide valuable green areas for wildlife corridors and habitats, act as buffers between conflicting land uses, enhance visual amenity and contribute to the health and quality of life of citizens.

It is stated under **Objective 1** in Section 8.10.2 of the Plan that Carlow County Council, with the assistance of the Local Community Development Committees (LCDCs), Local County Development Board and the Local Sports Partnership, will seek to:

- *Enhance planning of sport and recreation at local level through the Local Area Sports Partnership.*
- *Increase levels of local participation and promote the development of opportunities for all groups to become involved in sports and amenity. This is particularly relevant in the case of disadvantaged groups and specific target groups such as older people, girls and women, people with disabilities, unemployed people and those who live in disadvantaged communities or areas lacking amenity infrastructure.*

- *Promote Carlow as a healthy area.*
- *Improve access to all sectors of the population, especially the socially disadvantaged to a range of sport, recreation and leisure facilities.*
- *Encourage where appropriate better use of existing facilities and assist in the provision of new facilities.*

It is the policy of the Council under Section 8.11.4 to provide, maintain and manage children's play areas where it is appropriate as finance and resources permit, and:

***Rec. – Policy 2**:*

- *Support the National Play Policy "Ready, Steady, Play". The policy advocates a child centered approach to the development of play facilities.*
- *Create a child-friendly and safe environment where the importance of play is recognised for a child's development*
- *Improve the quality and safety of playgrounds and play areas*
- *Undertake a mapping exercise that identifies existing play services, facilities and amenities as well as highlights gaps in these areas across the county*

Section 8.11.8 deals with riverside development, and it is the policy of the Council under this section of the plan (Rec. – Policy 4) to *"Protect and improve the natural amenity potential and accessibility of the…River Burren subject to appropriate environmental assessments…".*

Joint Spatial Plan for the Greater Carlow Graiguecullen Urban Area 2012-2018, incorporating the Carlow Town Development Plan 2012-2018 (as extended).

The site is zoned 'Town Centre' in the Plan, the objective of which *"To protect the vitality and vibrancy of the town centre and provide for town centre activities".* The purpose of this zone is to protect and enhance the vitality and vibrancy of the town centre, which includes the provision of public facilities and amenities.

Under the zoning matrix in the plan a 'playground' use, a 'community facility' use, and a 'recreational facility' use, are all permitted in principle uses i.e. A permitted in principle use is identified in the plan as "*A use which will normally be acceptable is one which the Councils accept in principle in the relevant zone. However, it is still subject to the normal planning process including policies and objectives outlined in the Plan".*

Chapter 6 in the Plan entitled 'Recreation, Amenity and Open Space' includes:

- ***Core Aim 6:** To provide and enable the provision of a range of well-maintained and managed open spaces, sporting facilities and recreational facilities accessible to all, convenient to the town centre, people's homes and workplaces, catering to the needs and interests of different groups in the Greater Carlow Graiguecullen Urban Area and in support of good public health*

- ***Objective REC O02** Ensure that where practicable, community, recreational and open space facilities are grouped or clustered to maximise usage and benefit from shared facilities such as car-parking and changing rooms and ensure such facilities are in accessible locations.*

- ***Objective REC O04*** *Liaise with community groups, interest groups, commercial organisations and partnerships and support initiatives to improve or provide additional recreational and sporting facilities or amenities, subject to resources*

- ***Sports Policy REC P01*** *Coordinate with the County Carlow Sports Partnership and support the development of sport in the Greater Carlow Graiguecullen Urban Area based in identified need and aimed at increasing opportunities for participation in sport and physical activity by all.*

- ***Sports Policy REC P04*** *Promote the provision, maintenance and management of high quality indoor and outdoor sporting facilities which are accessible to all members of the community*

- ***Sport Policy REC P05*** *Facilitate the development of specialized sports facilities catering to the needs and interests of different groups within the Greater Carlow Graiguecullen Urban Area*

- ***Sports Policy REC P06*** *Ensure sporting facilities are located in suitable areas and designed to ensure easy access and reduce traffic generation*
- ***REC P10*** *Support the maintenance of the playground at the Town Park, the upgrading of the playground at Hanover Park and the provision of similar playground areas in association with public open spaces or existing sports facilities*

- ***REC P12*** *Endeavour to provide a hierarchy of parks, open spaces and outdoor recreation areas within the Greater Carlow Graiguecullen Urban Area so that the population can participate in a wide range of active and passive recreational pursuits within easy reach of the town centre, their homes or places of work*

- ***REC P13*** *Improve the quality and quantity of public open spaces within the Greater Carlow Graiguecullen Urban Area and provide for compatible uses within these areas such as cycle-routes, playgrounds and outdoor gyms*

- ***REC P14*** *Improve walking and cycling linkages between and within areas of open space to increase their accessibility*

On page 113 of the Plan under the section entitled 'Amenity Space and Development' it is stated that:

> *Public open space is considered of particular importance in relation to family dwelling units to provide opportunities for play and socialisation. Specific active play areas for children can be provided as part of residential developments for small sites as well as large expansive sites. These play areas may include fixed equipment such as rockers, cradle swings, carousels, balance beams, climbing frames providing a child with an opportunity for challenging, stimulating and social play. Teenagers also benefit from specialised recreational facilities such as skate parks or informal space for peers to gather as well as more formalised sporting facilities.*

Section 7 of the Plan entitled 'Sustainable Communities and Social Inclusion' includes the following policies:

- ***Community Facilities Policy SOC P08*** *Work with other statutory agencies and community groups to enable the optimum usage of existing community facilities, the enhancement of existing community facilities and the provision of additional community facilities*

- ***Community Facilities SOC P09*** *Ensure community facilities are located in areas where they can be easily accessed*

- ***Community Facilities SOC P13*** *Seek to address persistent deficiencies in community facilities in established residential areas, in particular focusing on disadvantaged areas*

- ***Community Facilities SOC P14*** *Provide for the particular and diverse needs of specific groups in society, in particular the establishment of specialised community facilities including indoor facilities for teenagers, the elderly, minority faith groups and immigrant communities*

Effects on the Environment

The specific effects in terms of the likely environmental effects of the proposed park redevelopment are dealt with in the next section; the likely effects on the environment in general during both construction and operational phases are addressed here. These include Environmental factors such as Cultural Heritage, Biodiversity, Air, Climate and Noise etc.

Impacts are identified and evaluated in terms of depth of effect. Potential impacts identified are minor, localised impacts occurring for a short duration over the construction phase of the project. Mitigation measures are proposed to address impacts where required.

This section should be read in conjunction with Appendices A to G:

Receptor	**Environmental Effect**
Human Beings	Short-term increase in localised noise, dust and disruption during construction phase of project. No cumulative/long term significant risk.
Architectural Heritage/Cultural Heritage	No possible impact
Air, Noise	Short-term increase in localised noise, dust and disruption during construction phase of project. No cumulative/long term significant risk
Flora, Fauna	No significant risk
Water	No significant risk impact on the hydrological regime of the area/flooding Potential for short term impact on water quality of river during construction phase. Mitigation measures outlined in relevant appendices
Urban Life	Short-term increase in localised traffic, noise, dust and disruption during construction phase of project. Short term impact of construction site on townscape. Mitigation measures outlined in relevant appendices.

Impact on other Designations

The proposed development is not located in a Natural Heritage Area, Proposed Natural Heritage Area or Special Protection Area.

The proposed development is located directly south of the River Burren. The River Burrin is a tributary of the River Barrow and connects the project hydraulically with the River Barrow & River Nore SAC. See: Appendix C: Natura Impact Statement, Hanover Activity & Bike Park, 2022 (Lisa Dowling, Ecological Consultant.) in terms of the likely significant effects on the SAC.

Construction Phases and Impacts

A full description of the proposed Hanover Activity & Bike Park can be found in preceding sections.

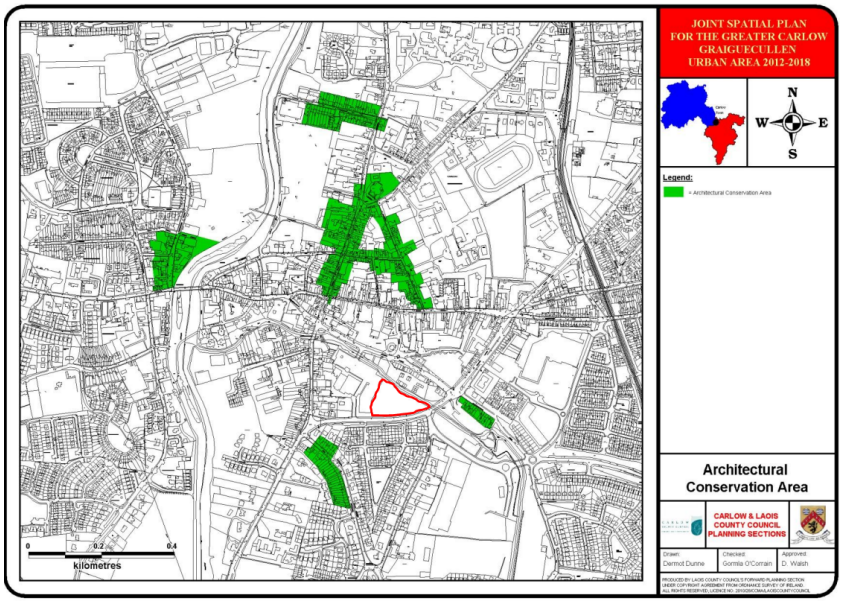
Please see Appendix E: Construction Environmental Management Plan (CEMP) of Hanover Bike & Activity Park prepared by Carlow Municipal District Office for further details on the construction and operational phases and impacts, likely emissions and/or discharges, phasing, and any mitigation measures proposed.

The CEMP communicates the key environmental obligations that apply to all site personnel, sub-contractors and visitors to the site, while carrying out construction activities as part of the proposed development. The CEMP defines the approach to environmental management at the proposed development site, outlining the work practices, construction procedures and responsibilities to be undertaken during the construction phase. Compliance with the CEMP, the procedures, work practices and controls would be mandatory and must be adhered to by all personnel and sub-contractors employed during the construction phase. The CEMP outlines, where necessary, the control measures that are required to avoid, minimise or mitigate potential effects on the environment and surrounding area.

Architectural Heritage Impact Assessment

The proposed site (Site A and B) contains no existing buildings, archaeological sites or ancient monuments. There are no protected structures on the site.

Hanover Park is not located within a Zone of Archaeological Potential (ZAP), (See Architectural Conservation Areas (excerpt from Joint Spatial Plan) below. There are no National Monuments located within the proposed site.



Architectural Conservation Areas (excerpt from Joint Spatial Plan)

Air, Odour and Noise emission Assessment

- Please see: Appendix E: Construction Environmental Management Plan (CEMP) of Hanover Bike & Activity Park (Carlow Municipal District Office)

For specific assessment of water quality, surface & groundwater impacts, air and noise impacts during Construction.

- Please see: Appendix A: Natura Impact Statement, Hanover Activity & Bike Park, 2022 (Lisa Dowling, Ecological Consultant)

For assessment of water quality, surface & groundwater impacts and noise impacts as related to the SAC.

- Please see: Appendix D: Noise Impact Assessment, Hanover Activity & Bike Park, 2022 (Panther Environmental Solutions Ltd)

It is evaluated that considering proposed mitigation measures, there is anticipated to be no significant noise impact as a result of the proposed development during the construction or operational phases.

Ecology/Biodiversity

- Please see: Appendix E: Construction Environmental Management Plan (CEMP) of Hanover Activity & Bike Park (l Solutions Ltd.)

For assessment of flora and fauna, soils, water, invasive species, local biodiversity during Construction, and associated management and mitigation plans.

- Please see: Appendix A: Natura Impact Statement, Hanover Activity & Bike Park, 2022 (Lisa Dowling, Ecological Consultant) & Appendix B: Ecological Assessment Report, 2022 (Lisa Dowling, Ecological Consultant)

For specific assessment of flora and fauna, soils, water, invasive species, local biodiversity as related to the SAC specifically; and associated management and mitigation plans.

Lighting

- Please see: Appendix F: Enervro Lighting Report & Environmental Impact Lighting Upon Bats (Molloy Consulting Engineers)

For specific assessment of the provision of new public lighting within the proposed Hanover Activity & Bike Park.

Flood Risk Assessment

- Please see Appendix C: Flood Risk Assessment, 2021 (Carlow County Council, Environmental Section)

For detailed Flood Risk assessment of site and development.

Traffic Impact Assessment

Given the scale of the proposed development and the fact that it is a redevelopment of an existing public space that is well served by the existing road network, it is considered that the level of increase in road traffic during the operational phase of the development would be negligible. As such, the existing road network is deemed to have sufficient capacity to safely serve the proposed development.

The existing cyclist & pedestrian facilities adjacent to the proposed Hanover Activity & Bike Park have been upgraded through the National Transport Authority, Active Travel programme which will cater for the existing and future cycling & pedestrian demand as a result of the redevelopment.

Environmental issues: The likely significant effects upon a European site

The likely significant effects of the proposed development upon the River Barrow and River Nore SAC is assessed in Natura Impact Statement (NIS); please see the scientific examination of evidence and data outlined in Appendix A: Natura Impact Statement, Hanover Activity & Bike Park, 2022 prepared by Lisa Dowling, Ecological Consultant.

It is considered that following mitigation, the proposed project does not have the potential to significantly affect the conservation objectives of this Natura 2000 site and the integrity of this site will not be adversely impacted. No residual effects will occur on the Natura 2000 network.

Appendix A and Attached Separately – Plans, Particulars & Images

Aerial Photograph - North

Aerial Photograph – South

Site Notice - Photograph

Existing Carlow Town Parks Drawing

Appendix B – Natura Impact Statement

Carlow Municipal District

Hanover Activity & Bike Park,

Hanover, Carlow

NATURA IMPACT STATEMENT

Version 3.0

7th April 2022

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1 INTRODUCTION

1.1 Background

Lisa Dowling MCIEEM was commissioned by Carlow Municipal District to prepare a Natura Impact Statement (NIS) for Hanover Activity and Bike Park at Hanover in Carlow town centre (See Figure 1). The assessment will be conducted in accordance with Schedule 6(3) of the Habitats Directive 92/43/EEC (Assessment of Plans and projects significantly affecting Natura 2000 Sites).

An Ecological Impact Assessment (EcIA) has been prepared to identify important ecological features within the zone of influence of the project and to identify potential ecological impacts of the development. The NIS specifically focuses on assessing potential impacts of the development on the nearby River Barrow and River Nore Special Area of Conservation (SAC). In order to reduce repetition, reference is made to the EcIA where necessary.

Part 1 in Schedule 5 of the *Planning and Development Regulations 2001* (as amended) defines mandatory projects that require an Environmental Impact Assessment Report (EIAR), and Part 2 of the same schedule defines projects that are assessed on the basis of set mandatory thresholds for each of the project classes. The proposed development does not come within the scope of any of the mandatory projects that require mandatory EIAR in Part 1 or Part 2 of Schedule 5.

Having regard to the nature and scale of the proposed development it is considered that there is no real likelihood of significant effects on the environment arising from the proposed development. The need for EIA can therefore be excluded at preliminary examination, and for this reason an EIA screening determination is not required.

<u>Statement of Authority</u>

Lisa Dowling has over sixteen years environmental consultancy experience, specialising in the areas of Ecological Impact Assessment and Appropriate Assessment. She obtained an honours degree in Applied Ecology in 1995 from University College Cork; a masters degree in Environmental Resource Management in 1997 from University College Dublin; and a post-experience Certificate in Biological Recording and Species Identification from University of Birmingham in 2005. She is a full member of the professional body, the Chartered Institute of Ecology and Environmental Management (CIEEM) since 2006 and is nominated vice-county recorder of the Botanical Society of Britain and Ireland (BSBI) for County Carlow. She holds full professional indemnity insurance.

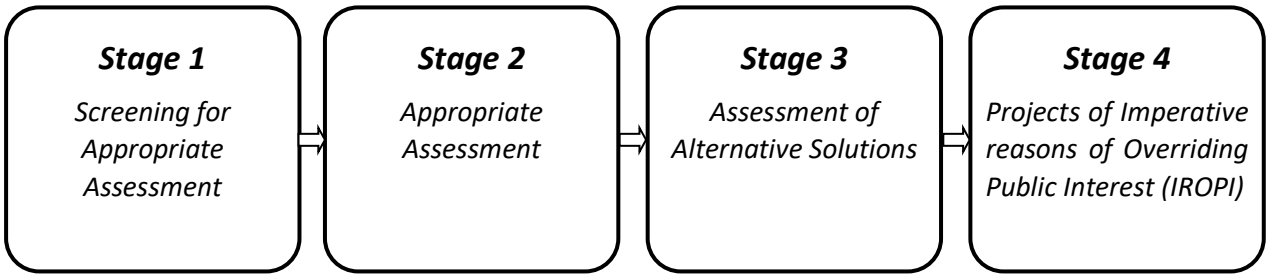
1.2 Legislative Context

The Habitats Directive (*Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora*) provides legal protection for habitats and species of European importance. The main aim of this Directive is to promote biodiversity by the conservation of natural habitats and wild fauna and flora within the European Union. Under this Directive, Special Areas of Conservation (SACs) have been selected as important examples of habitat types listed in Annex I, and the habitats of certain species listed in Annex II of the Habitats Directive. SACs together with Special Protection Areas (SPAs) make up a network of European sites called the Natura 2000 network. SPAs are designated under the *Council Directive 79/409/EEC on the Conservation of Wild Birds*, commonly known as the “Birds Directive”.

Figure 1. Proposed Site

Appropriate Assessment is required under the Habitats Directive for any plan or project likely to have a significant effect on a Natura 2000 site. Articles 6(3) and 6(4) of the Habitats Directive lay down a four-step procedure to be followed with respect to proposed plans or projects that may impact on Natura 2000 sites. This procedure is summarised in the flowchart below.

For the purposes of this document, we are only concerned with the first and second stages: Stage 1 Screening and Stage 2 Appropriate Assessment. Appropriate Assessment procedure has been clarified in recent years by the ruling from CJEU (C-323/17) which held that any measures intended to avoid or reduce the harmful effects of a project on a site should not be taken into account at screening stage.



2 METHODOLOGY

This Appropriate Assessment has been prepared in accordance with:

- "*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"* (EC, 2001).
- "*Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities*" (DEHLG, 2010).
- "*Appropriate Assessment Screening for Development Management*" (OPR, 2021).
- Rulings of the Justice of the European Union (CJEU) cases relating to Appropriate Assessment, particularly C-323/17 "*People Over Wind, Peter Sweetman v Coillte Teoranta*", C-258/11 "*Peter Sweetman and Others v An Bord Pleanála*" and C-521/12 "*T.C. Briels and Others v Minister van Infrastructuur en Milieu*".

A desktop review was undertaken to identify features of ecological importance, particularly with reference to the qualifying interests of the relevant Natura sites. The following sources of information were reviewed:

- Ordnance Survey mapping and aerial photography.
- Available data and literature on qualifying interests of the relevant Natura sites as held by the National Parks and Wildlife Service (NPWS) database (www.npws.ie), National Biodiversity Data Centre (NBDC) database (www.biodiversityireland.ie) and Inland Fisheries Ireland (IFI).
- Environmental Protection Agency (EPA) water quality data.
- National Association Soil Map for Ireland at a scale of 1:250,000 (Irish Soil Information System Project).
- Consultation with the Development Applications Unit (DAU)/ NPWS.
- Consultation with the IFI.

Site visits were conducted over Winter 2020/Spring 2021 during which the following assessments were undertaken:

- A habitat assessment (10/12/2020; 05/02/21 and 24/04/21) was undertaken within the proposed site, and along its boundaries, in accordance with current guidelines ("*A Guide to Habitats in Ireland*" (Fossitt, 2000) and "*Best Practice Guidance for Habitat Survey and Mapping*" (Smith *et al.*, 2011)).
- An otter survey (05/02/2021) was undertaken from Burren Bridge to Paupish Bridge (680m distance) scanning the banks for signs of otter such as spraints (droppings), prints, food signs, slides, couches and holts to ascertain usage of the watercourse by this qualifying interest.
- The Burren River adjacent to the site was assessed as a potential habitat for water-dependent qualifying interests of the downstream River Barrow and River Nore SAC (24/04/21).

An additional walkover of the site was undertaken on March 1st 2022 in order to update habitat mapping undertaken in 2021.

3 STAGE 1 SCREENING

Appropriate assessment screening was undertaken regarding the proposed development. Screening was conducted in accordance with the OPR Practice Note *Appropriate Assessment Screening for Development* (OPR, 2021) which identifies 4 individual steps as presented below.

Step 1: Description of the project/proposal and local site characteristics:

Brief description of the project or plan:	The development of the existing urban park (c. 0.95ha) which will include a bike pump track, a new playground, mini-basketball court, a small carpark, new biodiversity garden and new footpaths (See Proposed Layout of the Park in Appendix 1 for further details).
Brief description of site characteristics:	The project area encompasses an existing town park adjacent to the former Penney's carpark and the River Burren within Carlow's urban centre. The site has gently undulating topography and is located c. 430m east of the River Barrow.
List of prescribed bodies consulted:	• DAU / NPWS • IFI
Response to Consultation:	A response from the **DAU** was received on 19th March 2021 (See full response in Appendix 3). Their chief concerns are summarized below: • The development has the potential to have a significant effect, either individually or in-combination with other plans and projects on the River Barrow & River Nore SAC. • Hanover Park has very regular Otter sightings, mostly during the hours of darkness at the bridge at the Old Penny's carpark. • The introduction of additional lighting is a concern for otters, bat species and roosting birds. The NPWS suggest putting any lighting on a timer and that lighting should be low level path lighting. • The potential for suspended solids pollution from road run-off from vehicles entering and leaving this site during development should be addressed. • All riparian habitat should be undisturbed, except for the removal of invasive species. A suitable buffer zone should be created. Silt fences should be constructed on the boundary of the buffer zone in order to control suspended solids emissions. • Care should be taken to avoid introduction or spread of invasive species which could impact negatively on these sites. No response received from **IFI** 04/03/2022

STEP 2. Identification of relevant Natura 2000 sites using Source-Pathway-Receptor model and compilation of information, qualifying interests and conservation objectives.				
European Site (Code)	**List of Qualifying Interests**	**Distance from Proposed Development (km)**	**Connections (Source, Pathway, Receptor)**	**Considered further in Screening (Y/N)**
River Barrow and River Nore SAC (002162)	23 Qualifying Interests Including 2 Priority Habitats- Alluvial forests [91E0] and Petrifying springs [7220]; and qualifying species and habitats dependent on high water quality. https://www.npws.ie/protected-sites/sac/002162	430m	The River Burren adjacent to the proposed site is a major tributary of the River Barrow and connects the project hydrologically with the SAC c. 600m downstream. Otter, a qualifying interest of the SAC, frequents the proposed site and adjacent river.	Y
Slaney River Valley SAC (00781)	15 Qualifying Interests Including a Priority Habitat- Alluvial forests [91E0], and species and habitats dependent on high water quality https://www.npws.ie/protected-sites/sac/000781	10.5km	No ecological connection via ground or surface water. No ecological connection via air due to separation distance.	N
Holdenstown Bog SAC (001757)	1 Qualifying Interest, namely Transition Mires [7140] https://www.npws.ie/protected-sites/sac/001757	18km	No ecological connection via ground or surface water. No ecological connection via air due to separation distance.	N
Blackstairs Mountains SAC (000770)	2 Qualifying Interests, namely Wet Heaths [4010] and European dry heaths [4030] https://www.npws.ie/protected-sites/sac/000770	22km	No ecological connection via ground or surface water. No ecological connection via air due to separation distance.	N

STEP 3. Assessment of Likely Significant Effects

(a) Identify all potential impacts that may result in significant effects on the conservation objectives of a European site, taking into account the size and scale of the project under the following headings:

Impacts:	**Significance of Impacts: (duration/magnitude/etc):**
Construction phase e.g. • Vegetation clearance • Demolition • Surface water runoff from soil excavation/infill/ landscaping (including borrow pits) • Dust, noise, vibration • Lighting disturbance • Impact on groundwater/dewatering • Storage of excavated/construction materials • Access to site • Pests	a) Activities such as clearance of vegetation and large-scale removal, grading, levelling of topsoil and subsoils, and stockpiling of soils and other materials within Hanover Park have the potential to produce large amounts of sediment-laden runoff especially during periods of heavy rainfall. If water pollution was to occur during the construction stage, this could result in loss of silt or other pollutants such as raw or uncured concrete and grouts, wash-down water from exposed aggregate surfaces, cast-in-place concrete, fuels and lubricants into the adjacent River Burren which discharges into the River Barrow and River Nore SAC. This would be a temporary impact, but it may be of significance due to the proximity and pathway to the SAC and the sensitivity of several of the aquatic QIs to sedimentation. b) Disturbance impacts on the riparian zone of the River Burren may arise during the development phase by increased human/vehicular activity and noise levels. This would be a temporary impact but given that Hanover Park and the River Burren is used by the qualifying interest Otter for commuting and foraging purposes, this may be a significant effect. c) The introduction and disturbance of scheduled and unscheduled invasive plant species, could, where unmitigated, cause further spread and establishment of such species within the riparian zone of the Burren, having indirect impacts on the SAC downstream by provision of a seed bank of invasive plant species. This would potentially cause long term impacts given the sensitivities of certain bankside qualifying habitats to the spread of invasive plant species.
Operational phase e.g. • Direct emission to air and water • Surface water runoff containing contaminant or sediment • Lighting disturbance • Noise/vibration • Changes to water/groundwater due to drainage or abstraction	a) The introduction of additional lighting may cause light disturbance to Hanover Park in general, and the adjacent Burren riparian zone. Increased human activity may cause noise and visual disturbance to the Burren riparian zone during the operational phase. Such disturbance impacts may be significant given that the qualifying interest Otter frequents Hanover Park, and the River Burren.

STEP 3. Assessment of Likely Significant Effects *(a) Identify all potential impacts that may result in significant effects on the conservation objectives of a European site, taking into account the size and scale of the project under the following headings:*	
• Presence of people, vehicles and activities • Physical presence of structures (eg collision risks) Potential for accidents or incidents	
In-combination/Other	• The proposal is located within an existing park in an urban environment. A number of large projects have been granted permission or are pending permission in the vicinity of the project along the River Burren, namely planning refs. 18/433; 19/478; and 21/114. • In addition, Carlow County Council undertook small-scale upgrade works at the Park during October 2021 which included upgrade of existing footpath, installation of an outdoor classroom (c. 145 m^2), refurbishment of bandstand, upgrade of lighting to LED to improve efficiency and relocation of all lighting columns outside of 10m setback of river. Potential adverse effects of this development were ruled out at Appropriate Assessment Screening. • Development of cycling routes along Kilkenny Road adjacent to Hanover Park under the Active Travel Programme for Carlow Town.
(b) Describe any likely changes to the European site arising as a result of:	
Examples of the type of changes to give consideration to include: • Reduction or fragmentation of habitat area. • Disturbance to QI species • Habitat or species fragmentation • Reduction or fragmentation in species density • Changes in key indicators of conservation status value (water quality etc.) • Changes to areas of sensitivity or threats to QI • Interference with the key relationships that define the structure or ecological	**River Barrow and River Nore SAC** If water pollution was to occur at either construction or operational stages, this could result in sediment or other contaminants to the River Burren which discharges into the River Barrow and River Nore SAC. Such an event has potential to impact significantly upon the water quality of the SAC which could, in turn, affect the conservation objectives of the site having regard to the characteristics and sensitivities of the water-dependent qualifying interests, such as Salmon, Sea lamprey, River lamprey, Brook lamprey and Crayfish, to changes in water quality and levels of sedimentation. Increased lighting, noise and human disturbance during both development and operational phases could result in indirect effects on the qualifying interest Otter within the River Burren by causing changes in its foraging, breeding or resting behaviours. The spread of invasive non-native plant species such as Himalayan balsam within the proposed site could contribute to proliferation of this species along the riparian corridor of the Barrow further downstream, thereby potentially reducing the species composition and habitat quality of certain bankside qualifying habitats such as

STEP 3. Assessment of Likely Significant Effects

(a) Identify all potential impacts that may result in significant effects on the conservation objectives of a European site, taking into account the size and scale of the project under the following headings:

function of the site	Alluvial woodland and Hydrophilous tall-herb swamp.
• Climate change	

Step 4. Screening Determination Statement:

The assessment of significance of effects:

Describe how the proposed development (alone or in-combination) is/is not likely to have significant effects on European site(s) in view of its conservation objectives.

Based on available information, and having regard to:

- the proposed site which is situated adjacent to the River Burren which provides a direct hydrological connection of c. 600m with the River Barrow and River Nore SAC (002162),
- the size and scale of the project,
- the potential for silt-contaminated runoff or other contaminants entering the River Burren during the construction phase, with resultant impacts on water quality and potentially adverse effects on downstream water-dependent qualifying interests,
- the presence of scheduled and unscheduled invasive plant species on the proposed site which could contribute to proliferation of such species downstream within the Barrow SAC,
- increased levels of light and disturbance during development and operational phases and their potential effects on the qualifying interest Otter and
- the potential for in-combination effects with other granted projects / projects pending permission in the vicinity,

it is concluded that the proposed development, individually or in-combination with other plans or projects, is likely to have a significant effect on the **River Barrow and River Nore SAC**, in view of the site's conservation objectives.

An appropriate assessment is, therefore, required to determine if adverse effects on site integrity can be excluded in view of the conservation objectives of the River Barrow and River Nore SAC.

4 STAGE 2 APPROPRIATE ASSESSMENT

4.1 Project Details and Existing Environment

4.1.1 Details of the Development

The design of this urban park development has a strong emphasis on wildlife, biodiversity and natural play areas, all within an urban town centre location. The project area encompasses an existing town park adjacent to the former Penney's carpark and the River Burren, on a site of c. 0.95ha. The existing habitats, trees, shrubs and topography have been incorporated in the overall design of the project as far as possible. Artificial surfaces will be predominantly permeable in nature offsetting the necessity for formal drainage proposals. The expected construction timeframe would be approximately four months, with hours of operation from 7am to 7pm Monday to Friday.

For further details of the project, see Proposed Layout in Appendix 1. The proposal includes the following elements:

- Playground (c. 515m^2). Construction of the playground will include excavation for the installation of safegrass matting, loose fill wood fibre, flexogrid safety surfacing and play sand safety surfacing as per Playground Plan included in Appendix 2. Two small double mounds will be formed with suitable imported fill material and safegrass matting will be placed on the imported fill material. Play equipment will be as detailed in Playground Plan in Appendix 2.
- Bike pump track (c. 877m^2). Imported fill material will be used to create the rolling hills of the pump track. A layer of crushed stone (Cl 804) will be placed on the imported fill and the crushed stone will then be finished with a layer of macadam. The proposed pump track will have a wildlife theme with native plants / trees and low-level ground washing lighting. This lighting will be switched off on a timer late at night. See pump track examples in Appendix 2.
- Accessible carpark (c. 219m^2) comprising 4 No. car spaces.
- Biodiversity garden (c. 124m^2) including shallow wildlife pond (it is not envisaged that this pond will connect with the River Burren).
- New 3.5m wide accessible footpaths linking the accessible car park to the playground and encircling the biodiversity garden. Works will involve striping of soils to c. 15cm depth, laying terram, followed by 804 crushed aggregate and c. 50/60mm of macadam surface.
- Wildlife buffer zone. This area will encompass 10m setback from the River Burren and will remain undeveloped.
- Mini basketball court (c. 140m^2)
- Cycling skills feature
- Age friendly seating & picnic benches
- 12 No. new lighting columns (6m in height) will provide illumination along the new footpath, at the pump-track and at the play area. Further details of the proposed lighting scheme are included in Enerveo's Outdoor Lighting Report (2022) for Hanover Park, and Environmental Impact of Lighting Scheme upon Bats: Hanover Park, Carlow Town (Molloy, 2022).
- Planting of native trees and plants

All works will be undertaken in accordance with a Construction Environmental Management Plan (CEMP) compiled by Carlow County Council.

4.1.2 Description of Development Site

The proposed site comprises the existing park at Hanover within the urban environment of Carlow town. The site is a triangular shape, with the northern side bordering the River Burren and commercial premises, associated carpark and residential developments situated on the far bank (See Figure 1). The southern site boundary runs along the Kilkenny Road with residential development and Aldi carpark situated on the far side. Three existing entrances are located along this boundary. The western site boundary borders a large carpark formerly occupied by Penney's retail unit. A pedestrian entrance accesses the Park from Penney's carpark.

Full habitat descriptions are included in the accompanying EcIA. In summary, 7 No. habitat types were identified within the proposed site and are presented on Figure 2. They are as follows:

- Improved Amenity Grassland (GA2)
- Scattered Trees and Parkland (WD5)
- Mixed Broadleaved Woodland (WD1)
- Buildings and Artificial Surfaces (BL3)
- Wet Grassland (GS4)
- Treelines (WL2)
- Depositing/Lowland River (FW2)

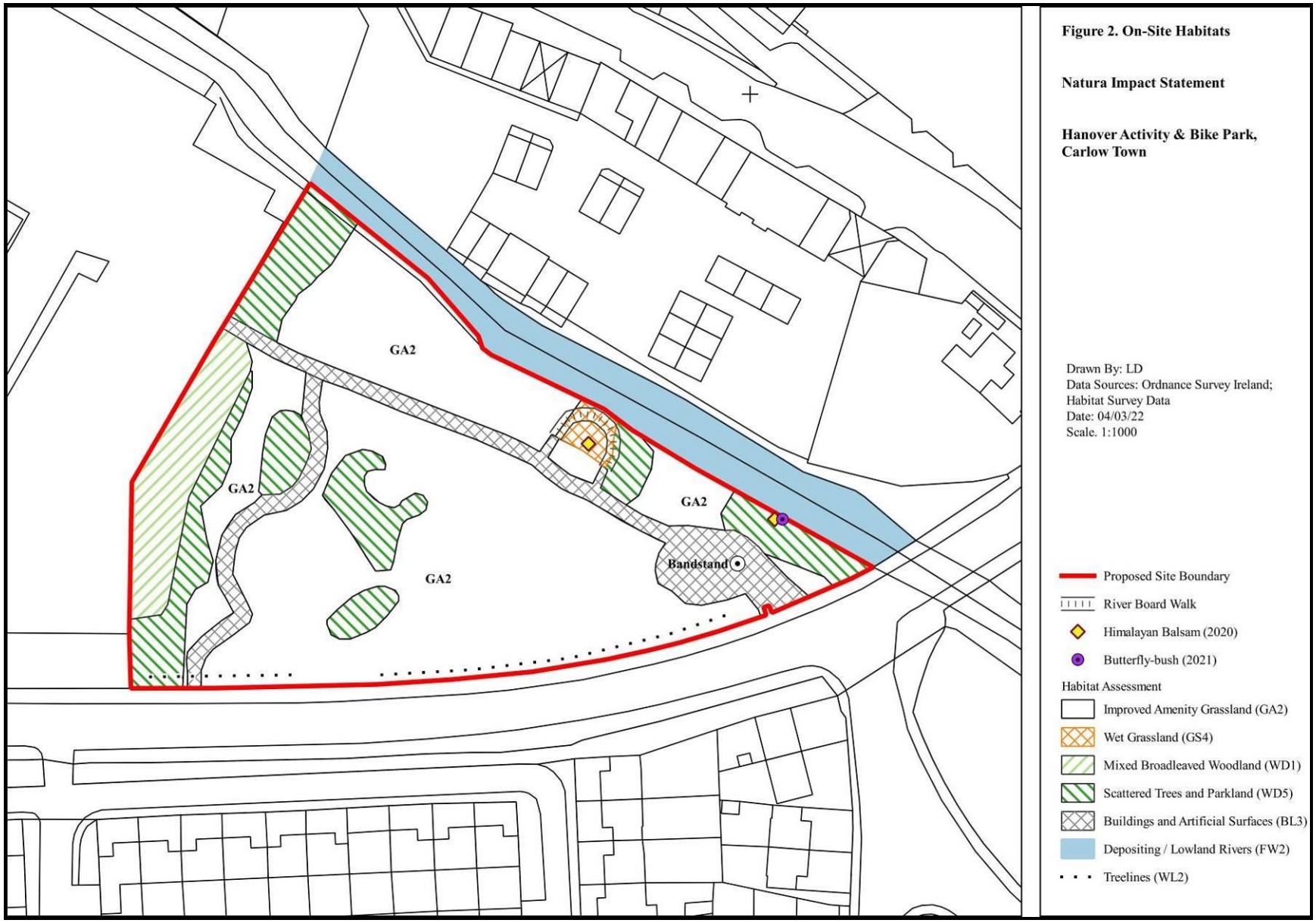
Figure 2 presents the existing habitats within the proposed site. No rare or protected plants were encountered during field surveys nor are expected to occur within the proposed site given the suite of habitats present.

4.1.3 Otters

No evidence of any protected mammals including Otter was found during any of the field surveys undertaken for the preparation of this report. However, this species is known to frequent Hanover Park (See DAU correspondence in Appendix 3) and occurs regularly along the River Burren. The nearest available NBDC records for Otter are at Hanover Bus Park (S724763) and at the nearby weir (S724762). As a qualifying interest of the nearby SAC, the occurrence of Otter along the River Burren and River Barrow is discussed further in Section 4.2.

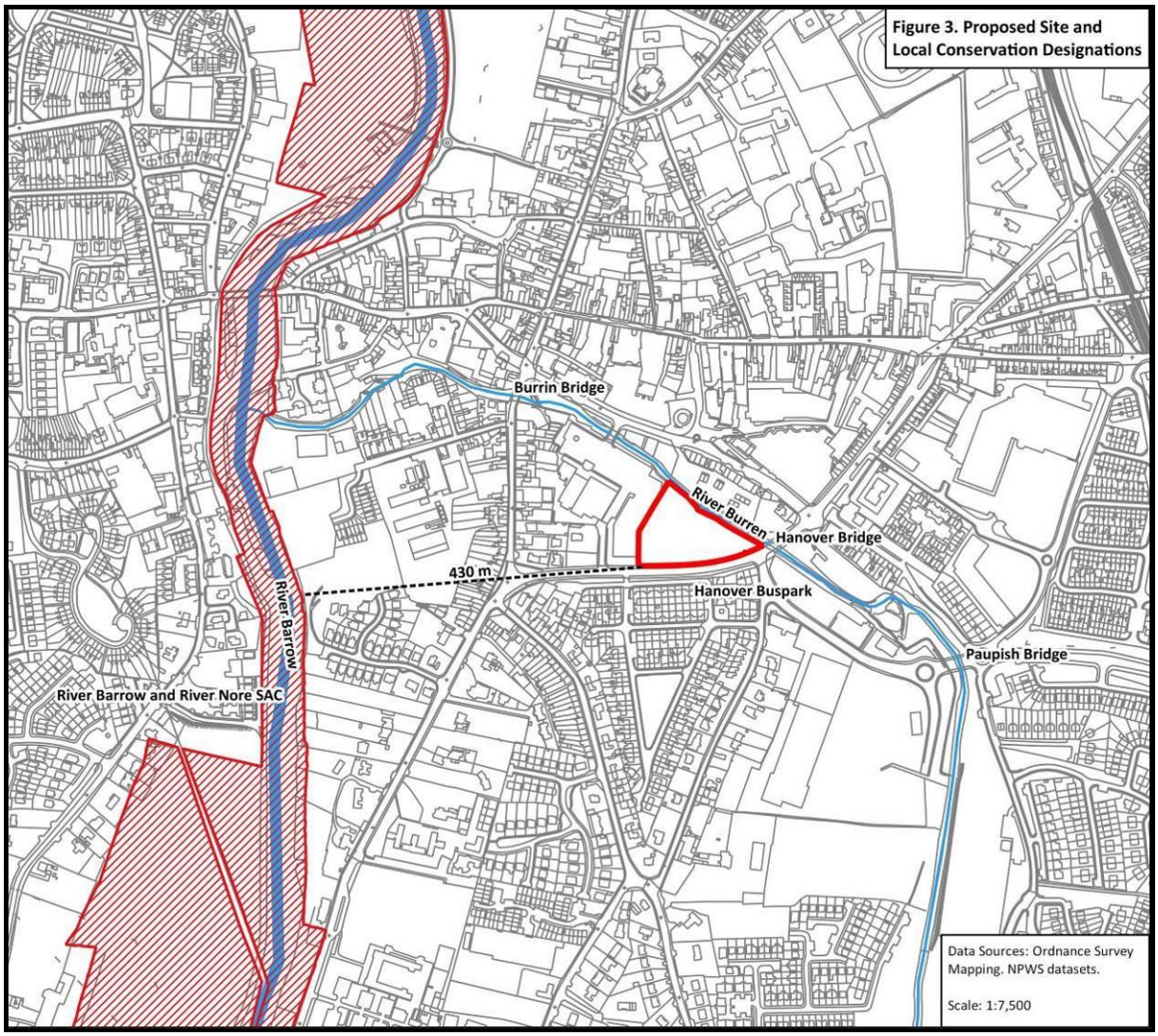
4.1.4 Local Watercourses

The fourth-order River Burren flows along the northern site boundary for 176m. The River Burren flows into the River Barrow c. 600m downstream and west of Hanover Park where it is included within the River Barrow and River Nore SAC (See Figure 3). Examination of recent aerial photography indicates that much of the riparian zone of the watercourse downstream of Hanover Park is constrained by urban development with little bankside cover. Historical mapping (25" and 6") indicates a strong history of urban development downstream particularly along the northern banks of the Burren since c.1830's. 6" historical mapping (between 1837 to 1842) indicates a more natural meandering river within 1km upstream of Hanover Park, whereas when 25" mapping was undertaken (between 1988 to 1913), this section of river had been straightened considerably with engineered banksides. Current aerial photography indicates much of the river upstream has limited bankside cover, but some development of sally and alder occurs along the left bank between the weir and Paupish Bridge, and upstream of Paupish Bridge.


GA2
GA2
GA2
GA2
Bandstand
Figure 2. On-Site Habitats
Natura Impact Statement
Hanover Activity & Bike Park, Carlow Town
Drawn By: LD
Data Sources: Ordnance Survey Ireland; Habitat Survey Data
Date: 04/03/22
Scale. 1:1000
Proposed Site Boundary
River Board Walk
Himalayan Balsam (2020)
Butterfly-bush (2021)
Habitat Assessment
Improved Amenity Grassland (GA2)
Wet Grassland (GS4)
Mixed Broadleaved Woodland (WD1)
Scattered Trees and Parkland (WD5)
Buildings and Artificial Surfaces (BL3)
Depositing / Lowland Rivers (FW2)
Treelines (WL2)

4.1.5 Water Quality of Receiving Waters

For the purposes of the Water Framework Directive (WFD), the adjacent watercourse is named Burren_60 (IE_SE_14B050500), while the water body downstream of the River Burren's confluence with the River Barrow is named BARROW_160. Burren_60 achieved 'moderate' status during the 2015-2018 monitoring period which was an improvement on the 'poor' status reported during the previous period 2010-2015. This water body achieved 'moderate' status during the previous two monitoring periods 2010-2012 and 2007-2009. Barrow_160 water body achieved consistently 'moderate' status during all monitoring periods from 2007. The chief pressures identified on both waterbodies during the 2nd cycle of the WFD river basin management included diffuse urban runoff and hydromorphological impacts from channel maintenance (WFD, 2019). Wider catchment pressures on the River Burren upstream include diffuse agricultural pollution and hydromorphological impacts from channel maintenance.



4.1.6 Invasive Species

A 'high impact' non-native invasive species, Himalayan balsam *Impatiens glandulifera* was reported to occur on site under the board walk in July 2020. Himalayan balsam is listed on the third schedule of the European Communities (Birds and Natural Habitats) Regulations 2011. Under these

Regulations any person "*who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow*" a scheduled species anywhere in the state shall be guilty of an offence.

Himalayan balsam is a tall annual plant that shades out most of our native plant species due to its rapid growth. This species is rapidly expanding its range and a major concern is that Himalayan balsam will dominate waterside vegetation and damp ground to the detriment of our native species. In autumn, the plants die back, leaving the banks bare of vegetation and more vulnerable to erosion with potential knock-on effects such as increased siltation in rivers (Kelly *et al.*, 2008).

In line with current guidance, Himalayan Balsam within the proposed site was hand-pulled in July 2020, covered with plastic sheeting and left in-situ to compost (Ciarán Brennan, written communication, 19/04/21). No evidence of new growth of Balsam was noted on-site in April 2021. The Himalayan balsam at the Park is part of a wider monitoring and control programme of invasive species by Carlow County Council.

Table 4.1 Invasive Species occurring in Proposed Site/ Within its Vicinity

Common Name	Impact Ranking*	Scheduled	Location	Proposed Site
Sycamore	Medium		S7276	
Butterfly-bush	Medium		S7276	√
Canadian Waterweed	High	√	S7276	
Himalayan balsam	High	√	S7276 - 200m u/s, also known on site	√
Brown Rat	High		S7276	

* Ranking from Invasive Species of Ireland project, undertaken by NBDC; https://www.biodiversityireland.ie/projects/invasive-species/species-lists/

The non-native invasive species, Butterfly Bush *Buddleja davidii* was recorded within the proposed site during recent field surveys. Although not listed on the third schedule of the European Regulations, it's risk is regarded of medium impact by its ability to outcompete and displace native species. NBDC records for two further 'high impact' species, Canadian waterweed and brown rat are available for the same km square as the proposed site (See Table 4.2). NBDC records for one non-native plant species considered of 'medium impact', sycamore *Acer pseudoplatanus,* was available within the same km square as the proposed site.

4.2 Impact Assessment

4.2.1 Likely Impacts of the Project

This section identifies the likely impacts of the project arising from construction and operational phases. In the context of appropriate assessment there is a clear difference between the 'impact' which is the source of the Source-Pathway-Receptor model and the 'effect' which is how it relates to the conservation objectives (OPR, 2021).

Construction Phase

Reduction in Water Quality

- Silt-laden Runoff and Soils: Activities during the development stage of the project such as clearance of vegetation and removal, grading, redistribution and levelling of topsoil and subsoils have the potential to produce large amounts of sediment-laden runoff especially during periods of heavy rainfall. If surface water runoff loaded with suspended solids enters the adjacent Burren River, this could cause increased sedimentation within the Burren and cumulatively within the River Barrow and River Nore SAC c. 600m downstream. The risk of sediment release during proposed works is considered low to moderate in view of the project scale and design which encompasses an intact 10m wide buffer zone the length of the project area along the River Burren in addition to the relatively flat topography adjacent to the river.
- Other Contaminants: The introduction of pollutants such as raw or uncured concrete and grouts, wash down water from exposed aggregate surfaces, cast-in-place concrete, fuels and lubricants into the surface water network via the adjacent watercourse could have significant adverse effects on fish, plants and invertebrates within the Burren and the River Barrow and River Nore SAC c. 600m downstream. The risk of pollutant loss to the Burren during development works is considered low to moderate in view of the relatively flat topography adjacent to the river and that the project design encompasses an intact 10m buffer the length of the project area along the River Burren.

Construction-Related Disturbance

- Increased human activity and noise during the construction phase may cause disturbance to otters and other wildlife foraging or commuting within the adjacent Burren.

Operational Phase

Noise Disturbance

- Hanover Park is an existing park in constant use. Wildlife in the area will have become habituated to human activity and noise disturbance.
- An increase in human activity and noise disturbance may arise during daylight hours during the operational phase due to the provision of additional facilities.

Lighting Disturbance

- Existing public lighting columns (6m in height) are setback at least 10m from the banks of the River Burren within the park.
- 12 No. new lighting columns (6m in height) will provide illumination along the new footpath, at the pump-track and at the play area.
- The additional lighting within the park together with existing lighting may reduce foraging habitat within Hanover Park and adjacent riparian zone for wildlife in the long-term.

Spread of Invasive Plant Species

- The reported Himalayan balsam and recorded butter-fly bush within the proposed site were located within the 10m wide riparian buffer zone, and outside of the development footprint. Should the 'high impact' Himalayan balsam or the medium-

impact butter-fly bush be allowed to spread in the long-term, they could act as a seed source of these invasive species and cause further spread downstream within the River Barrow SAC. As discussed in Section 4.1.6, control and monitoring of Himalayan baslam is being undertaken by Carlow County Council and is part of a wider on-going management programme of invasive species within Carlow town. Potential impacts arising from this species are identified on a precautionary basis.

4.2.2 Assessment of Effects on Natura Sites

Table 4.3 assesses the potential for adverse effects on the qualifying interests of the River Barrow and River Nore SAC in light of the likely impacts of the project alone and determines the necessity for mitigations. The 2019 national conservation assessment together with overall trend (in brackets) (NPWS, 2019a and 2019b) is listed for each qualifying interest in Table 4.3.

Table 4.2 Assessment of Effects on Qualifying Interests of River Barrow and River Nore SAC

Qualifying Interest	**Desmoulin's whorl snail *Vertigo moulinsiana* [1016]**
National Conservation Assessment 2019	**Inadequate (Deteriorating)**
Conservation Objective	To **maintain** the favourable conservation condition of Desmoulin's whorl snail in the River Barrow and River Nore SAC.
Targets relevant to the Project	• No decline in distribution of occupied sites. Two known sites: Borris Bridge, Co. Carlow S711503; Boston Bridge, Kilnaseer S338774, Co. Laois. • Regarding population size, at least 5 adults snails in at least 50% of samples. • Regarding population density, adult snails present in at least 60% of samples per site. • Regarding area of occupancy, minimum of 1ha of suitable habitat per site. • Habitat quality (vegetation): 90% of samples in habitat classes I and II as defined in Moorkens & Killeen (2011). • Habitat quality (soil moisture levels): 90% of samples in moisture class 3-4.
Description of QI	*V. moulinsiana* lives on living and dead stems and leaves of tall wetland plants. It is found mainly in calcareous, lowland wetlands, especially swamps, fens and marshes bordering rivers, canals, lakes and ponds. It has a requirement for tall structured vegetation containing tall riparian grasses and sedges, particularly *Glyceria maxima*, *Phragmites australis*, *Carex riparia* and *Cladium mariscus*. *V. moulinsiana* is considered to be under threat in Ireland and Europe and was assessed as Endangered on the Irish Red List. The chief pressures on this qualifying species relate to change of species composition by natural succession due to undergrazing, abandonment of management, and abiotic natural processes such as drying out, submersion, erosion and silting up (NPWS, 2019b).
Potential for Interaction with Project	There is no potential for any adverse effects on this qualifying interest arising from the project by virtue of no suitable habitat occurring within the proposed site, and no pathway for indirect effects to arise on known populations.
Mitigations Necessary?	Not required in this case.

Qualifying Interest	**Freshwater Pearl Mussel *Margaritifera margaritifera* [1029]**
National Conservation Assessment 2019	**Bad (deteriorating)**
Conservation Objective	The status of the freshwater pearl mussel (FPM) (*Margaritifera margaritifera*) as a qualifying Annex II species for the River Barrow and River Nore SAC is currently under review. The outcome of this review will determine whether a site-specific conservation objective is set for this species.
Targets relevant to the Project	N/A
Description of QI	FPM is a large, long-lived bivalve mollusc found in clean, fast-flowing rivers with relatively soft waters. Critically endangered in Ireland, the species' poor conservation status and severe declines have resulted from habitat deterioration and a combination of hydrological and morphological changes, sedimentation and enrichment of waters. FPM produce glochidial larvae that use a temporary salmonid host (Atlantic salmon, sea & brown trout). Juvenile mussels live in interstitial habitats in the riverbed for five or more years (NPWS, 2019b).
Potential for Interaction with Project	The project is located within the Barrow catchment which had pre-1970 live records of FPM (DAHG, 2012). The River Barrow and River Nore SAC is not designated for FPM directly downstream of the project. The Ballymurphy, Mountain and Aughavaud Rivers host SAC-designated populations of FPM and as such are protected under the Freshwater Pearl Mussel Regulations (S.I. 296 of 2009). These Pearl mussel designated rivers merge with the River Barrow, minimum 34km downstream of the Burren's confluence with the River Barrow. No indirect effects are anticipated on FPM due to the significant distance to shared downstream waters of this QI and the project, the assimilative capacity of intervening waters and no potential to affect any aspect of FPM lifecycle.
Mitigations Necessary?	Not required in this case.
Qualifying Interest	**White-clawed crayfish *Austropotamobius pallipes* [1092]**
National Conservation Assessment 2019	**Bad (Deteriorating)**
Conservation Objective	To **maintain** the favourable conservation condition of White-clawed crayfish in the River Barrow and River Nore SAC.
Targets relevant to the Project	• No reduction from baseline distribution. • Population structure (recruitment): Juveniles and/or females with eggs in at least 50% of positive samples. • No alien crayfish species.

	• No instances of disease. • Water quality: At least Q3-4 at all sites sampled by EPA. • No decline in heterogeneity or habitat quality.
Description QI	Freshwater crayfish distribution in Ireland extends from the smallest streams and drains to large rivers and medium-sized lakes wherever there is sufficient lime. Crayfish need a high level of habitat heterogeneity. Larger crayfish must have stones to hide under, or an earthen bank in which to burrow and hatchlings shelter in vegetation, gravel and among fine tree-roots. Smaller crayfish are typically found among weed and debris in shallow water. Larger juveniles in particular may also be found among cobbles and detritus such as leaf litter. These conditions must be available on the whole length of occupied habitat. Two major threats to White-clawed crayfish are the Crayfish plague and non-native crayfish as competitors, predators and carriers of the Crayfish plague. While Crayfish is tolerant of a wide range of water quality conditions, the link between its distribution and water quality decline requires further investigation (NPWS, 2019b).
Potential for Interaction with Project	The nearest record for this QI was located at Hanover Bridge (S725762) for 2006. More recent records for 2011 for the Burren sub-catchment are available at Rathtoe Bridge (S807713) and Ballintrane Bridge (S797677), c. 12km and 18km upstream of the proposed site respectively. The nearest records for the River Barrow are located at Dolmen Hotel footbridge (S706741) c. 3km downstream of the site. The Crayfish plague has been recorded within the River Barrow main channel since 2017 (EPA Catchments Unit, 2017). The release of sediment or other pollutants to the adjacent Burren river may adversely affect the distribution/or population of Crayfish further downstream, either alone or cumulatively.
Mitigations Necessary?	Yes. Mitigations to protect the water quality of the River Burren and the protected River Barrow will be applied during the development phase.
Qualifying Interest	**Sea Lamprey *Petromyzon marinus* [1095]**
National Conservation Assessment 2019	**Bad (Stable)**
Conservation Objective	To restore the favourable conservation condition of Sea lamprey in the River Barrow and River Nore SAC
Targets relevant to the Project	• Greater than 75% of main stem length of rivers accessible from estuary. • At least three age/size groups present. • Juvenile density at least 1/m². • No decline in extent and distribution of spawning beds.

	• More than 50% of sample sites positive.
Description QI	The lifecycle of Sea lamprey has both a marine and freshwater phase. Adult Sea lamprey live on host fish or marine mammals at sea and when large enough, migrate to freshwaters in spring to excavate redds or spawning beds in gravels in larger rivers. The presence of obstacles such as large weirs significantly limit Sea lamprey accessing suitable spawning or juvenile habitats in rivers, irrespective of the availability and suitability of such habitats within catchments (NPWS, 2019b).
Potential for Interaction with Project	Low densities of Sea lamprey juveniles were found in four tributaries of the River Barrow, namely the River Fushoge, River Acore, Duiske Stream and Maudlins River (King, 2006). Sea lamprey is listed as 'Near Threatened' in the Ireland Red List (King *et al.,* 2011). Given that the Fushoge discharges to the River Barrow c. 4km of the proposed site, the potential for the proposed development to interact with this qualifying species is identified on a precautionary basis in view of potential for adverse effects on water quality.
Mitigations Necessary?	Yes. Mitigations to protect the water quality of the River Burren and the protected River Barrow will be applied during the development phase.
Qualifying Interest	**Brook Lamprey *Lampetra planeri* [1096]**
National Conservation Assessment 2019	**Favourable (Stable)**
Conservation Objective	To restore the favourable conservation condition of Brook lamprey in the River Barrow and River Nore SAC
Targets relevant to the Project	• Access to all water courses down to first order streams. • At least three age/size groups of brook/river lamprey present. • Mean catchment juvenile density of Brook/River Lamprey at least 2/m². • No decline in extent and distribution of spawning beds. • More than 50% of sample sites positive.
Description and Status of QI	Unlike the other two lamprey species, Brook lamprey is non-parasitic and non-migratory as an adult. It lives its entire life in freshwater. Adults excavate shallow nests and spawn in Spring in relatively small-sized gravels in areas of reduced flow. The hatched larvae drift or swim downstream to areas of the riverbed or margins with fine silt deposits. A variety of medium scale threats have been identified on Brook lamprey, including, land-spreading of organic and inorganic manures on agricultural land, clear felling of trees/forestry, drainage, hydropower and pollution of surface or ground water due to urban runoff (NPWS, 2019b).
Potential for Interaction with Project	King undertook an electrofishing survey programme of the Barrow catchment during 2004 which focussed on juvenile

	lamprey. As it is not possible to distinguish between juvenile River and Brook lamprey in the field, no data was collected on their individual distributions and abundances within the Barrow catchment. This study indicated that the Burren River had relatively high densities of River/Brook lamprey at the two patches fished (King, 2006). Increased sedimentation within the water column arising from the project alone during the development phase or in-combination with other projects/plans has the potential to reduce suitable spawning areas for this species. Release of pollutants such as cement / cementitious residues has the potential to cause fish mortality or morbidity.
Mitigations Necessary?	Yes. Mitigations to protect the water quality of the River Burren and the protected River Barrow will be applied during the development phase.
Qualifying Interest	**River Lamprey Lampetra fluviatilis [1099]**
National Conservation Assessment 2019	**Unknown**
Conservation Objective	To restore the favourable conservation condition of River lamprey in the River Barrow and River Nore SAC
Targets relevant to the Project	• Greater than 75% of main stem and major tributaries down to second order accessible from estuary. • At least three age/size groups of River/Brook Lamprey present. • Mean catchment juvenile density of Brook/River Lamprey at least 2/m². • No decline in extent and distribution of spawning beds. • More than 50% of sample sites positive.
Description of QI	River lamprey are parasitic as adults, attaching to larger fish within coastal waters and breeding in freshwater rivers and streams. Adults spawn in Spring, excavating shallow nests in river sections with fine gravels and small stones. The hatched larvae drift or swim downstream to areas of the riverbed or margins with fine silt deposits (NPWS, 2019b). Accurate reporting for this species is problematic due to the inability to distinguish between juvenile Brook and River lamprey, and the difficulties in sampling for adult River lamprey. The main pressures on this species include hydropower and associated infrastructure, changes in precipitation due to climate change, application of organic or inorganic fertilisers, land drainage, shipping/ferry lanes and associated infrastructure (NPWS, 2019b).
Potential for Interaction with Project	King undertook an electrofishing survey programme of the Barrow catchment which focussed on juvenile lamprey. As it is not possible to distinguish between juvenile River and Brook lamprey in the field, no data was collected on their individual distributions and abundances within the Barrow catchment. This study indicated that the Burren River had relatively high densities of River/Brook lamprey at the two patches fished (King, 2006).

	Increased sedimentation within the water column arising from the project alone during the development phase or in-combination with other projects/plans has the potential to reduce suitable spawning areas for this species. Release of pollutants such as cement / cementitious residues has the potential to cause fish mortality or morbidity.
Mitigations Necessary?	Yes. Mitigations to protect the water quality of the River Burren and the protected River Barrow will be applied during the development phase.
Qualifying Interest	**Twaite Shad *Alosa fallax fallax* [1103]**
National Conservation Assessment 2019	**Bad (Stable)**
Conservation Objective	To restore the favourable conservation condition of Twaite shad in the River Barrow and River Nore SAC
Targets relevant to the Project	• Greater than 75% of main stem length of rivers accessible from estuary. • More than one age class present. • No decline in extent and distribution of spawning habitats. • No lower than 5mg/l oxygen levels. • Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plants) growth.
Description of QI	Twaite shad is a diadromous fish, spending most of its life in estuaries and coastal waters but returning upriver to spawn in late May/early June to gravelled areas of main-stem SAC rivers with a moderate gradient and a diversity of depth-velocity conditions. In Ireland, adults migrate into the upper tidal freshwater areas of the main designated rivers (NPWS, 2019b).
Potential for Interaction with Project	Twaite shad are known to spawn in the upper tidal limit of the River Barrow downstream of St Mullins, Co. Carlow (Doherty *et al.,* 2004). This species is listed as 'Vulnerable' in the Ireland Red List 2011 due to its very restricted distribution (King *et al.,* 2011). The NBDC database reports a single record of Twaite shad, with three caught at St Mullins on 10/05/2014 (Irish Federation Sea Anglers Catch). Given the predominantly coastal nature of this species, its occurrence in estuarine waters at least 50km downstream of the site, and the assimilative capacity of intervening waters, there is no potential for the project to have adverse effects on this qualifying interest.
Mitigations Necessary?	Not required in this case.

Qualifying Interest	**Atlantic Salmon *Salmo salar* [1106]**
National Conservation Assessment 2019	**Inadequate (Stable)**
Conservation Objective	To restore the favourable conservation condition of Salmon in the River Barrow and River Nore SAC
Targets relevant to the Project	• 100% of river channels down to second order accessible from estuary. • Conservation Limit (CL) for each system consistently exceeded. • Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling. • No significant decline in out-migrating smolt abundance. • No decline in number and distribution of spawning redds due to anthropogenic causes. • At least Q4 at all sites sampled by EPA.
Description of QI	An anadromous species, Salmon juveniles usually spend two years in rivers, before going to sea as smolts. The majority of fish spend one winter at sea and then return to their natal river as grilse. Spawning occurs in freshwater in channels of suitable gradient with cobble/gravel beds in the November - March period (King *et al.*, 2011). Marine survival of Salmon is identified as a key determinant of trends of population size in natal rivers in Ireland and internationally. Within river systems, variation in stock abundance is influenced by a variety of factors, especially alterations in physical habitat, water quality, environmental factors, predation, and angling and commercial fisheries exploitation. While habitat for the species has been assessed as "Good" because there is considered to be sufficient habitat in Ireland as a whole to support a viable salmon population, water quality in Irish freshwaters continues to be a concern and Ireland continues to face major challenges to achieve water quality targets set for 2021 and 2027 (NPWS, 2019b).
Potential for Interaction with Project	Inland Fisheries Ireland undertook a catchment-wide electrofishing survey in the River Barrow catchment during summer 2015. Brown trout and Atlantic salmon were the most common fish species recorded in the sub-catchments. Salmonids were the dominant fish species at all sites fished within the River Burren, with Salmon absent from only one site out of the five fished. Good densities of Salmon fry were recorded within the lower reaches of the river (at Rathtoe Bridge) which indicates good spawning potential within the river (Delanty *et al.*, 2017). Increased sedimentation within the water column arising from the project alone or in-combination with other projects/plans has the potential to reduce suitable habitat, particularly holding pools, downstream for this species. Release

	of pollutants such as cement / cementitious residues has the potential to cause fish mortality or morbidity.
Mitigations Necessary?	Yes. Mitigations to protect the water quality of the River Burren and the protected River Barrow will be applied during the development phase.
Qualifying Interest	**Otter *Lutra lutra* [1355]**
National Conservation Assessment 2019	**Favourable (Improving)**
Conservation Objective	To restore the favourable conservation condition of Otter in the River Barrow and River Nore SAC
Targets relevant to the Project	• No significant decline in distribution. • No significant decline in area of terrestrial habitat. • No significant decline in area of marine habitat. • No significant decline in extent of freshwater (river) habitat. • No significant decline in extent of freshwater (lake/lagoon) habitat. • No significant decline in couching sites and holts. • No significant decline in fish biomass availability.
Description of QI	Otters occur in a variety of aquatic habitats including rivers, streams, canals, lakes and along the coast. Rarely found far from water, they normally occupy linear home ranges in rivers and streams. In Ireland, the territory of female Otters along rivers is an average of 7.5km in length, whilst that of male Otters is usually c. 13.2km in length (Reid *et al*., 2013). The three main threats to Otter populations in Ireland are habitat destruction, water pollution and accidental death (i.e. road kills) or persecution (NPWS, 2009).
Potential for Interaction with Project	No signs of Otter in the form of spraints, lie-up areas, or holts were recorded either within Hanover Park or in it's vicinity during the survey undertaken as part of this NIS. However, review of the NBDC database indicates that Otter is prevalent within the Barrow catchment around Carlow town and upstream along the Burren River. As discussed in Section 4.1.3, several records for live sightings are given for Hanover Bus Park, adjacent to the proposed site for 2014. In their consultation response, the NPWS reports that Hanover Park has very regular Otter sightings, mostly during the hours of darkness at the bridge at the Old Penny's carpark. The literature indicates that Otters will rest at sites close to high levels of human activity, that they are very flexible in their use of resting places, and do not necessarily avoid 'disturbance' in terms of noise or proximity to human activity (Chanin, 2003). The National Otter survey 2010/2012 concurred that perceived levels of disturbance appeared to have no effect on otter occurrence (Reid *et al.,* 2013). Holts or couches may be

supported along the banks of the Burren in more secluded locations. However, given the urban nature of Hanover Park, and in view of little or no overshading trees along the stretch at the park, no suitable habitat for Otter resting places is present at or near to the proposed site. The Burren River at Hanover is important to Otter from a foraging and commuting viewpoint as it provides connectivity between the Burren River upstream of the site, and the downstream River Barrow.

The following indirect threats to Otters are identified:

- As a crepuscular species, Otters are most active at dawn and dusk, and so may be partially disturbed by development works which will be from 7am to 7pm (Monday to Friday). Such disturbance at most would cause temporary displacement of otters and / or modification of commuting and foraging behaviour during the construction period.
- Increased noise and human activity during the operational phase will be primarily during daylight hours and will not intersect the Otters main activity period.
- Existing light columns are situated outside 10m of the Burren River. Columns are 6m in height which minimises light spill to the riparian zone. 12 No. additional light columns (6m in height) are proposed as part of this development. The Horizontal Illuminance model of the proposed lighting scheme produced by Enerveo (2022) indicates main illumination from the proposed scheme will be concentrated at the play area and at the path junction near Penney's entrance. No additional light spill is anticipated along the riparian corridor because of the proposed lighting scheme. Potential light disturbance on bats and proposed mitigations are discussed further in Sections 5.3.2 and 6.2.4 of the EcIA respectively.
- Increased sedimentation or pollutants within the water column of the Burren arising from the project alone or in-combination with other projects/plans has the potential to cause indirect effects on Otter populations due to decreased prey availability by reduction of suitable spawning habitat, and/or indirect impacts on fish populations.

Mitigations Necessary?

Yes. Mitigations to protect the water quality of the River Burren and the protected River Barrow will be applied during construction. Lighting mitigations will be applied to reduce potential disturbance effects on Otter during the Park's operation.

Qualifying Interest	**Nore freshwater pearl mussel (*Margaritifera durrovensis*) [1990]**
National Conservation Assessment 2019	**Bad (deteriorating)**
Conservation Objective	To restore the favourable conservation condition of the Nore freshwater pearl mussel in the River Barrow and River Nore SAC
Targets relevant to the Project	N/A
Description of QI	The Freshwater pearl mussel is a large, long-lived bivalve mollusc found in clean, fast-flowing rivers with relatively soft waters. Critically endangered in Ireland, the species' poor conservation status and severe declines have resulted from habitat deterioration and a combination of hydrological and morphological changes, sedimentation and enrichment of waters. Pearl mussels produce glochidial larvae that use a temporary salmonid host (Atlantic salmon, sea & brown trout). Juvenile mussels live in interstitial habitats in the riverbed for five or more years (NPWS, 2019b). The Nore freshwater pearl mussel is restricted to the Nore catchment, with the population stretching from Poorman's Bridge (S407859) to Lismaine Bridge (S442660), with most of the population found between Poorman's Bridge and the Avonmore Creamery above Ballyragget (S440 722) (NPWS, 2011).
Potential for Interaction with Project	As this qualifying interest is located within a separate river catchment, there is no potential for direct or indirect effects due to the absence of a complete source-pathway-receptor model.
Mitigations Necessary?	Not required in this case.
Qualifying Interest	**Vegetation of Flowing Waters [3260]**
National Conservation Assessment 2019	**Inadequate (Deteriorating)**
Conservation Objective	To maintain the favourable conservation condition of Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation in the River Barrow and River Nore SAC
Targets relevant to the Project	• No decline in distribution subject to natural processes. • Habitat area of sub-tidal type stable at 12.6km or increasing. • Maintain appropriate hydrological regimes. • Maintain natural tidal regime.

	• For the tidal sub-type, the substratum of the channel must be dominated by particles of sand to gravel, with silt at the river margins. • The concentration of nutrients in the water column must be sufficiently low to prevent changes in species composition or habitat condition. • Typical species of the relevant habitat sub-type reach favourable status. • The area of active floodplain at and upstream of the habitat must be maintained.
Description of QI	Watercourses characterised by submerged or floating-leaved vegetation form a priority habitat of international importance and are listed on Annex II of the Habitats Directive. The definition of watercourses characterised by *Ranunculion fluitantis* and *Callitricho-Batrachion* communities is very broad, and in practice includes the majority of rivers and streams with aquatic plant communities (Hatton-Ellis and Grieve, 2003). The main problems for river habitats in Ireland are damage through hydrological and morphological change, eutrophication and other water pollution (NPWS, 2019a).
Potential for Interaction with Project	The full distribution of this habitat type within the River Barrow and River Nore SAC is unknown and sub-types of this habitat type are poorly understood (NPWS, 2011). This qualifying habitat was not observed within the Burren River in proximity to the proposed site. However, this habitat type is likely to occur in the River Barrow downstream of the project area. Increased silt and/or other pollutants within the water column arising from the project alone or in-combination with other projects/plans has the potential cause a decline in this habitat type due to a decline in suitable physico-chemical conditions.
Mitigations Necessary?	Yes. Mitigations to protect the water quality of the River Burren and the protected River Barrow will be applied during the development stage.
Qualifying Interest	**Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]**
National Conservation Assessment 2019	**Bad (Deteriorating)**
Conservation Objective	To maintain the favourable conservation condition of Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels in the River Barrow and River Nore SAC.
Targets relevant to the Project	• No decline in habitat distribution, subject to natural processes. • Habitat area stable or increasing, subject to natural processes. • Hydrological regime (Flooding depth/height of water table): Maintain appropriate hydrological regimes.

- Vegetation structure (sward height): 30-70% of sward is between 40 and 150cm in height.
- Vegetation composition (broadleaf herb: grass ratio): Broadleaf herb component of vegetation between 40 and 90%.
- Vegetation composition (typical species): At least 5 positive indicator species present.
- Vegetation composition (negative indicator species): Negative indicator species, particularly non-native invasive species, absent or under control- NB Indian balsam (*Impatiens glandulifera*), monkeyflower (*Mimulus guttatus*), Japanese knotweed (*Fallopia japonica*) and giant hogweed (*Heracleum mantegazzianum*).

Description of QI

Three distinct communities of Hydrophilous tall-herb swamp have been identified in Ireland, two of which occur in the lowlands:

- The first community type occurs along unmanaged edges of slow-moving rivers and the margins of lakes where nutrient levels may be naturally high. This community is dominated by hydrophilous herbs including Angelica sylvestris, *Filipendula ulmaria*, *Irish pseudocorus*, *Lysimachia vulgaris*, *Lythrum salicaria*, *Valeriana officinalis*, *Equisetum fluviatile* and *E. palustre*.
- The second community type occurs as woodland borders, referred to as a saum community. Typical species are likely to include *Alliaria petiolata*, *Anthriscus sylvestris*, *Eupatorium cannabinum*, *Geranium robertianum*, *Geum urbanum*, *Petasites hybridus* and *Vicia sepium*. There has not been a comprehensive survey of this community type in Ireland (NPWS, 2019a).

Potential for Interaction with Project

The distribution of this habitat within the River Barrow and River Nore SAC is unknown. It is considered to occur in association with some riverside woodlands, unmanaged river islands and in narrow bands along the floodplain of slow-flowing stretches of river (NPWS, 2011).

This qualifying habitat was not observed along the banks of the Burren River in proximity to the proposed site. However, this habitat type is likely to occur along the banks of the Barrow downstream of the project area. While Himalayan balsam is known to occur within the riparian zone of the Burren, within the proposed site, indirect effects from this population are considered unlikely by virtue of it being actively controlled by Carlow County Council, and not within the proposed development footprint. A limited degree of Butterfly Bush was recorded on the site bank of the proposed site near Hanover Bridge. Without control, further proliferation of this medium impact invasive species could contribute to potential future populations downstream with potential adverse effects on this qualifying habitat. The import of topsoil into the Park could inadvertently introduce other non-native invasive species such as Japanese Knotweed and Giant Hogweed into the proposed site. Establishment of such species along the riverbank would act as a potential source for dispersal of these

	invasive species further downstream along the River Barrow, with potential long term indirect effects on Hydrophilous tall-herb swamp through change in species composition.
Mitigations Necessary?	Yes, mitigations will be required to prevent the introduction of invasive non-native plants into the Park, and to prevent the spread of existing invasive plant species within the Park, and along the banks of the Burren River during construction and operational phases.
Qualifying Interest	**Petrifying Springs [7220]***
National Conservation Assessment 2019	**Inadequate (Deteriorating)**
Conservation Objective	To maintain the favourable conservation condition of Petrifying springs with tufa formation (Cratoneurion) in the River Barrow and River Nore SAC.
Targets relevant to the Project	N/A
Description of QI	Petrifying spring is a priority Annex I habitat. They are lime-rich water sources where tufa is actively deposited and where characteristic species of bryophytes are dominant or abundant. Among the threats and pressures on this habitat type are changes in grazing or mowing regime, infrastructure development, mixed source pollution, drainage or alteration in hydrological flow (NPWS, 2019a).
Potential for Interaction with Project	The distribution of this habitat within the River Barrow and River Nore SAC is unknown. This qualifying habitat is not present within or in the vicinity of the proposed site. Potential indirect effects on this qualifying interest due to potential water quality deterioration are identified on a precautionary basis.
Mitigations Necessary?	Yes. Mitigations to protect the water quality of the River Burren and the protected River Barrow will be applied during the development phase.
Qualifying Interest	**Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) [91E0]***
National Conservation Assessment 2019	**Bad (Deteriorating)**
Conservation Objective	To restore the favourable conservation condition of Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) in the River Barrow and River Nore SAC
Targets	• Habitat area stable or increasing. • No decline in habitat distribution. • Woodland size: area stable or increasing. Where topographically possible, “large” woods at least 25ha in size and “small” woods at least 3ha in size.

- Woodland structure (cover & height): diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer subject to natural processes, at least 181.54ha for sites surveyed.
- Woodland structure (community diversity & extent): maintain diversity and extent of community types.
- Woodland structure (natural regeneration): Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy.
- Hydrological regime (flooding depth/height of water table): appropriate hydrological regime necessary for maintenance of alluvial vegetation.
- Woodland structure (dead wood): At least 30m³/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter (greater than 20cm diameter in the case of alder).
- Woodland structure (veteran trees): no decline.
- Woodland structure (indicators of local distinctiveness): no decline.
- Vegetation composition (native tree cover): no decline. Native tree cover not less than 95%
- Vegetation composition (typical species): A variety of typical native species present, depending on woodland type, including ash (*Fraxinus excelsior*) alder (*Alnus glutinosa*), willows (*Salix* spp) and locally, oak (*Quercus robur*).
- Vegetation composition (negative indicator species): negative indicator species, particularly non-native invasive species, absent or under control.

Description of QI

Alluvial woodland is a priority Annex I habitat. This woodland type occurs on heavy soils which are periodically flooded by the annual rise of river levels. There are several types of this habitat, the most common of which is riparian woodland of ash and alder (NPWS, 2019a).

Potential for Interaction with Project

The proposed site does not contain this habitat type. The nearest identified Alluvial woodland downstream is located along the western bank of the Barrow c. 8.5km downstream of the project. The project has no potential to have direct impacts on this qualifying habitat. Indirect effects on this habitat may occur should the project allow the increased spread and subsequent dispersal of non-native invasive plant species (such as Himalayan balsam and butterfly bush) by acting as a seed source. The import of topsoil into the Park could inadvertently introduce non-native invasive species such as Japanese knotweed and giant hogweed into the area. Establishment of such species along the riverbank would act as a potential

	source for further dispersal of these invasive species further downstream along the River Barrow, with potential long term indirect effects on Alluvial forests through change in species composition
Mitigations Necessary?	Yes, mitigations will be required to prevent the introduction of invasive non-native plants into the Park, and to prevent spread of invasive plant species within the Park during construction and operational phases.
Qualifying Interest - National Conservation Assessment 2019	**Estuaries [1130] - Inadequate (Deteriorating)** **Mudflats and sandflats not covered by seawater at low tide [1140] - Inadequate (Deteriorating)** ***Salicornia* and other annuals colonizing mud and sand [1310] – Favourable (Stable)** **Atlantic salt meadows (G*lauco-Puccinellietalia maritimae*) [1330] - Inadequate (Deteriorating)** **Mediterranean salt meadows (*Juncetalia maritimi*) [1410] - Inadequate (Deteriorating)**
Conservation Objectives	To maintain the favourable conservation condition of Estuaries in the River Barrow and River Nore SAC To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in the River Barrow and River Nore SAC To maintain the favourable conservation condition of *Salicornia* and other annuals colonizing mud and sand in the River Barrow and River Nore SAC To restore the favourable conservation condition of Atlantic salt meadows in the River Barrow and River Nore SAC To restore the favourable conservation condition of Mediterranean salt meadows in the River Barrow and River Nore SAC
Targets relevant to the Project	N/A
Description of QI	The listed qualifying habitats are >50km downstream of the project and are dominated by marine and coastal influences.
Potential for Interaction with Project	By virtue of the above qualifying habitats being influenced by marine processes and / or by the assimilative capacity of intervening waters > 50km distance, and in consideration of the projects small scale, there is no potential for direct or indirect effects on the listed qualifying habitats.
Mitigations Necessary?	Not required for these qualifying habitats.
Qualifying Interest - National Conservation Assessment 2019	**Killarney fern (*Vandenboschia speciosa*) [1421] - Favourable (Stable)** **European dry heaths [4030] - Bad (Stable)** **Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] - Bad (Deteriorating)**

Conservation Objectives	To maintain the favourable conservation condition of Killarney fern in the River Barrow and River Nore SAC To maintain the favourable conservation condition of European dry heaths in the River Barrow and River Nore SAC To restore the favourable conservation condition of Old sessile oak woods in the British Isles sand in the River Barrow and River Nore SAC
Targets relevant to the Project	N/A
Description of QI	The listed qualifying interests are terrestrial habitats and species not found within the proposed site nor within its zone of influence.
Potential for Interaction with Project	By virtue of the above qualifying interests being wholly terrestrial in nature and not occurring within the zone of influence of the proposal, there is no ecological pathway for potential direct or indirect effects on these qualifying interests.
Mitigations Necessary?	Not required for these qualifying interests.

4.3 Cumulative and In-Combination Effects

In accordance with the EC guidance document on conducting Appropriate Assessment (EC, 2001), other projects or plans in the area must be considered in combination with the proposal to determine the potential for having any significant cumulative effects on the Natura 2000 sites within the zone of influence of the project.

Potential effects of the project alone on the SAC have been identified as indirect effects on water quality, potential seed source of invasive species and potential disturbance effects on the qualifying species Otter within the Burren River.

4.3.1 Carlow County Development Plan 2015 – 2021

This document sets out Carlow County Council's policies and objectives for the proper planning and sustainable development of the County from 2015 to 2021. The following policies may have in-combination effects with the proposal.

Relevant Policies and Objectives	Natura 2000 Impacts
It is the policy of Carlow County Council to:	
Rec Policy 4	
○ Protect and improve the natural amenity potential and accessibility of River Barrow, River Slaney and River Burren subject to appropriate environmental assessments including Habitats Directive Assessment, the Water Framework Directive and Floods Directive	Positive
Rec Policy 5	
○ Require that development along rivers set aside land for pedestrian routes that could be linked to the broader area and any established settlements in their vicinity, subject to screening for potential impacts on European Sites in accordance with the EU Habitats Directive	Neutral
Heritage Policy 2	
○ Strive to protect and maintain the favourable conservation status and conservation value of all natural heritage sites designated or proposed for designation in accordance with European and National legislation and in other relevant international conventions, agreements and processes. This includes sites designated or proposed as Special Areas of Conservation (SACs) and proposed Natural Heritage Areas (pNHAs), wild bird species and their habitats, especially rare or vulnerable species and regularly occurring migratory species	Positive
○ Promote the maintenance and, as appropriate, the achievement of favourable conservation status of protected habitats and species in association with the NPWS	Positive
○ Assess, in accordance with the relevant legislation, all proposed developments which are likely to have a significant effect (directly or through indirect or cumulative impact) on designated natural heritage sites, sites proposed for designation and protected species	Neutral
○ Comply fully with Article 6 of the EU Habitats Directive (as transposed into Irish Law by the EU Habitats Regulations 1997 and subsequent amendments) and assess	Positive

whether the plan or project is likely to have a significant impact upon the integrity, conservation objectives and qualifying interests of any Natura 2000 site, when considering any plan or project prepared or assessed on the basis of this development plan	
Heritage Objective 4	
○ Protect rivers, streams and other water courses and their associated Core Riparian Zones (CRZs) wherever possible and maintain them in an open state, capable of providing suitable habitats for fauna and flora	Positive
Heritage Objective 6	
○ Prevent the spread of invasive species within the Plan area, including requiring landowners and developers to adhere to best practice guidance in relation to the control of invasive species	Positive
○ Seek the control and/or eradication of invasive species, as appropriate, within the Plan area, as opportunities and resources allow. Targeted invasive species control should be informed by current distribution of species, degree of threat posed and resources available to control and/or eradicate them	Positive
○ Promote public awareness and engagement with regard to invasive species through awareness campaigns and the provision of targeted information on the role of the general public in the control of invasive species	Positive

4.3.2 National River Basin Management Plan 2018 – 2021

Relevant Policies and Objectives	Natura 2000 Impacts
This Plan seeks to ensure full compliance with the Water Framework Directive (WFD).	
• This Plan adapted a targeted approach to focus on identified prioritised risk areas (or catchments) known as Areas for Action. The Burren catchment is a listed targeted catchment under the current Plan.	Positive
• The upper catchment of the River Burren is one of two areas targeted in Co. Carlow as part of the "Blue Dot Catchments Programme" which has the aim of protecting and restoring high ecological status to a network of river and lake catchments. This programme ensures that high-status waters are prioritised for the implementation of supporting measures and for available funding.	Positive

4.3.3 Recent Planning Permissions

Planning Applications in the Area	Carlow County Council planning website was consulted with respect to granted or proposed developments within 500m of Hanover Park within the last five years which may have cumulative effects with the proposal. The following large projects were identified from this search due to their scale and proximity to the River Burren as having the potential to interact with and cause in-combination effects with the proposed development. • 18433 – permission pertains to a retail unit being partly subdivided in Carlow Retail Park, development of a mezzanine level, provision of new

	pedestrian access among other works. An NIS was included with this application. • 19478 - refurbishment of the existing store (Primark Ltd) including retail, staff area, stock room, external envelope, new plant buildings and replacement roof to the retail store. An NIS was included with application. • 21114 – permission for development of Aldi site to include demolition of existing store, construction of a new part 2-storey food store, upgrade to existing carpark, vehicular and pedestrian access and other works. An NIS was included as part of this application.

- In addition to the above, Carlow Municipal District undertook small-scale upgrade works at the Park during October 2021 which included upgrade of existing footpath, installation of an outdoor classroom (c. 145m^2), refurbishment of bandstand, upgrade of lighting to LED to improve efficiency and relocation of lighting columns outside of 10m setback from river. Potential adverse effects of this development to the Natura 2000 network were ruled out at Appropriate Assessment Screening stage.
- Carlow Municipal District are in the process of completing cycling routes along the Kilkenny Road adjacent to Hanover Park under the Active Travel Programme.

The National River Basin Management Plan 2018 – 2021 has specific target measures to ameliorate water quality in the River Burren catchment as a whole, and to protect and restore the water quality of upper reaches of the catchment. Carlow County Development Plan 2015 – 2021 undertakes to comply fully with Article 6 of the EU Habitats Directive to ensure all plans and projects are assessed with respect to the likelihood of having a significant impact upon the integrity, conservation objectives and qualifying interests of any Natura 2000 site. No cumulative impacts were identified arising from the project that could cause significant adverse effects on the Natura 2000 network. No additional in-combination impacts were identified that might arise from the interaction of projects and plans with the proposal.

5 MITIGATION MEASURES

5.1 Protection of Surface Waters

The following mitigations will prevent indirect effects on the structure and function of the River Barrow and River Nore SAC and the following water-dependent qualifying interests: White-clawed crayfish *Austropotamobius pallipes* [1092], Sea lamprey *Petromyzon marinus* [1095], Brook lamprey *Lampetra planeri* [1096], River lamprey *Lampetra fluviatilis* [1099], Atlantic salmon *Salmo salar* [1106], Otter *Lutra lutra* [1355], Floating River Vegetation [3260] and Petrifying Springs [7220].

Riparian Buffer Zone

- A permanent buffer zone of minimum 10m width will be established along the River Burren along the southern bank of the River. This buffer zone will be designated and fenced for the duration of development works before site clearance and development works commence on site. The buffer zone will remain intact throughout all phases of development. Vehicles and

construction personnel will be precluded from entering this buffer zone during the development phase.

- A silt fence such as Terrastop™ Premium (https://ssienvironmental.ie/product/silt-fence/) will be installed on the boundary of the buffer zone prior to all site clearance and development works in order to control suspended solids emissions from the development footprint.
- No stockpiling of soils or any materials will take place within this buffer zone.
- This 10m setback will be maintained as a wildlife zone during the operational phase.

Management of Soils and Sediment-laden Runoff

- Site clearance and earthworks will be delayed until shortly before development begins to reduce the window for generation of silt-laden runoff.
- All temporary stockpiles of soils, sands and gravels will be sited outside of the fenced riparian buffer zone and will be covered by sheeting to reduce the generation of silt-laden runoff.
- Any areas of bare ground will be reseeded immediately after development works cease in order to minimise the period of exposed soils.

Management of Other Potential Pollutants

- When cast-in-place concrete is required all work will be done in the dry and isolated from any water that may enter the drainage network for a period sufficient to cure the concrete. Wash down water from exposed aggregate surfaces and cast-in place concrete will be trapped on site to allow sediment to settle out and reach neutral pH before clarified water is allowed to percolate to ground.
- Concrete delivery vehicles will be precluded from washing out at or in the environs of the site, or at such a location as would result in discharge to surface waters.
- If bagged cement is stored on site during construction, it will be held in a dry secure area when not in use.
- Raw or uncured waste concrete will be disposed of by removal from the site in a manner that will not impact on any watercourse.
- Fuels, lubricants and hydraulic fluids for equipment used on the site will be carefully handled to avoid spillage, properly secured against unauthorised access, and stored in bunded compounds. Bunding should be to a volume not less than the following: 110% of the capacity of the largest tank or drum within the bunded area, or 25% of the total volume of substance that could be stored within the bunded area.
- Construction plant will be stored off site overnight.

5.2 Lighting Mitigations

The following additional mitigations will be applied to prevent indirect disturbance effects on the qualifying interest Otter *Lutra lutra* [1355]:

- Dimming of proposed and existing lighting to Class P5 (3 Lux average and 0.6 Lux minimum) between 23.00 hrs. and 06.00hrs.

5.3 Control of Invasive Species

The following mitigations will prevent indirect effects on the structure and function of the River Barrow and River Nore SAC and the following aquatic qualifying interests: Hydrophilous Tall-Herb Swamp [6430] and Alluvial Woodland [91E0].

- The existing infestation of Himalayan balsam is actively being controlled by Carlow Council under a wider management and monitoring programme of invasive species within Carlow town. While no new emergence of Himalayan balsam was noted within the Park during 2021 surveys, the area will be regularly monitored and managed in accordance with current guidelines.
- It is recommended that butterfly-bush be removed from the riparian corridor of the Park in order to prevent further spread of this medium impact invasive species. Given the limited extent within the Park (See Figure 2), physical control would be suitable. Care must be taken to ensure all parts of the plant are removed as branches are capable of re-rooting from cuttings. Plants must not be removed when in seed to prevent spread of seeds.
- Where soils are required for development of any aspect of the development, clean soil will be imported from areas free of invasive non-native plant species such as Japanese knotweed, Himalayan balsam and giant hogweed as it is an offence to plant, disperse or allow dispersal of these non-native plants under the *European Communities (Birds and Natural Habitats) Regulations 2011.*

6 RESIDUAL IMPACTS & CONCLUSIONS

This NIS has been undertaken to evaluate the potential impacts of the proposed development of Hanover Activity and Bike Park, Carlow town with regard to the effects upon the conservation objectives and qualifying interests (including the habitats and species) of the River Barrow and River Nore SAC. It is considered that following mitigation, the proposed project does not have the potential to significantly affect the conservation objectives of this Natura 2000 site and the integrity of this site will not be adversely impacted. No residual effects will occur on the Natura 2000 network.

Signed:

_____

Lisa Dowling MCIEEM

Ecological Consultant

Date:7th April 2022

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APPENDICES

APPENDIX 1

HANOVER ACTIVITY AND BIKE PARK: PROPOSED LAYOUT

NOTES

1. This drawing is the property of Carlow County Council, it is a confidential document and must not be copied, used, or the contents divulged without prior written consent.
2. DO NOT SCALE, use figured dimensions only, if in doubt ask.

No.	Date	Amendment / Issue	Rev.
A	06/04/22	Issued for Comment	CDS

CARLOW COUNTY COUNCIL

CARLOW MUNICIPAL DISTRICT

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Carlow Local Authorities, A CPD Accredited Company

Project:

HANOVER ACTIVITY AND BIKE PARK

Title:

Proposed Layout

Drawn by:	Ciaran Brennan	Job No:	202201
Checked by:	Barry Keenan	Drw Loc:	My docs
Approved by:	Padraig O'Gorman	Dg. No:	4 of 4
Scale:	1:250 @ A1	Rev:	A
Date:	06/04/2022		

APPENDIX 2

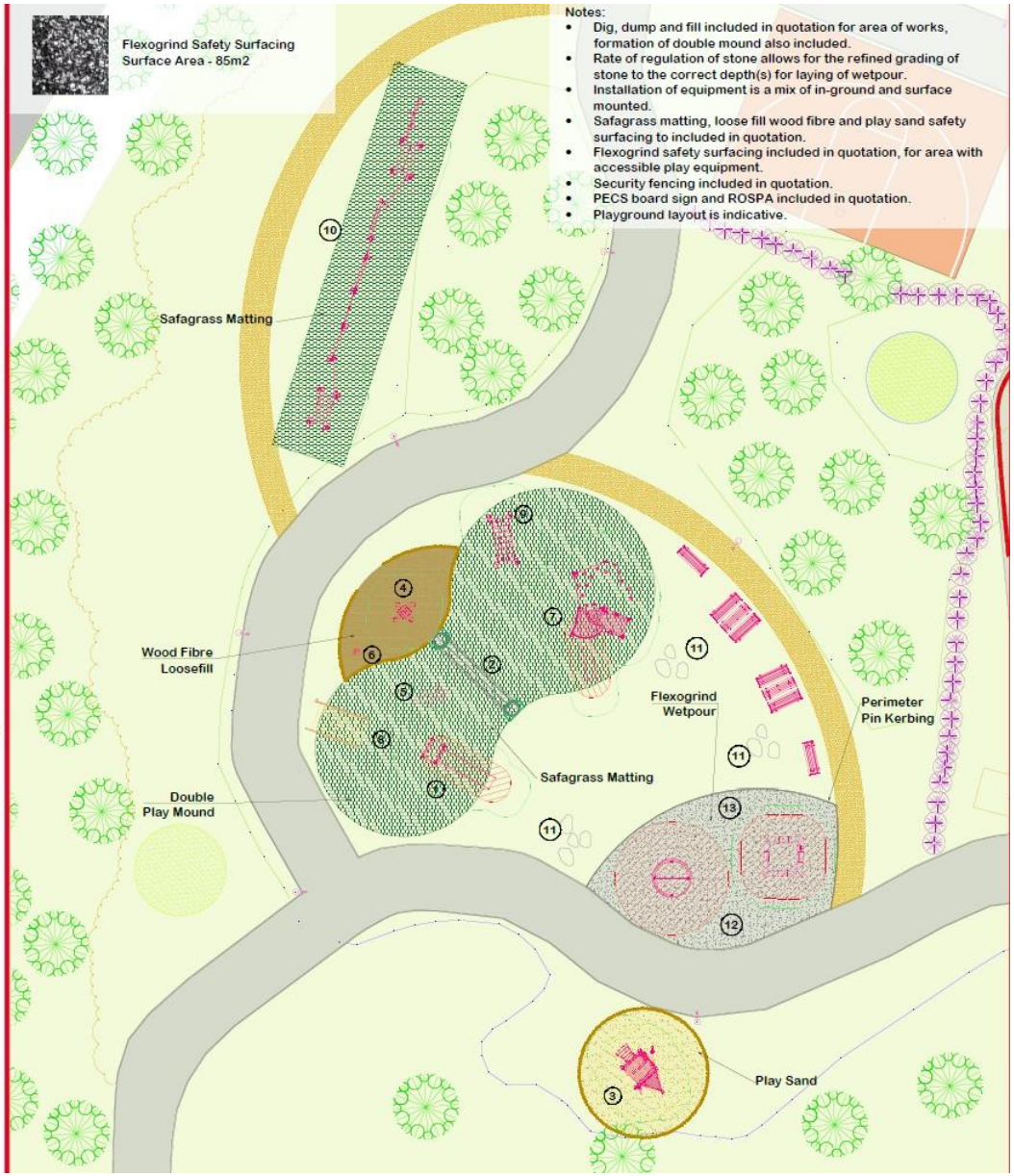
HANOVER ACTIVITY AND BIKE PARK: DETAILS OF PROJECT ELEMENTS

Equipment List

1. PCM110203 - Embankment Slide
2. IE-FIAGT60 - 6M Underground Tunnel
3. NRO530 - Oasis Sand Works
4. NRO212 - Seat Posts & Round Table
5. NRO518 - Oak Lizard Sculpture
6. NRO516 - Owl Sculpture
7. NRO703 - Play Hut with Stairway
8. Accessible Timber Steps
9. NRO631 - Balance Net
10. NRO865 - Agility Trail 6
11. Natural Play Boulders
12. PCM157 - Wheelchair Carousel
13. JUM10401 - Jumper Square, 1.5m x 1.5m

SIX PRINCIPLES FOR UNIVERSAL, INCLUSIVE DESIGN
PRODUCTS THAT ARE UNIVERSAL AND INCLUSIVE SHOULD BE:

1. Accessible
2. Multifunctional (when possible)
3. 360° design (play from all sides)
4. Equipped with diverse play opportunities
5. Clear in colour and design signals
6. Provided with special solutions for special needs when relevant



Notes:

- Dig, dump and fill included in quotation for area of works, formation of double mound also included.
- Rate of regulation of stone allows for the refined grading of stone to the correct depth(s) for laying of wetpour.
- Installation of equipment is a mix of in-ground and surface mounted.
- Safagrass matting, loose fill wood fibre and play sand safety surfacing to included in quotation.
- Flexogrind safety surfacing included in quotation, for area with accessible play equipment.
- Security fencing included in quotation.
- PECS board sign and ROSPA included in quotation.
- Playground layout is indicative.

3D Image of Bike Pump Track

Example of Completed Bike Pump Track (Night-time)

APPENDIX 3

DEVELOPMENT APPLICATIONS UNIT RESPONSE

An Roinn Turasóireachta, Cultúir,
Ealaíon, Gaeltachta, Spóirt agus Meán
Department of Tourism, Culture,
Arts, Gaeltacht, Sport and Media

Your Ref: Hanover Bike Park
Our Ref: G Pre00030/2021 (Please quote in all related correspondence)

Lisa Dowling
Ecological Consultant
Unit 8c
Enterprise House
O'Brien Road
Carlow

Via email: dowling_lisab@yahoo.com

Re: Re: Notification to the Minister, under the Planning and Development Act, 2000, as amended.

Re: EcIA for Proposed Activity and Bike Park at Hanover, Carlow Town

A chara

I refer to correspondence dated 2nd February received in connection with the above. Outlined below are heritage-related observations/recommendations co-ordinated by the Development Applications Unit under the stated headings.

Nature Conservation

The proposed development lies in close proximity to The River Barrow and River Nore candidate Special Area of Conservation (site code 002162), which is designated for a range of riverine species and habitats for which suitable water quality is required. The development has the potential to have a significant effect, either individually or in combination with other plans and projects, on this and other European sites of conservation importance. The Burren River is a major tributary of the Barrow River. Hanover Park has very regular Otter sightings, mostly in the hours of darkness at the Bridge at the Old Pennys carpark.

The introduction of additional lighting is of concern for otters, bat species and roosting birds. Given that the park is not in use at night we would suggest putting the lights on a timer and that lighting should be low level path lighting.

The design and sizing of the surface water drainage system must ensure that no suspended solids enter the Burren River, even during periods of prolonged heavy rainfall.

The activities proposed for this site are likely to result in significant lorry traffic to and from the site, with potential for the generation of significant suspended solids pollution in run-off

associated with this vehicular traffic. It is imperative that the potential for suspended solids pollution from road run-off from vehicles entering and leaving this site is addressed.

All riparian habitat should be undisturbed except for the removal of invasive species and a suitable buffer zone created. Before works commence on the site, the buffer zone should be fenced off to protect the riparian habitat. Silt fences should be constructed on the boundary of the buffer zone in order to control suspended solids emissions.

All waste oil, empty oil containers and other hazardous wastes are disposed of in conjunction with the requirements of the Waste Management Act 1996.

All fuel & oil tanks must adequately bunded. Refuelling of machinery must be carried out in bunded areas. No direct discharges will occur to the River Barrow.

Construction plant will be stored overnight off site.

Appropriate Assessment

Guidance

With regard to appropriate assessment (AA) and screening for AA, some Guidance documents are referred to below which may help. However CJEU case law has to some extent clarified certain issues and should be consulted. In particular case C-258/2011- N6 Galway City Outer Bypass is relevant as is the recent opinion on the Briels case, C-521/12 and Judgement of the 12/4/2018 — CASE C 323/17.

Guidance on AA is available in the Departmental guidance document on Appropriate Assessment, which is available on the NPWS web site at http://www.npws.ie/sites/default/files/publications/pdf/NPWS_2009_AA_Guidance.pdf and in the EU Commission guidance entitled "Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC" which can be downloaded from http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/natura_2000_assess_en.pdf
The local authority is advised that screening should be undertaken, and screening outcomes determined, without the inclusion of mitigation, which when required would indicate the need for Stage 2 Appropriate Assessment. See; "Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities."

https://www.npws.ie/protected-sites/guidance-appropriate-assessment-planning-authorities

Conservation objectives

In order to carry out the appropriate assessment screening, and/or prepare the Natura Impact Statement (NIS), information about the relevant Natura 2000 sites including their conservation objectives will need to be collected. Details of designated sites and species and conservation objectives can be found on www.npws.ie. Site-specific, as opposed to generic, conservation objectives are now available for some sites. Each conservation objective for a

qualifying interest is defined by a list of attributes and targets and is often supported by further documentation. Where these are not available for a site, an examination of the attributes that are used to define site-specific conservation objectives for the same QIs in other sites can be usefully used to ensure the full ecological implications of a proposal for a site's conservation objective and its integrity are analysed and assessed. It is advised, as per the notes and guidelines in the site-specific conservation objectives, that any reports quoting conservation objectives should give the version number and date, so that it can be ensured and established that the most up-to-date versions are used in the preparation of Natura Impact Statements and in undertaking appropriate assessments.

Where further detail is required on any information on the website www.npws.ie, a data request form should be submitted. This can be found at http://www.npws.ie/maps-and-data/request-data.

Cumulative and ex situ impacts

A rule of thumb often used is to include all Natura 2000 sites within a distance of 15km. It should be noted however that this will not always be appropriate. In some instances where there are hydrological connections a whole river catchment or a groundwater aquifer may need to be included. Similarly where bird flight paths are involved the impact may be on an SPA more than 15 km away.

Other relevant Local Authorities should be consulted to determine if there are any projects or plans which, in combination with this proposed development, could impact on any Natura 2000 sites

Alien invasive species

Given the site's location and involvement of movement and importation of growing media and spent growing media, care should be taken to avoid introduction or spread of invasive species which could impact negatively on these sites. Information on alien invasive species in Ireland can be found at http://invasives.biodiversityireland.ie/
and http://invasivespeciesireland.com/.

Licenses

Where there are impacts on protected species and their habitats, resting or breeding places, licenses may be required under the Wildlife Acts or derogations under the Habitats Regulations. In particular bats and otters are strictly protected under annex IV of the Habitats Directive and a copy of Circular Letter NPWS 2/07 entitled "Guidance on Compliance with Regulation 23 of the Habitats Regulations 1997 – strict protection of certain species/applications for derogation licences" can be found on the Departmental web site at http://www.npws.ie/sites/default/files/general/circular-npws-02-07.pdf . It should be noted however that this Regulation has been replaced by SI 477 of 2011 and that section 53 is the relevant section.

In addition licenses will be required if there are any impacts on other protected species or their resting or breeding places, such as on protected plants, badger setts or birds nests. Where possible hedges and trees should not be removed during the nesting season (i.e. March 1st to August 31st). Birds nests can only be intentionally destroyed under licence issued under the Wildlife Acts of 1976 to 2012.

In order to apply for any such licenses or derogations as mentioned above the results of a survey should be submitted to the National Parks and Wildlife Service of this Department. Such surveys are to be carried out by appropriately qualified person/s at an appropriate time of the year. Details of survey methodology should also be provided. Such licences should be applied for in advance of planning to avoid delays and in case project modifications are necessary.

Should the survey work take place well before construction commences, it is recommended that an ecological survey of the development site should take place immediately prior to construction to ensure no significant change in the baseline ecological survey has occurred. If there has been any significant change mitigation may require amendment and where a licence has expired, there will be a need for new licence applications for protected species.

In order to apply for any such licenses or derogations as mentioned above the results of a survey should be submitted to the National Parks and Wildlife Service of this Department which should have been carried out by appropriately qualified person/s at an appropriate time of the year. Details of survey methodology should also be provided. Such licences should be applied for in advance of planning to avoid delays and in case project modifications are necessary.

You are requested to send further communications to the Development Applications Unit (DAU) at **manager.dau@chg.gov.ie**, or to the following address:

The Manager
Development Applications Unit (DAU)
Government Offices
Newtown Road
Wexford
Y35 AP90

Is mise, le meas

Diarmuid Buttimer
Development Applications Unit

APPENDIX 4 PHOTOPLATES

Photoplate 1. View of park from entrance by Hanover Bridge in northwesterly direction.

Photoplate 2. View of park in northwesterly direction.

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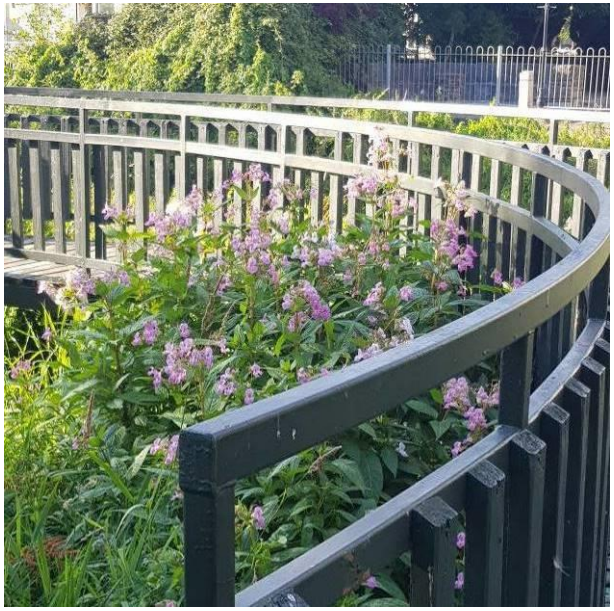
Photoplate 4. From Kilkenny Rd entrance in a northerly direction. Scattered Trees and Parkland (WD5) in the foreground.

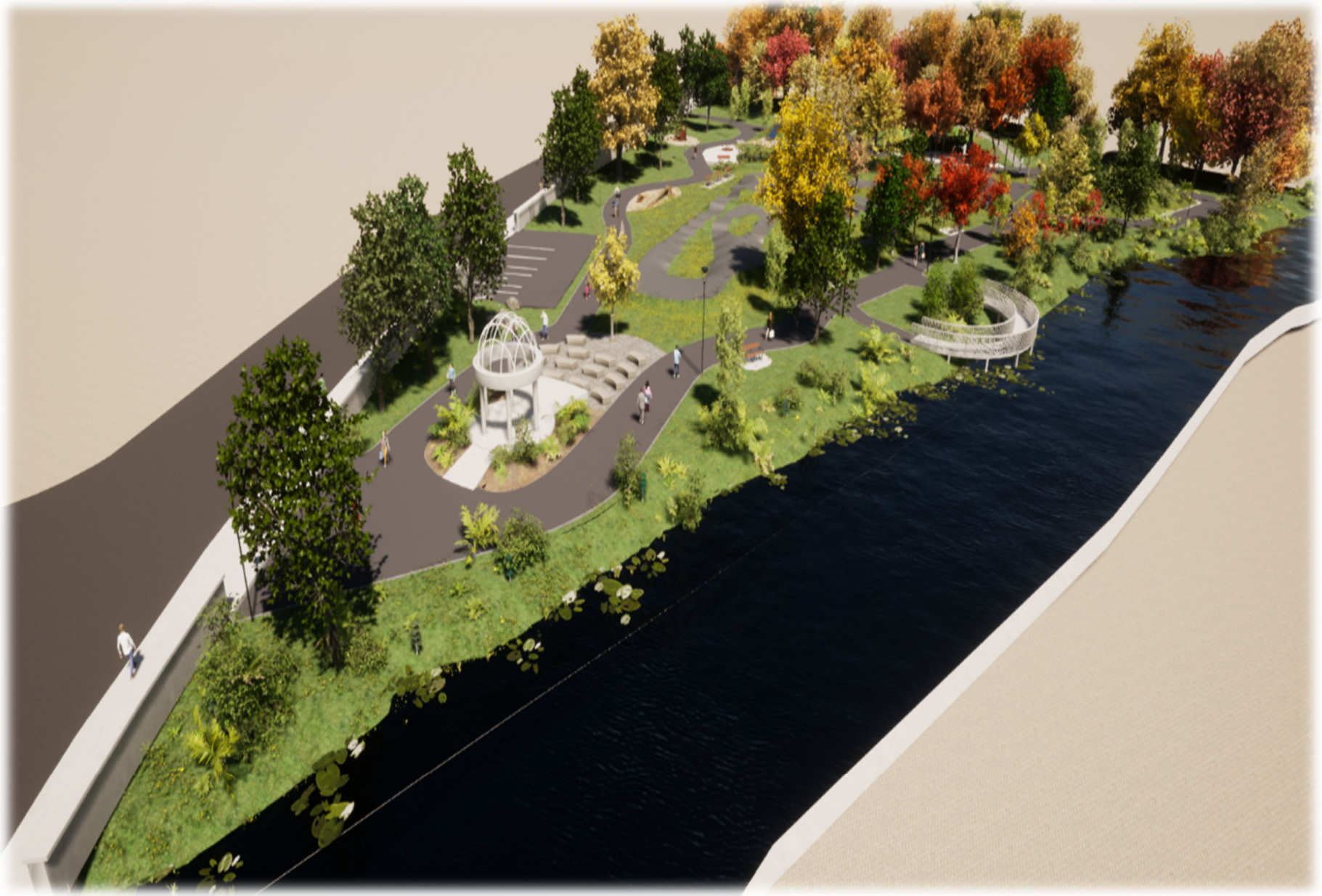
Photoplate 5. View of park from entrance on Kilkenny Rd in an easterly direction.

Photoplate 6. Scattered Trees and Parkland (WD5) by entrance from Penneys.



Photoplate 7. Himalayan Balsam (21/07/2020)

Photoplate 8. Treated Himalayan Balsam left in situ (23/04/21)



Appendix C – Ecological Impact Assessment

Carlow Municipal District

Hanover Activity & Bike Park,

Hanover, Carlow

ECOLOGICAL IMPACT ASSESSMENT

Version 2.0

7th April 2022

Lisa Dowling MCIEEM,

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Email: dowling_lisab@yahoo.com

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1 INTRODUCTION

Lisa Dowling MCIEEM was commissioned by Carlow Municipal District to prepare an Ecological Impact Assessment (EcIA) for Hanover Activity and Bike Park at Hanover in Carlow town centre This EcIA provides an assessment of the potential impacts of the proposal on the ecological environment i.e. flora and fauna, collectively known as biodiversity. The Report follows "Guidelines for Ecological Impact Assessment in the UK and Ireland" (CIEEM, 2018), and "Guidelines for Ecological Report Writing" (CIEEM, 2017). The EcIA process follows the tasks set out in Table 1.1.

Table 1.1 EcIA process

Task	Description
Scoping	Determining the matters to be addressed in the EcIA, including consultation to ensure the most effective input to defining the scope. Scoping is an ongoing process –the scope of the EcIA may be modified following further ecological survey/research and during impact assessment.
Establishing the baseline	Collecting information and describing the ecological conditions in the absence of the proposed project, to inform the assessment of impacts.
Important ecological features	Identifying important ecological features (habitats and species) that may be affected, with reference to a geographical context in which they are considered important.
Impact assessment	An assessment of whether important ecological features may be subject to potential impacts and characterisation of these impacts and their effects. Assessment of potential residual ecological impacts of the project remaining after mitigation and the significance of their effects, including cumulative effects.
Avoidance, mitigation, compensation, and enhancement	Incorporating measures to avoid, reduce and/or compensate potential ecological impacts, and the provision of ecological enhancements.
Monitoring	

(from CIEEM, 2018)

A Natura Impact Statement (NIS) has been prepared to specifically assess the potential impacts of the proposal on the River Barrow and River Nore Special Area of Conservation (SAC) a short distance downstream of Hanover Park. In order to reduce repetition, reference is made to the NIS where necessary.

Part 1 in Schedule 5 of the "Planning and Development Regulations" 2001 (as amended) defines mandatory projects that require an Environmental Impact Assessment Report (EIAR), and Part 2 of the same schedule defines projects that are assessed on the basis of set mandatory thresholds for each of the project classes. The proposed development does not come within the scope of any of the mandatory projects that require mandatory EIAR in Part 1 or Part 2 of Schedule 5.

Having regard to the nature and scale of the proposed development it is considered that there is no real likelihood of significant effects on the environment arising from the proposed development. The need for EIA can therefore be excluded at preliminary examination, and for this reason an EIA screening determination is not required.

Statement of Authority

Fieldwork and reporting were undertaken by Lisa Dowling who has over sixteen years environmental consultancy experience, specialising in the areas of Ecological Impact Assessment and Appropriate Assessment. She obtained an honours degree in Applied Ecology in 1995 from University College Cork; a master's degree in Environmental Resource Management in 1997 from University College Dublin; and a Certificate in Biological Recording and Species Identification from University of Birmingham in 2005. She is a full member of the professional body, the Chartered Institute of Ecology and Environmental Management (CIEEM) since 2006 and is nominated vice-county recorder of the Botanical Society of Britain and Ireland (BSBI) for County Carlow. She holds full professional indemnity insurance.

2 PROJECT DESCRIPTION

The design of this urban park development has a strong emphasis on wildlife, biodiversity and natural play areas, all within an urban town centre location. The project area encompasses an existing town park adjacent to the former Penney's carpark and the River Burren, on a site of c. 0.95ha. The existing habitats, trees, shrubs and topography have been incorporated in the overall design of the project as far as possible. Artificial surfaces will be predominantly permeable in nature offsetting the necessity for formal drainage proposals. The expected construction timeframe would be approximately four months, with hours of operation from 7am to 7pm Monday to Friday.

For further details of the project, see Proposed Layout in Appendix 1. The proposal includes the following elements:

- Playground (c. 515m^2). Construction of the playground will include excavation for the installation of safegrass matting, loose fill wood fibre, flexogrid safety surfacing and play sand safety surfacing as per Playground Plan included in Appendix 2. Two small double mounds will be formed with suitable imported fill material and safegrass matting will be placed on the imported fill material. Play equipment will be as detailed in Playground Plan in Appendix 2.
- Bike pump track (c. 877m^2). Imported fill material will be used to create the rolling hills of the pump track. A layer of crushed stone (Cl 804) will be placed on the imported fill and the crushed stone will then be finished with a layer of macadam. The proposed pump track will have a wildlife theme with native plants / trees. See pump track examples in Appendix 2.
- Accessible carpark (c. 219m^2) comprising 4 No. car spaces.
- Biodiversity garden (c. 124m^2) including shallow wildlife pond (it is not envisaged that this pond will connect with the River Burren).
- New 3.5m wide accessible footpaths linking the accessible car park to the playground and encircling the biodiversity garden. Works will involve striping of soils to c. 15cm depth, laying terram, followed by 804 crushed aggregate and c. 50/60mm of macadam surface.

- Wildlife buffer zone. This area will encompass 10m setback from the River Burren and will remain undeveloped.
- Mini basketball court (c. 140m^2)
- 12 No. new lighting columns (6m in height) will provide illumination along the new footpath, at the pump-track and at the play area. Further details of the proposed lighting scheme are included in Enerveo's Outdoor Lighting Report (2022) for Hanover Park, and Environmental Impact of Lighting Scheme upon Bats: Hanover Park, Carlow Town (Molloy, 2022).
- Cycling skills feature
- Age friendly seating & picnic benches
- Planting of native trees and plants

All works will be undertaken in accordance with a Construction Environmental Management Plan (CEMP) compiled by Carlow County Council.

3 METHODOLOGY

3.1 Scoping

The aim of this assessment is to identify any ecological features that may pose a constraint to the proposed development. It involves the following steps:

- Identification of designated sites within an appropriate zone of influence.
- Review of existing biological records for the proposed site and surroundings.
- Field assessments including habitat, botanical and faunal surveys.
- Valuation of ecological features, review of legal considerations, and selection of important ecological features.
- Assessment of impacts on important ecological features and development of appropriate mitigation measures where required.

3.1.1 Designated Sites

The River Barrow and River Nore SAC (Site Code: 002162) is located c.600m downstream of the proposed site where it includes the main channel of the River Barrow (See Figure 1). No direct effects will be incurred on the SAC. A Natura Impact Statement (NIS), which accompanies this EcIA, was prepared to identify and evaluate potential impacts on the nearby Natura site. The NIS concluded that, with the implementation of mitigation measures, the proposal would have no significant residual effects on the nearby SAC either alone or cumulatively.

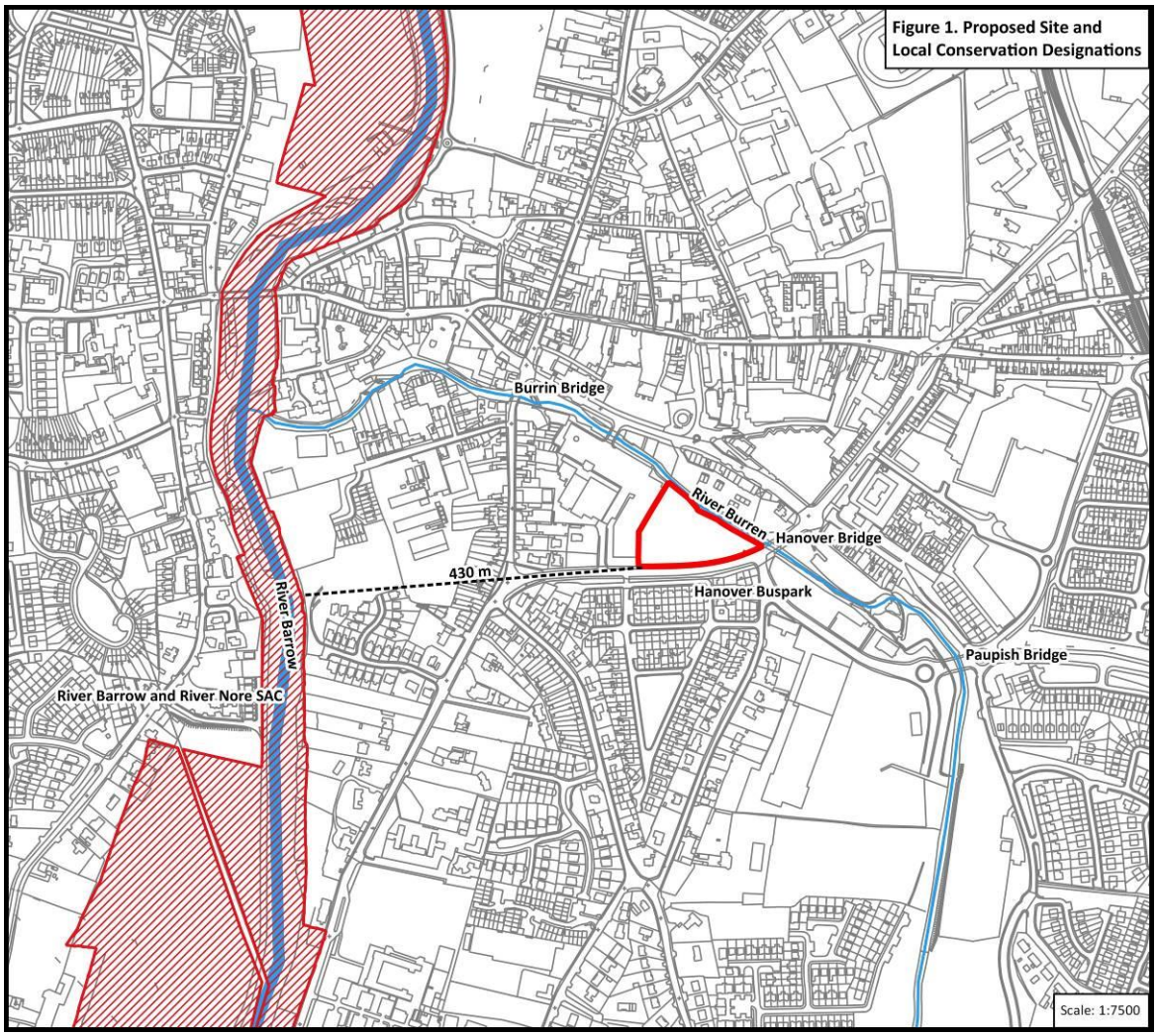
3.2 Desk Study

3.2.1 Legislation

The following National and EU wildlife legislation details levels of habitat and species protection, as well as information pertaining to invasive species requiring control and eradication.

- "Habitats Directive" (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna);
- "Birds Directive" (Council Directive 2009/147/EC on the Conservation of Wild Birds);

- Water Framework Directive (WFD) 2000/60/EC provides a framework for the protection and improvement of rivers, lakes, marine and ground waters in addition to water dependent habitats;
- Wildlife Acts of 1976 and 2000, as amended;
- European Communities (Bird and Natural Habitat) Regulations 2011 and 2015; and
- Flora (Protection) Order, 2015.



3.2.2 Environmental Data Search

A desk-based study was carried out using data from the following sources:

- Plans and specifications for the proposed development;
- Consultation with Development Applications Unit and Inland Fisheries Ireland;
- Review of data and literature on rare/protected species, and designated sites, held online by the NPWS (www.npws.ie), the NBDC (www.biodiversityireland.ie), BSBI (https://database.bsbi.org/), and Inland Fisheries Ireland;
- Carlow Town Biodiversity Strategy and Action Plan 2021-2025 (Scott Cawley, 2021).

3.3 Field Surveys

3.3.1 Habitat Survey

A habitat survey of the proposed site was undertaken (10/12/2020; 05/02/21 and 24/04/21) in accordance with habitat assessment guidelines issued by Fossitt (2000) and Smith *et al.* (2011). An additional walkover of the site was undertaken on March 1st 2022 in order to update habitat mapping undertaken in 2021. As the majority of habitat types are classified based on their botanical composition, the best time for carrying out habitat surveys is the period from April through September, the growing season for most plants. Given that the habitat survey was undertaken early in the survey season, it is likely that several plant species will have been overlooked. Nevertheless, in the context of the urban environment in which the proposed site is located, sufficient data was collected to accurately assess habitats present. Plant nomenclature follows Stace (2019). Invasive non-native plant species were also recorded where observed.

3.3.2 Faunal Surveys

Protected mammal surveys were undertaken on 05/02/2021 following guidance found in NRA documentation, "*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*". The proposed site and its boundaries were searched for signs of protected mammals such as droppings, footprints, tracks and burrows. In addition, the Burren River was surveyed for a stretch from Burrin Bridge to Paupish Bridge (680m distance) scanning the banks for signs of otter such as spraints (droppings), prints, food signs, slides, couches and holts.

Birds observed or heard during habitat, mammal and botanical surveys within the proposed site and along its boundaries were documented. This information was enhanced by assessing the potential for habitats present to provide nesting habitat for bird species with known records in the locality and defined as 'medium' or 'high' conservation concern by Gilbert *et al.* (2021).

3.4 Valuation of Ecological Features

The importance of ecological features identified within the zone of influence of the development were evaluated within the following geographic frame of reference devised by NRA (2009):

- International and European;
- National;
- Regional;
- County;
- Local Importance (High Value); and
- Local Importance (Low Value).

As per NRA (2009) and CIEEM (2018) guidelines, 'important ecological features' were considered to be sufficiently valuable to the decision-making process, specifically of 'Local Importance (Higher Value)' or higher and were carried forward into the assessment of potential impacts. Ecological features valued at 'Local Importance (Lower Value)' or of negligible value were not considered significant features and were scoped out of impact assessment. As discussed in Section 3.1.1, the nearby River Barrow and River Nore SAC was given full consideration within the accompanying NIS and was not considered within this EcIA.

3.5 Impact Assessment Process

The impact assessment process involves identifying and characterising impacts and their effects on each feature identified as 'important'. Potential direct, indirect or cumulative impacts on ecological features can be characterised in relation to their magnitude, extent, duration, reversibility and timing/frequency, as outlined in the CIEEM (2018) guidelines. An impact will be determined as significant depending on the type of effect and the sensitivities of the important ecological feature. In terms of definitions for 'significance', the following definitions are provided in CIEEM guidelines: "*For the purposes of EcIA, a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general." "A significant effect is simply an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project."* Where significant impacts are identified, measures will be taken to avoid, minimise or compensate for impacts. Based on these measures, the impact assessment will be repeated, and any residual impacts will be discussed and assessed for significance.

4 RECEIVING ENVIRONMENT

4.1 Environmental Setting

The proposed site comprises the existing park at Hanover within the urban environment of Carlow town. The site is a triangular shape, with the northern side bordering the River Burren. Commercial premises with associated carpark and residential developments are situated on the far bank. The southern site boundary runs along the Kilkenny Road with residential development and Aldi carpark situated on the far side. The western site boundary borders a large carpark formerly occupied by Penney's retail.

The River Burren flows westward for c. 600m before its confluence with the River Barrow and River Nore SAC where it includes the riparian channel of the River Barrow.

For the purposes of the WFD, the adjacent watercourse is named Burren_60. Burren_60 achieved 'moderate' status during the 2015-2018 monitoring period which was an improvement on the 'poor' status reported during the previous period 2010-2015. Water body quality status for the majority of the Burren sub-catchment was reported as 'moderate' status during the 2015-2018 monitoring period (WFD, 2019).

The qualifying interests of the River Barrow and River Nore SAC and their known occurrences within the River Burren is discussed further in the accompanying NIS.

4.2 Desktop Study

4.2.1 NBDC Records

Records of flora and fauna in the vicinity of the proposed development site (10km grid square S77) were obtained from the NBDC database. These records which were filtered for protected and rare species are provided in Appendix 3.

4.2.2 Consultation Responses

A response from the DAU was received on 19th March 2021 (See full response in Appendix 3 of NIS). Their chief concerns are summarized below:

- The development has the potential to have a significant effect, either individually or in-combination with other plans and projects on the River Barrow & River Nore SAC.

- Hanover Park has very regular Otter sightings, mostly during the hours of darkness at the bridge at the Old Penny's carpark.
- The introduction of additional lighting is a concern for otters, bat species and roosting birds. The NPWS suggest putting any lighting on a timer and that lighting should be low level path lighting.
- The potential for suspended solids pollution from road run-off from vehicles entering and leaving this site during development should be addressed.
- All riparian habitat should be undisturbed, except for the removal of invasive species. A suitable buffer zone should be created. Silt fences should be constructed on the boundary of the buffer zone in order to control suspended solids emissions.
- Care should be taken to avoid introduction or spread of invasive species which could impact negatively on these sites.

No response received from IFI 04/03/2022.

4.3 Field Survey Findings

4.3.1 Habitats and Flora

Habitat Assessment

7 No. habitat types were identified within the proposed site and are presented on Figure 2. They are as follows:

- Improved Amenity Grassland (GA2)
- Scattered Trees and Parkland (WD5)
- Mixed Broadleaved Woodland (WD1)
- Buildings and Artificial Surfaces (BL3)
- Wet Grassland (GS4)
- Treelines (WL2)
- Depositing/Lowland River (FW2)

<u>Improved Amenity Grassland (GA2)</u>

The proposed site largely comprised a relatively short mown sward of Improved Amenity Grassland (GA2) with abundant perennial rye-grass *Lolium perenne*, and occasional Yorkshire fog *Holcus lanatus,* cock's-foot *Dactylis glomerata* and red fescue *Festuca rubra*. The broadleaved herb component was generally low to moderate and included common forbes such as creeping buttercup *Ranunculus repens*, ribwort plantain *Plantago lanceolata*, cleavers *Galium aparine*, daisy *Bellis perennis*, red dead-nettle *Lamium purpureum,* common nettle *Urtica dioica* and *Geranium* spp.

Indicators of underlying base-rich soils were frequent throughout and included yarrow *Achillea milleafollium*, self-heal *Prunella vulgaris*, common knapweed *Centuarea nigra* and cat's-ear *Hypochaeris radicata*.

Small areas of bare ground included annual meadow-grass *Poa annua*, groundsel *Senecio vulgaris,* common chickweed *Stellaria media*, spear-thistle *Cirsium vulgare* and red bartsia *Odontites vernus.*

A line of Chinese bramble *Rubus tricolor* has become established along the riverbank at the western end of the site. Patches of daffodil *Narcissus* agg. occurred within this habitat close to

the riverbank. Several young birch trees were planted along the edge of this habitat type during 2021.

Scattered Trees and Parkland (WD5)

A number of small areas of this habitat type occurred throughout the park. This habitat type was characterised by planted native tree species and non-native cultivars of varying ages. This category is used in situations where scattered trees, standing alone or in small clusters, cover less than 30% of the total area under consideration but are a prominent structural or visual feature of the habitat (Fossitt, 2000). Tree species composition was variable within the park. Scot's pine *Pinus sylvestris* was dominant or co-dominant with silver birch *Betula pendula* in the examples of this habitat on the western part of the site. Alder *Alnus glutinosa* together with willow *Salix* sp. or ash *Fraxinus excelsior* along with Norway maple *Acer platanoides* formed groupings adjacent to the river. A small grouping of low-growing ornamental hawthorn *Crataegus* sp. with one horse-chestnut *Aesculus hippocastanum* occurred near to the bandstand.

One example of this habitat type had a wood chip treatment planted with daffodils and other bulbs, while another example was maintained as Improved Amenity Grassland (GA2) beneath the canopy. A longer sward was allowed to develop on uneven ground by the river where common broadleaved herbs dominated the sward. Cow-parsley *Anthriscus sylvatica,* a garden escape *Geranium* sp., ground-elder *Aegopodium podagraria* and lords-and-ladies *Arum maculatum* were found in damper ground at this location.

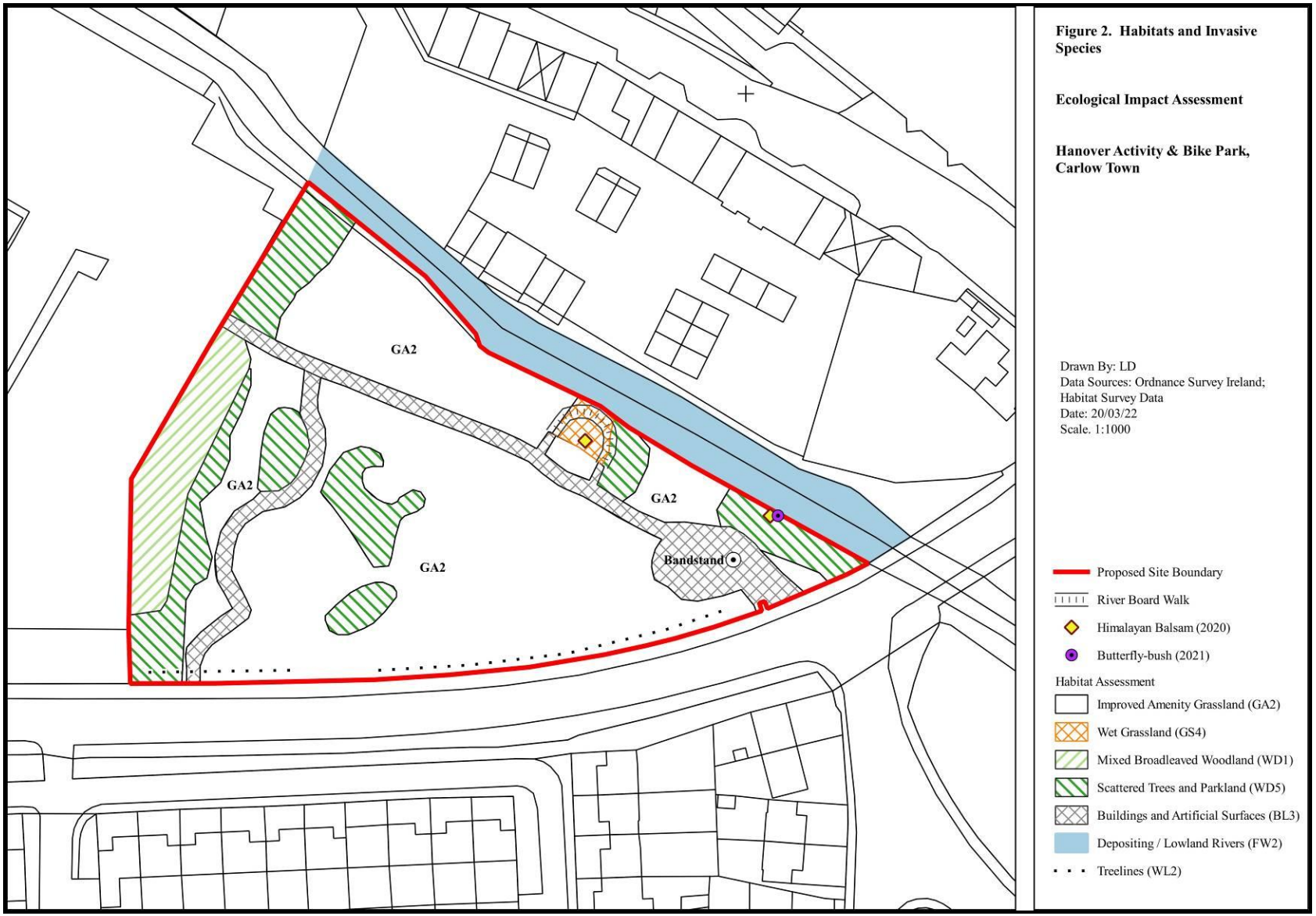
Mixed Broadleaved Woodland (WD1)

A narrow strip of Mixed Broadleaved Woodland (WD1) was located along the edge of Penney's carpark. This habitat type was characterised by native and non-native semi-mature trees and shrubs. The canopy was more closed relative to the "Scattered Trees and Parkland" habitat and featured layering of woody plants typical of woodland habitat. The habitat was dominated by Norway maple, several mature elder *Sambucus nigra* and frequent Scot's pine. The understorey/shrub layer comprised rowan *Sorbus aucuparia*, *Cotoneaster* sp., Norway maple, sycamore *Acer pseudoplatanus* and elder regeneration, willow and currant *Ribes* sp. The ground flora was co-dominated by ground-elder and ivy *Hedera hibernica* with occasional bluebell *Hyacinthoides non-scripta.*

Buildings and Artificial Surfaces (BL3) included macadam footpaths and pedestrian entrance beside Hanover Bridge, as well as the outdoor classroom which comprised resin-bound surfacing on macadam. This habitat type also included the bandstand beside the outdoor classroom.

Wet Grassland (GS4)

A small patch of Wet Grassland was found adjacent to the river where the ground has a natural gradient down towards the river and extends under a semi-circular raised walkway. This habitat comprised a tall sward of grasses including reed canary-grass *Phalaris arundinacea* and cock's-foot *Dactylis glomerata*, as well as common herbs such as common nettle, broad-leaved dock *Rumex obtusifolius*, creeping buttercup and occasional lesser celandine *Ficaria ficaria*, hogweed *Heracleum sphondylium* and cow-parsley. Himalayan balsam *Impatiens glandulifera* was recorded within this habitat type beside the board walk in 2020 (See Section 4.3.3 for further details).


GA2
GA2
GA2
GA2
Bandstand
Figure 2. Habitats and Invasive Species
Ecological Impact Assessment
Hanover Activity & Bike Park, Carlow Town
Drawn By: LD
Data Sources: Ordnance Survey Ireland; Habitat Survey Data
Date: 20/03/22
Scale. 1:1000
Proposed Site Boundary
River Board Walk
Himalayan Balsam (2020)
Butterfly-bush (2021)
Habitat Assessment
Improved Amenity Grassland (GA2)
Wet Grassland (GS4)
Mixed Broadleaved Woodland (WD1)
Scattered Trees and Parkland (WD5)
Buildings and Artificial Surfaces (BL3)
Depositing / Lowland Rivers (FW2)
Treelines (WL2)

Treelines (WL2)

A line of trees growing to c.10m in height occurred inside a low wall along the southern site boundary. This habitat comprised silver birch, Norway maple and Oak *Quercus* sp. A combination of non-native ornamental shrubs such as garden privet *Ligustrum ovalifolium* and Chinese bramble were prolific along the base of the treeline in places. These shrubs were planted as part of former landscaping of the Park but have become unmanaged and overgrown. The native shrub gorse *Ulex europaeus* was also found within this habitat type.

Depositing/Lowland Rivers (FW2)

The River Burren bounds the proposed site to the north. The river along this stretch, ranged from c.8m to 12m in width, and was heavily modified, with a vertical walled bank along the site side and a reprofiled far bank. The channel bed for the most part was uniform and comprised mainly finer sediments, with lesser amounts of gravels. Gravels, cobbles and boulders were more frequent towards Hanover Bridge. Water depths ranged from c.30-100cm. Pondweed *Potamogeton pectinatus* was prevalent within the river near to Hanover Bridge. Tall emergents such as common club-rush *Schoenoplectus lacustris* and branched bur-reed *Sparganium erectum* were occasional mid-channel further downstream, with reed canary-grass and water-cress *Nasturtium* sp. occasionally occurring along the edge.

Adjacent Habitats

Buildings and Artificial Surfaces (BL3) habitat was the dominant habitat in adjacent areas given the urban environment of the proposal. The carpark of the former Penney's premises bordered the park to the west, while Kilkenny Rd and residential development bordered the site to the south. Overgrown trees and shrubs of an enclosed derelict garden at the far side of the river beside Hanover Bridge provided good nesting habitat for birds and other wildlife.

Rare and Protected Flora

No rare or protected plants, including the species listed in Appendix 3, were encountered during field surveys nor are expected to occur within the proposed site given the suite of habitats present.

4.3.2 Fauna

Terrestrial Mammals

No evidence of any protected mammals including Otter was found during any of the field surveys undertaken for the preparation of this report. Table 4.1 presents local mammal records obtained from the NBDC database and collected for the Carlow Town Biodiversity Strategy and Action Plan (Scott Cawley, 2021).

While the above records for Otter pertain to the adjacent Burren at Hanover Bus Park and nearby weir, this species is known to frequent Hanover Park (See Section 4.2.2) and occurs regularly along the River Burren. As a qualifying interest of the neighbouring SAC, the occurrence of Otter along the River Burren and River Barrow is discussed further in the NIS.

The recent bat survey undertaken for the Biodiversity Strategy and Action Plan for Carlow Town recorded three bat species in the Hanover Park area. These included Leisler's bat, the Common Pipistrelle, and the Soprano Pipistrelle. Bat calls were most frequent around the trees in the western part of the proposed site, and along the River Burren. Soprano Pipistrelles were recorded feeding over the river. A number of these were observed flying under the bridge, where there was little to no lighting. Their survey concluded that while the bridge may have potential roosting habitat, the trees in the park did not have any potential bat roost features (Scott Cawley, 2021).

Records for other protected mammals in neighbouring monads are Pine Marten *Martes martes* (S7277) and Hedgehog *Erinaceus europaeus* (S7277 and S7376). Both species are protected under the Wildlife Acts, and Annex V of the Habitats Directive affords protection to the Pine Marten.

Records for both Fox *Vulpes vulpes* and Grey Squirrel *Sciurus carolinensis* are available for neighbouring monad S7377. Both species are common and widespread in Ireland and do not receive any legal protection. Grey Squirrel is a scheduled invasive species under the *EC (Birds and Natural Habitats) Regulations 2011.*

While no direct evidence or sightings of any of these species was observed during surveys, given the suite of maintained and long grassland habitats, as well as areas of scrub, the proposed site is likely to support occasional foraging Foxes, Grey Squirrel and Hedgehog.

Table 4.1 Desktop Records for Proposed Site and Surrounding Area

Species	Data Source	Location/Grid Reference	Year	Legislation	Irish Status*
Brown Long-eared Bat (*Plecotus auritus*)	NBDC	S721765	2013	EU Habitats Directive (Annex II and Annex IV); Wildlife Acts	Least Concern
Common Pipistrelle (*Pipistrellus pipistrellus sensu lato*)	NBDC	S721765	2013	EU Habitats Directive (Annex II and Annex IV); Wildlife Acts	Least Concern
Common Pipistrelle (*Pipistrellus pipistrellus*)	BAP	Hanover Park	2020	EU Habitats Directive (Annex II and Annex IV); Wildlife Acts	Least Concern
Daubenton's Bat (*Myotis daubentonii*)	NBDC	S721765	2013	EU Habitats Directive (Annex II and Annex IV); Wildlife Acts	Least Concern
Leisler's Bat (*Nyctalus leisleri*)	BAP	Hanover Park	2020	EU Habitats Directive (Annex II and Annex IV); Wildlife Acts	Near Threatened
Otter (*Lutra lutra*)	NBDC	S724763; S724762	2014; 2014	EU Habitats Directive (Annex II and Annex IV); Wildlife Acts	Near Threatened
Soprano Pipistrelle (*Pipistrellus pygmaeus*)	BAP	Hanover Park	2020	EU Habitats Directive (Annex II and Annex IV); Wildlife Acts	Least Concern
Brown Rat (*Rattus norvegicus*)	NBDC	S723763	2012	Regulation S.I. 477 (Ireland)	Invasive Species

*Irish status as per Marnell *et al.,* 2009

Birds

A pair of Grey Wagtail *Motacilla cinerea* were observed flying under Hanover Bridge and along the eastern end of the River Burren at the park. This is a red-listed species of 'high' conservation concern as denoted by Gilbert *et al.* (2021). One amber-listed bird species of 'medium' conservation concern, namely, House Sparrow *Passer domesticus*, was recorded during field surveys. Other green-listed species of 'least' conservation concern observed within the site included Robin *Erithacus rubecula*, Blackbird *Turdus merula*, Chaffinch *Fringilla coelebs*, Hooded Crow *Corvus cornix*, Great Tit *Parus major*, Jackdaw *Corvus monedula*, Magpie *Pica pica*, Rook *Corvus frugilegus*, Song Thrush *Turdus philomelos* and Woodpigeon *Columba palumbus.*

The broadleaved woodland, scattered trees, treeline and associated scrub, and unmanaged habitats present within the proposed site has the potential to support nesting sites and foraging habitat for the above species and many red or amber-listed passerines and raptors recorded within the general area within the last ten years (See Appendix 3).

All birds (including nests, eggs and chicks) receive protection under the Wildlife Act 1976 (as amended).

4.3.3 Non-Native Invasive Species

Two records for the restricted invasive species Himalayan balsam *Impatiens glandulifera* (as listed on the third schedule the "European Communities (Birds and Natural Habitats) Regulations 2011)" were reported in Hanover Park in 2020; adjacent to the river board walk and adjacent to the River Burren near Hanover Bridge (Scott Cawley, 2021) (See Figure 2). Butterfly-bush was recorded along the riverbank near to Hanover Bridge during the habitat assessment for this EcIA. While not a scheduled species, this non-native plant is regarded as medium risk as it can form dense stands, outcompeting native species. All non-native invasive species recorded during field surveys and their potential impacts and mitigations are discussed further in the NIS.

4.4 Potential Limitations and Information Gaps

The optimal time period for undertaking habitat surveys falls between April and September (Smith *et al.*, 2011). While the habitat assessment was partially undertaken in April, it is still early in the survey season and so certain species have yet to develop their identification traits (such as grasses). In addition, the full extent of some plants may change as the field season progresses. Nevertheless, sufficient botanical data was collected to accurately determine and evaluate habitats present. No rare or protected plant species were encountered or are expected. Invasive species information was supplemented with available records for the proposed site and surrounding area. Mammal surveys were undertaken during the optimal period. Bird data collected was supplemented using local records. On this basis the assessment does not have any limitations or information gaps.

4.5 Identification of Important Ecological Features

Table 4.2 provides a summary of all ecological features identified on the site, including their valuation and legal / conservation status. For the purposes of this impact assessment, any features that are identified as of at least local ecological value (Higher Value), or that receive legal protection, are considered to be 'important ecological features', and will be addressed in the impact assessment.

Table 4.2 Identification of 'Important Ecological Features' within the Project's Zone of Influence

Ecological Feature	Valuation	Legal Status	Important Feature?	Potentially Significantly Impacted
River Barrow and River Nore SAC	International Importance	HD	Yes	Yes
Improved Amenity Grassland (GA1)	Negligible Importance	-	No	Yes
Scattered Trees and Parkland (WD5)	Local Importance (Higher Value)	-	Yes- secondary for fauna.	Yes
Mixed Broadleaved Woodland (WD1)	Local Importance (Higher Value)	-	Yes- secondary for fauna.	No
Wet Grassland (GS4)	Negligible Importance	-	No	No
Buildings and Artificial Surfaces (BL3)	Negligible Importance	-	No	No

Ecological Feature	Valuation	Legal Status	Important Feature?	Potentially Significantly Impacted
Treelines (WL2	Local Importance (Higher Value)	-	Yes- secondary for fauna.	Yes
Depositing/Lowland Rivers (FW2)	Local Importance (Higher Value)	-	Yes- secondary for fauna.	Yes
Bats	Local Importance (Higher Value)	WA, HD	Yes	Yes
Otters	International Importance	WA, HD	Yes	Yes
Other protected mammals	Local Importance (Higher Value)	WA	Yes	Yes
Birds	Local Importance (Higher Value)	WA	Yes	Yes

WA - protected under Section 19 or 20 of the Wildlife Act 1976 (as amended); HD – protected under EU Habitats Directive.

In summary, the important ecological features identified within the Zone of Influence of the development are the River Barrow and River Nore SAC, Mixed Broadleaved Woodland, birds, bats, Otters and other protected mammals. 'Treelines' and 'Scattered Trees and Parkland', given their scarcity in the local area, and as potential nesting and foraging habitat for birds and small mammals, are also considered to be important ecological features.

Potential impacts on the River Barrow and River Nore SAC and on its qualifying interests (including Otter) are fully examined in the accompanying NIS.

5 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

Potential impacts of the proposed development on the water quality of the adjacent River Burren and potential introduction and spread of non-native invasive species are discussed in full in Section 4.2 of the NIS, especially with reference to potential adverse effects on the downstream River Barrow and River Nore SAC and its qualifying interests.

5.1 Protections inherent in the Proposed Development

The proposed design endeavoured to incorporate and enhance natural topography and habitats where possible, to create an amenity beneficial to local wildlife and people alike. Several design features are of specific benefit to wildlife, including the following:

- A 10m wide streamside riparian zone will run alongside the River Burren which is broadly in line with the IFI's "*Guidelines on Planning for Watercourses in the Urban Environment*" (IFI, 2020).
- All trees will be retained as part of this proposal. The woodland areas and scattered trees habitats along the western boundary will be enhanced by additional planting of trees and shrubs.
- Proposed wildflower and biodiversity garden areas. This area will incorporate a raised shallow wildlife pond (the pond will not be connected with the River Burren).

5.2 Potential Impacts on Habitats

- The existing habitats, trees, shrubs and topography have been incorporated into the design of the Park as far as possible. It is not planned to remove any trees as part of this proposal.
- The following adverse effects may be incurred during works which may lead to ill health and potentially death of mature trees occurring as individual trees and in Treeline and Scattered Trees habitats:
  - Damage to main stem and crown;
  - Compaction of the ground in the vicinity of the roots;
  - Alteration of ground levels around the tree;
  - Covering the soil around the tree with an impermeable layer; and
  - Physical severance of structural roots.
- The Scattered trees in the vicinity of the Proposed Pumptrack and Play Area and the Treeline adjacent to the Proposed Carpark are the most vulnerable to such effects.
- There may removal of scrub at the western side to permit development of the footpath, however this is expected to be minimal.
- Potential negative impacts on habitats are not deemed to be significant overall.
- The design of the Park gives scope for management for biodiversity during its operation. Section 6 includes several measures recommended to enhance the Park for wildlife and pollinators.

5.3 Impacts on Fauna

5.3.1 Removal or Disturbance of Nesting / Breeding Places

- It is not planned to remove any trees as part of this proposal. Minimal scrub may be removed at the western side to permit development of the footpath. If this is cleared during the bird-nesting season (from 1st March and 31st August, inclusive), it is possible that active bird nests could be destroyed. The killing of any protected fauna or disturbance of their breeding / resting places would constitute an offence under the Wildlife Act 1976.

5.3.2 Light Disturbance

As the trees in the Park do not have any potential bat roost features, the proposed lighting scheme will not adversely impact roosting bats.

Potential adverse impacts on bats relate to potential modification of foraging behaviour particularly around the trees in the western part of the Park. Many night-flying insects are attracted to lights especially those lamps that emit UV light. A single source of light in a dark area can cause local insect populations to swarm in high densities around the light source. While some Irish bat species such as Leisler's bats will opportunistically feed on such insect swarms, most Irish bats are too sensitive to such light sources and suffer from insect numbers being reduced in traditional feeding areas. Furthermore, artificial lighting can increase the risk of bats being preyed on (BCI, 2010). Artificial lighting has been shown to be particularly harmful if used along river corridors, near woodland edges and near hedgerows (BCT, 2018).

All existing lighting columns are 6m in height and have LED luminaires which do not emit UV light. Lighting columns are setback at least 10m from the bank of the River Burren which reduces light spill along the riparian corridor, minimising negative impacts on foraging and commuting bats, otters and other wildlife.

The proposed lighting scheme will include 12 additional lighting columns as part of the proposed works. P4 lighting class (per BS EN 5489-1: 2020) has been selected to balance the requirements for safety and a sense of security within the urban park with requirements for wildlife. This scheme has a 5 Lux average value and 1 Lux minimum value. The Horizontal Illuminance model produced by Enerveo (2022) indicates

main illumination from the proposed scheme will be concentrated at the play area and at the path junction near Penney's entrance.

The following bat-friendly measures have been included in the lighting scheme:

- Proposed light columns will be 6m in height which falls below the 8m maximum specified by BCI (2010) and will help to reduce light spill.
- LED-type lanterns, of the 'warm white' type, have been specified, with a colour temperature of 2,700K. This is in accordance with BCT recommendations which cites research indicating that warmer colour temperatures with peak wavelengths greater than 550nm (about 3000°K) cause less impact on bats (BCT, 2018).
- All lanterns will have zero upward ratio and cowling/shields will be integrated into lanterns in locations where bat habitat exists in accordance with BCT guidance.

No additional light spill is anticipated along the riparian corridor because of the proposed lighting scheme.

While the above scheme has sought to minimise potential impacts from increased lighting at Hanover Park on bats, there may be some minor changes in bat foraging behaviour during peak bat activity at certain times in the year arising from avoidance of brightly lit areas within scattered trees at the playground area which will have an average of 5 Lux, and along the woodland edge where the Lux varies between 1 and 5.

5.4 Cumulative / In-Combination Effects

Carlow Municipal District undertook small-scale upgrade works at Hanover Park during October 2021. These works included upgrade of existing footpath and installation of outdoor classroom which resulted in the partial conversion of Improved Amenity Grassland (GA2) to Buildings and Artificial Surfaces (BL3) with minimal negative impacts on local ecology. Two lighting columns situated adjacent to the river were relocated to outside of the 10m setback from the river which resulted in lower light pollution along the riparian corridor. All lighting within the Park were upgraded to LED to improve efficiency. Extensive native tree planting was undertaken in 2021 in Scattered Trees & Parkland and Improved Amenity Grassland habitats.

Relevant planning policies and granted planning permissions in the vicinity were considered for cumulative and in-combination effects in Section 4.3 of the NIS.

6 MITIGATION MEASURES

Mitigations to address protection of water quality of the adjacent River Burren and the potential introduction and spread of non-native invasive species are included in Section 5 of the NIS.

The following measures have been devised to reduce identified significant impacts on 'important' ecological features aside from the River Barrow and River Nore SAC.

6.1 Construction Phase

6.1.1 Protection of Trees and Woodland habitats during Works

- It is recommended that a qualified arborist be consulted prior to undertaking development works in proximity to individual and groups of trees in order to obtain site-specific advice to ensure their protection during the development phase.

6.1.2 Protection of Birds & Mammals during Works

- Under Sections 22 and 23 of the Wildlife Act 1976 (as amended), it is an offence to kill or injure a protected bird or to disturb their breeding / resting places. Most birds nest between March and August (inclusive). Therefore, it is recommended that any scrub removal is carried out between September and February (inclusive). If this is not possible, an ecologist will survey the affected area

in advance in order to determine whether any protected fauna is present. If any are encountered, the vegetation clearance will be delayed until the protected fauna have moved away from the area, e.g. when chicks have fledged and a nest has been abandoned.

6.2 Operational Phase

6.2.1 Wildflower Meadow Creation

It is recommended that the 10m Wildlife Buffer Zone be managed as Long-Flowering Meadow. The All-Ireland Pollinator Plan 2021- 2025 guidance documents recommend the following:

- This area should be left uncut until early September – one cut and lift per year.
- The annual cut in September should always be removed to reduce soil fertility over time, as wildflowers grow best in less fertile soils.
- Do not fertilise this area as fertiliser encourages the growth of grasses.
- Under this management, over a few years, the meadow will naturally become more flower-rich with local native species that are adapted to the site's conditions (note: where required you could mow in March to remove heavy winter growth for the first few years).
- Signage can be used to identify this area as deliberately managed as a meadow.
- Keeping a short narrow border at the edge will demonstrate that this meadow is being managed.
- Eliminate the use of herbicides or other pesticides on long-flowering meadow to ensure the protection of our pollinating insects.

6.2.2 Pollinator-Friendly Planting

- Consult guidance for local authorities from the All-Ireland Pollinator Plan 2015-2020 when designing the Biodiversity Garden and Enhanced Planting Area in order to include native species and / or ornamental plants that are good sources of nectar and pollen. This guidance is a great resource to aid selection of pollinator-friendly trees, shrubs, climbers, bulbs and perennials.

6.2.3 Native Tree Planting

- It is recommended to plant native trees and shrubs of local provenance as well as trees / shrubs of ornamental value (See Appendix 4 for examples). Many of the listed trees and shrubs are great for pollinators and provide fruit or nuts for birds and mammals in the autumn.

6.2.4 Additional Lighting Mitigations

- Cowling and shields are recommended to be fitted into lanterns (1A, 11A, and 12A) to direct light where it is needed and to reduce light spill in the vicinity of scattered trees and woodland habitats which have been identified habitats for foraging bats.
- Lanterns 11 and 12 should not be tilted and should be mounted in the horizontal to avoid any upward light spill.
- Dimming of proposed and existing lighting to Class P5 (3 Lux average and 0.6 Lux minimum) between 23.00 hrs. and 06.00hrs.

7 RESIDUAL IMPACTS AND CONCLUSION

Risks to protected fauna are low given that no trees will be removed as part of the proposed development. Minimal removal of scrub will take place and any such removal will be undertaken outside the season of peak nesting activity for birds or the area would be surveyed by an ecologist to confirm that no protected fauna were present. As a result, there will be no impact on local bird populations, and no legal offence under the Wildlife Act 1976 (as amended).

The proposed lighting scheme with additional lighting mitigations will ensure light pollution within the Park will be kept to a minimum while still providing sufficient public lighting for perceived security and safety. No residual effects on foraging habits of bats in the Park or other wildlife are foreseen.

It can be concluded that the proposed development will not cause any significant negative impacts on designated sites, legally protected species or features of ecological importance within the Zone of Influence of the proposed development.

The ethos of the Park design has a focus on biodiversity and natural habitats, and many of the mitigations included in Section 6 promote wildlife and pollinator-friendly management. It is envisaged that with the implementation of these mitigations, the resulting Park will have a net positive impact on wildlife and pollinators in the longer term.

Signed:

_____

Lisa Dowling MCIEEM

Ecological Consultant

Date: 7th April 2022

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APPENDICES

APPENDIX 1: PROPOSED LAYOUT

NOTES

1. This drawing is the property of Carlow County Council, it is a confidential document and must not be copied, used, or the contents divulged without prior written consent.
2. DO NOT SCALE, use figured dimensions only, if in doubt ask.

No.	Date	Amendment / Issue	Rev.
A	06/04/22	Issued for Comment	CDS

CARLOW COUNTY COUNCIL

CARLOW MUNICIPAL DISTRICT

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Carlow Local Authorities, A CPD Accredited Company

Project:

HANOVER ACTIVITY AND BIKE PARK

Title:

Proposed Layout

Drawn by:	Ciaran Brennan	Job No:	202201
Checked by:	Barry Keenan	Drw Loc:	My docs
Approved by:	Padraig O'Gorman	Dg. No:	4 of 4
Scale:	1:250 @ A1	Rev:	A
Date:	06/04/2022		

APPENDIX 2

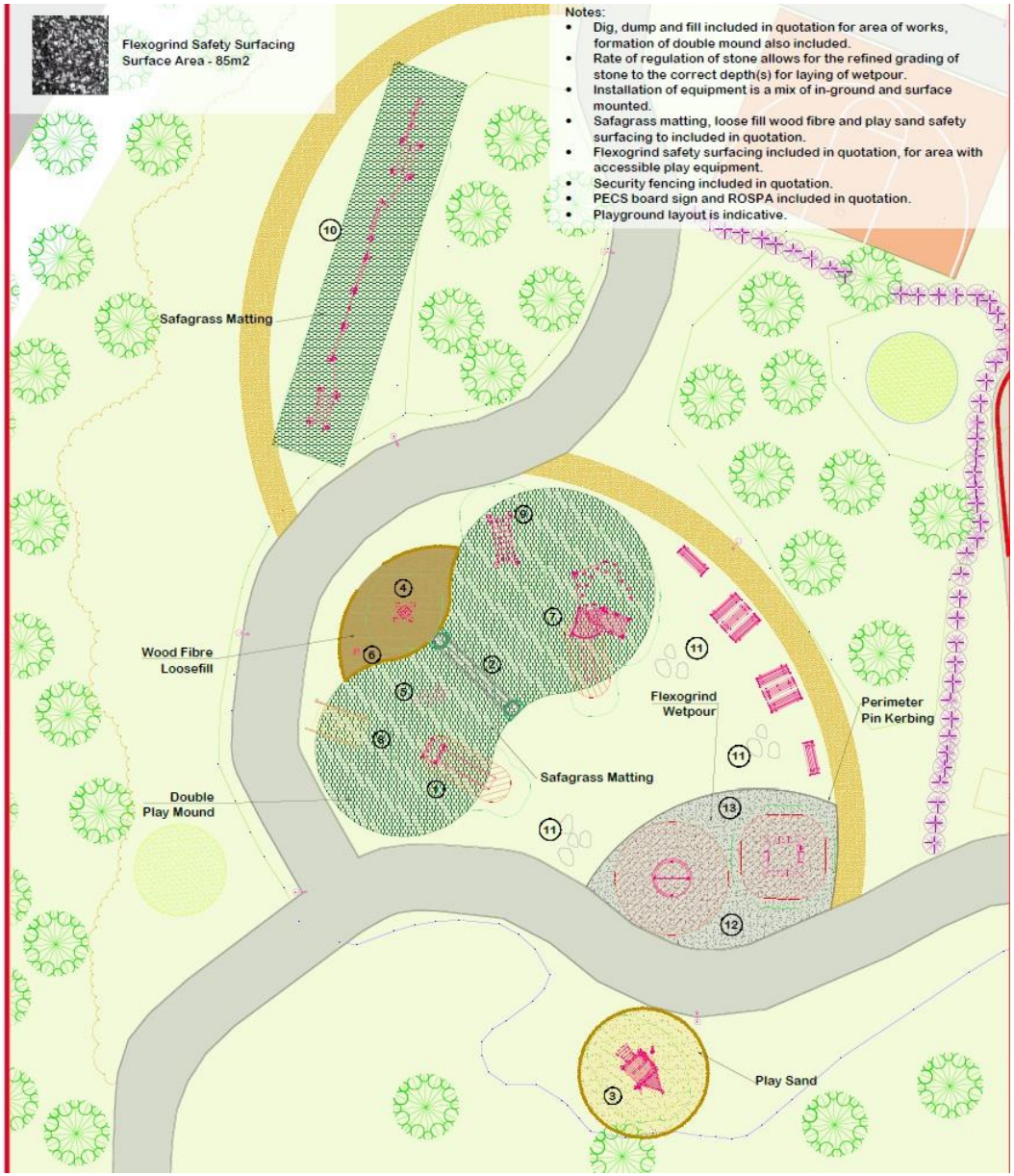
HANOVER ACTIVITY AND BIKE PARK: DETAILS OF PROJECT ELEMENTS

Equipment List

1. PCM110203 - Embankment Slide
2. IE-FIAGT60 - 6M Underground Tunnel
3. NRO530 - Oasis Sand Works
4. NRO212 - Seat Posts & Round Table
5. NRO518 - Oak Lizard Sculpture
6. NRO516 - Owl Sculpture
7. NRO703 - Play Hut with Stairway
8. Accessible Timber Steps
9. NRO631 - Balance Net
10. NRO865 - Agility Trail 6
11. Natural Play Boulders
12. PCM157 - Wheelchair Carousel
13. JUM10401 - Jumper Square, 1.5m x 1.5m

SIX PRINCIPLES FOR UNIVERSAL, INCLUSIVE DESIGN
PRODUCTS THAT ARE UNIVERSAL AND INCLUSIVE SHOULD BE:

1. Accessible
2. Multifunctional (when possible)
3. 360° design (play from all sides)
4. Equipped with diverse play opportunities
5. Clear in colour and design signals
6. Provided with special solutions for special needs when relevant



Notes:

- Dig, dump and fill included in quotation for area of works, formation of double mound also included.
- Rate of regulation of stone allows for the refined grading of stone to the correct depth(s) for laying of wetpour.
- Installation of equipment is a mix of in-ground and surface mounted.
- Safagrass matting, loose fill wood fibre and play sand safety surfacing to included in quotation.
- Flexogrind safety surfacing included in quotation, for area with accessible play equipment.
- Security fencing included in quotation.
- PECS board sign and ROSPA included in quotation.
- Playground layout is indicative.

3D Image of Bike Pump Track

Example of Completed Bike Pump Track (Night-time)

APPENDIX 3: DESKTOP RECORDS OF RARE & PROTECTED SPECIES

Data Obtained from National Biodiversity Data Centre Database for 10km square S77

Taxon	Scientific Name	Common Name	Latest Record	Legal Status	Conservation Status
		Birds			
Birds of Prey	*Circus cyaneus*	Hen Harrier	1972	BD1, WA	Amber
	Falco columbarius	Merlin	1972	BD1, WA	Amber
	Falco tinnunculus	Kestrel	2011	BD1, WA	Red
	Tyto alba	Barn Owl	2011	WA	Red
Chats & Thrushes	*Oenanthe oenanthe*	Northern Wheatear	1972	WA	Amber
Gamebirds, Crakes & Rails	*Crex crex*	Corncrake	1991	BD 1, WA	Red
	Fulica atra	Common Coot	2011	WA	Amber
	Perdix perdix	Grey Partridge	1972	WA	Red
Herons	*Egretta garzetta*	Little Egret	2016	BD1, WA	-
	Botaurus stellaris	Great Bittern	1963	WA	Amber
Gulls, Terns & Auks	*Larus fuscus*	Lesser Black-backed Gull	2014	WA	Amber
	Larus marinus	Great Black-backed Gull	2001	WA	Amber
	Larus ridibundus	Black-headed Gull	2011	WA	Red
Larks, Swallows & Pipits	*Alauda arvensis*	Sky Lark	2017	WA	Amber
	Anthus pratensis	Meadow Pipit	2011	WA	Red
	Delichon urbicum	House Martin	2011	WA	Amber
	Hirundo rustica	Barn Swallow	2017	WA	Amber
	Motacilla cinerea	Grey Wagtail	2011	WA	Red
	Riparia riparia	Sand Martin	2011	WA	Amber
Cormorant	*Phalacrocorax carbo*	Cormorant	2016	WA	Amber
Starling	*Sturnus vulgaris*	Starling	2014	WA	Amber
Sparrows, Finches & Bunting	*Carduelis cannabina*	Linnet	2014	WA	Amber
	Carduelis chloris	Greenfinch	2017	WA	Amber
	Emberiza citrinella	Yellowhammer	2015	WA	Red
	Passer domesticus	House Sparrow	2016	WA	Amber
	Passer montanus	Tree Sparrow	2011	WA	Amber
Swifts, Woodpeckers & Allies	*Alcedo atthis*	Kingfisher	2017	BD1, WA	Amber
	Apus apus	Common Swift	2017	WA	Red
Waders & Sandpipers	*Actitis hypoleucos*	Sandpiper	1991	WA	Amber
	Gallinago gallinago	Snipe	2017	WA	Red
	Numenius arquata	Curlew	2017	WA	Red
	Pluvialis apricaria	European Golden Plover	2011	WA	Red
	Scolopax rusticola	Woodcock	1991	WA	Red
	Vanellus vanellus	Northern Lapwing	2017	WA	Red

Warblers & Flycatchers	*Muscicapa striata*	Spotted Flycatcher	2017	WA	Amber
	Regulus regulus	Goldcrest	2017	WA	Amber
Wildfowl	*Anas clypeata*	Northern Shoveler	1984	BD2, BD3, WA	Red
	Anas crecca	Teal	2011	WA	Amber
	Anas penelope	Wigeon	1984	WA	Amber
	Anas strepera	Gadwall	2011	WA	Amber
	Aythya ferina	Common Pochard	2001	WA	Red
	Aythya fuligula	Tufted Duck	2011	BD2, BD3, WA	Amber
	Cygnus columbianus	Bewick's Swan	1984	WA	Red
	Cygnus cygnus	Whooper Swan	2011	BD1, WA	Amber
	Cygnus olor	Mute Swan	2017	WA	Amber
		Mammals			
	Cervus elaphus	Red Deer	2008	WA	LC
	Erinaceus europaeus	Hedgehog	2018	WA	LC
	Lepus timidus subsp. *hibernicus*	Irish Hare	2013	HD5, WA	LC
	Lutra lutra	Otter	2018	HD2, WA	NT
	Martes martes	Pine Marten	2014	HD5, WA	LC
	Meles meles	Badger	2017	WA	LC
	Myotis daubentonii	Daubenton's Bat	2014	HD4, WA	LC
	Myotis nattereri	Natter's Bat	2009	HD4, WA	LC
	Mustela erminea subsp. *hibernica*	Irish Stoat	2014	WA	LC
	Nyctalus leisleri	Leisler's Bat	2009	HD4, WA	NT
	Pipistrellus pipistrellus sensu lato	Pipistrelle	2013	HD4, WA	LC
	Pipistrellus pygmaeus	Soprano Pipistrelle	2009	HD4, WA	LC
	Plecotus auritus	Brown Long-eared Bat	2013	HD4, WA	LC
	Sciurus vulgaris	Red Squirrel	2017	WA	NT
	Sorex minutus	Pygmy Shrew	2018	WA	LC
		Amphibians			
	Lissotriton vulgaris	Smooth Newt	2020	WA	LC
	Rana temporaria	Common Frog	2018	HD5, WA	LC
		Reptiles			
	Zootoca vivipara	Common Lizard	1970	WA	LC
		Invertebrates			
	Haliplus (Haliplinus) lineolatus	Beetle	1935		NT
	Coenonympha pamphilus	Small Heath	2018		NT
	Bombus cryptarum		2010		dd

Taxon	Scientific Name	Common Name	Latest Record	Legal Status	Conservation Status
	Bombus (Melanobombus) lapidarius	Large Red-tailed Bumble Bee	2020		NT
	Bombus (Thoracombus) muscorum	Moss Carder-bee	2015		NT
	Austropotamobius pallipes	Freshwater White-clawed Crayfish	2014	HD2, HD5	NA
	Balea perversa	Tree Snail	1940		VU
	Merdigera obscura	Lesser Bulin	1971		EN
	Musculium lacustre	Lake Orb Mussel	1971		VU
		Non-Vascular Plants			
	Tortula modica	Blunt-fruited Pottia	1867		VU
		Vascular Plants			
	Centaurea cyanus	Cornflower	2020	-	WL
	Carduus tenuiflorus	Slender Thistle	2020	-	NT

* Codes used in the 'legal status' column are as follows: HD2 – species protected under Annex II of EC Habitats Directive (animal and plant species of community interest whose conservation requires the designation of special areas of conservation; HD4 – species protected under Annex IV of EC Habitats Directive (animal and plant species of community interest in need of strict protection); HD5 – species protected under Annex V of EC Habitats Directive (animal and plant species of community interest whose taking in the wild and exploitation may be subject to management measures); BD – species that are listed on Annex I of the EC Birds Directive; WA - species that are protected under the Wildlife Act 1976 (as amended); FPO – species listed on the Flora (Protection) Order 2015, which receive protection under the Wildlife Act 1976 (as amended).

** Codes in the 'conservation status' column refer to national red lists (see Bibliography), using the following supplementary categories: RE (regionally extinct), CR (critically endangered), EN (endangered), VU (vulnerable), NT (near-threatened), LC (least concern), WL (waiting list), dd (data deficient) or NA (not assessed). Birds are assessed using the Red-Amber-Green categories as defined in Gilbert et al. (2021).

APPENDIX 4: NATIVE BIODIVERSITY-FRIENDLY TREES AND SHRUBS

Hawthorn / Whitethorn (*Crataegus monogyna*) (height up to 15m), a common hedgerow species, it can also be grown as a standalone tree - a very wildlife-friendly option, producing lots of flowers for pollinators and red haws in autumn for birds to enjoy. Hawthorn supports c.149 insect species.

Rowan / Mountain Ash (*Sorbus aucuparia*) (height 8 - 15m) supports 28 insects and 125 lichens. It is a very attractive tree, with white flower clusters in spring for pollinators, and red berries in autumn.

Alder (*Alnus glutinosa*) (height to over 20m) provides food and shelter to wildlife, with a number of insects, lichens and fungi being completely dependent on the tree. Grows in damp areas and along riverbanks.

Goat Willow (*Salix caprea*) (height up to 12m) and **Grey Willow** (*Salix cinerea*) (height up to 10m) are deciduous trees common in damp ground or alongside rivers. They flower in March to April. Their catkins are a good source of early pollen. Willow trees in general are very important for wildlife and collectively support vast numbers of insects and notably moth species. These trees will grow readily from cuttings.

Hazel (*Corylus avellana*) (height up to 12m) is a small native tree or shrub that produces edible hazelnuts in autumn for mammals and birds. Hazel also supports 73 insect species and 160 lichens.

Blackthorn (*Prunus spinosa*) (height 6 - 7m) provides a home for 109 insect species. The sloes of the blackthorn resemble small plums and are enjoyed by many animals such as wood mice, finches and foxes.

Downy Birch (*Betula pubescens*) (height up to 30m) supports 229 insect species and 126 lichens. In spring, its growth of seed-rich yellow-brown catkins attracts birds.

Crab Apple (*Malus sylvestris*) (height 7 - 10m) can be found in many old native hedgerows. It supports 93 insect species, including pollinators, and crab apples provide food for birds and mammals in autumn.

Guelder Rose (*Viburnum opulus*) (height up to 4m) is a small tree of hedgerows, woods, and damp ground. It displays large, white flowers in summer and red berries in autumn, which feed all kinds of birds.

Spindle (*Euonymus europaeus*) (height up to 6 - 9m) flowers from in May to June and has very attractive pink berries in September or October. Wildlife loves its leaves and fruit, and aphids flock to it, bringing with them an array of their predators.

Wild Privet (*Ligustrum vulgare*) (height up to 3 - 5m) is a shrub of hedgerows, woodlands and scrub, but is also a popular garden-hedge plant. It has white flowers in summer and matt-black berries in winter which are eaten by thrushes and other birds.

Appendix D – Site Specific Flood Risk Assessment Report

Report on compliance with the requirements of the Technical Appendices (Section 1.6) contained in the document “The Planning System and Flood Risk Management”.

Name of Applicant	Carlow County Council
Development Address	Hanover Park, Carlow
Development type	Hanover Cycle Park
Planning reference	N/A
Plans	
Location plan that includes geographical features, street names and identifies the catchment, watercourses or other bodies in the vicinity.	Attached: Proposed Hanover Activity and Bike Park
A plan of the site showing the existing site and development proposals;	Attached: Proposed Hanover Activity and Bike Park
Identification of any structures, which may influence local hydraulics. This will include bridges, pipes/ducts crossing the watercourse, culverts, screens, embankments, walls, outfalls and condition of channel;	Bridge crossing the River Burren which connects to the adjacent shopping centre
Existing Flood Mapping	
CFRAM mapping	CFRAM mapping is available for this area
FFRA mapping	
Other	Carlow Town Flood Relief Scheme mapping is available for this area.
Climate Change	The current scenario 0.1% AEP flood level can be used as a surrogate for the mid-range climate change scenario 1% AEP flood level.

Surveys	
Site levels related to Ordnance Datum, both existing and proposed;	See attached map, there will be no significant changes in site levels resulting from the proposed development.
Appropriate cross-section(s) of the site showing finished floor levels or road levels, or other relevant levels relative to the source of flooding; and	See attached map: Proposed Hanover Activity and Bike Park
Anticipated water levels and associated probabilities (CFRAM)	1% AEP = 47.95 to 48.54 0.1% AEP = 48.34 to 48.94
Assessments	
Hydraulic flood modelling	CFRAM flood model
Consideration of the flood zone in which the site falls and demonstration that development is appropriate given the flood zone and the vulnerability criteria set out in this Guidance;	A small part of the park adjacent to the riverbank falls within the 1% AEP flood zone. A small portion of the park to the north west falls within the 0.1% AEP flood zone (see map below)
Flood alleviation measures already in place, their state of maintenance and their performance;	No existing flood measures are in place. There are proposals for an embankment at the western site boundary (to protect the adjacent shopping centre), contained in the Carlow Town Flood Relief Scheme.
Information about all potential sources of flooding that may affect the site – from rivers and the sea, streams, surface water run-off, sewers, groundwater, reservoirs, canals and	The identified flooding source will be fluvial flooding from extreme events in the River Burren.

other artificial sources or any combination of these;	
The impact of flooding including; - The likely rate at which flooding might occur (i.e. rapid onset or slow rise of flood water); - The speed of flow of flood water; - The order in which various parts of the location or site might flood; - The likely duration of flood events; and - The economic, social and environmental consequences of flooding on occupancy of the site;	Not applicable for a water compatible development
Information on extent and depth of previous flood events or on flood predictions;	.
An assessment of how safe access and egress can be provided for routine and emergency access under both frequent and extreme flood conditions; An assessment of how the layout and form of development will reduce or minimise flood risk;	Not applicable for a water compatible development
Proposals for surface-water management according to sustainable drainage principles and any strategy developed in the SFRA for the area, with the aim of not increasing, and where practicable, reducing the rate of run-off from the site as a result of the development	There will be no significant changes to the surface water regime in the area

The likely impact of any displaced flood water on third parties caused by alterations to ground levels, reducing floodplain attenuation, impeding flood flow routes or raising flood embankments and the means of providing compensation for this loss of floodplain, where necessary.	There will be no changes in site levels and therefore there will be no impacts on the flood regime in the area.
Details on how to approach the provision of floodplain compensation is provided in Appendix B section 3.3.	There will be no changes in site levels and therefore there will be no impacts on the flood regime in the area.
In addition to the requirements listed above, when completing a site-based FRA as part of meeting the requirements of the Justification Test, an assessment will be required of on- and off-site opportunities for reducing flood risk overall (e.g. flood storage). This will include an appraisal of wider flood risk management measures to which the development can contribute.	There will be no changes in site levels and therefore there will be no impacts on the flood regime in the area. The proposed development is considered to be a water compatible development in the context of the flood risk planning guidelines; therefore the Justification Test is not required.
Justification Test	The proposed development is considered to be a water compatible development in the context of the flood risk planning guidelines; therefore the Justification Test is not required.
Guidance Documents	The Planning System and Flood Risk Management, Guidelines for Planning Authorities (DEHLG, 2009) and Technical Appendices Joint Spatial Plan for the Greater Carlow-Graiguecullen Urban Area 2012 -2018: Strategic Flood Risk Assessment

Attachments	Drawing: Proposed Hanover Activity & Bike Park (25-1-2021) Extract from CFRAM Map 014CAR_EXFCD_FO-09 (24-11-2016)

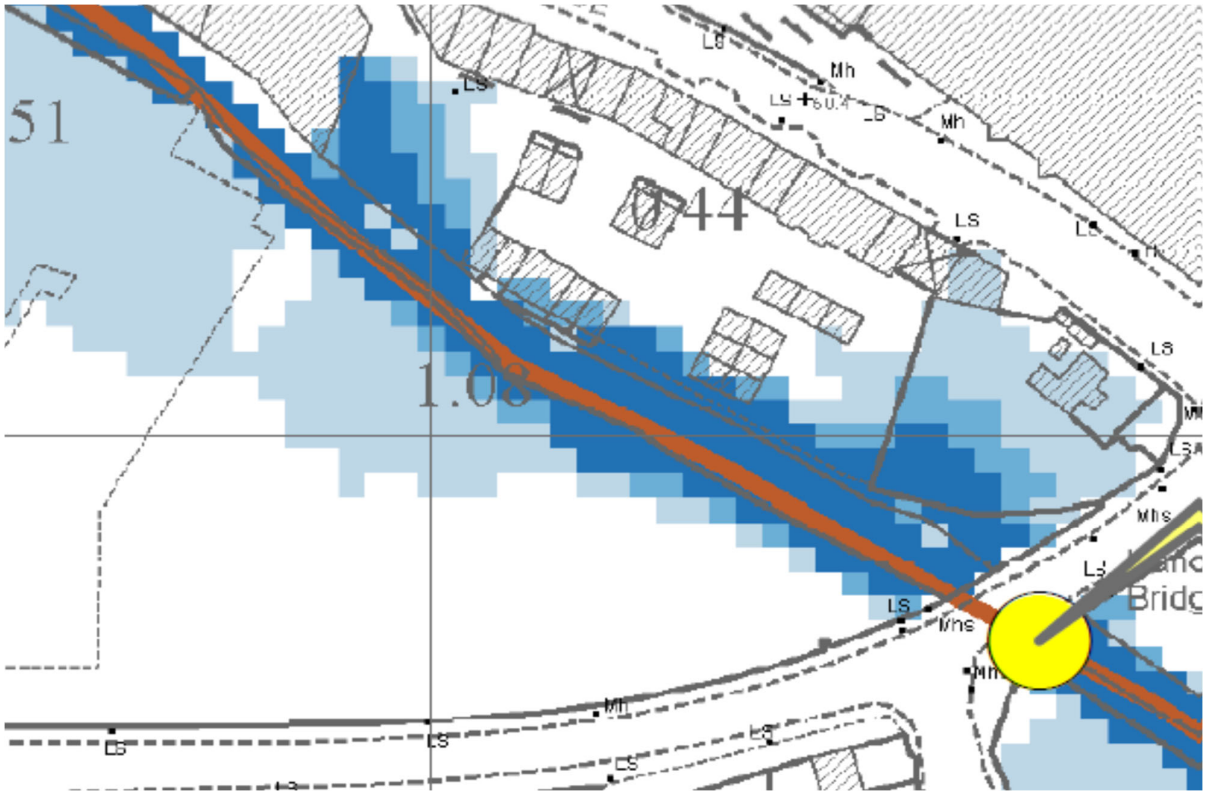
Signed: ***Pat Connolly, SEE***

Environment Section

Carlow County Council

Date: 1-2-2021

		CFRAM	
		0.1% AEP	**1% AEP**
00047 d/s Pennys	324m	47.70	47.23
Penny Bridge	257m	47.98	47.47
End car park	173m	48.34	47.95
Start park	173m	48.34	47.95
End park	30m	48.94	48.54
080Da Hanover Br.	↑↑	49.07	48.67



Appendix E – Noise Impact Assessment Report

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NOISE IMPACT ASSESSMENT REPORT

HANOVER ACTIVITY & BIKE PARK
CARLOW TOWN
CO. CARLOW

2021

REPORT NO:	NIA_21_9955	**AUTHOR:**	Nial Ryan, MSc.
DATE:	14th January 2021	**REVIEWED:**	Martin O'Looney, BSc. Mike Fraher, BSc.

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APPENDICES

EXECUTIVE SUMMARY

This Noise Impact Assessment Report has been prepared on behalf of and for the exclusive use of Carlow County Council, by Panther Environmental Solutions Ltd, with respect to an application for planning permission for the proposed park redevelopment and all associated works at Hanover, Carlow Town, Co. Carlow.

This report presents the findings of this assessment and provides a description of the current noise environment and a predictive analysis of the impact resulting from proposed activity within the redevelopment park upon noise sensitive receptors (NSR's) to determine the need for mitigation measures.

Screening of the park in line with the EPA guidance document, *2016 Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)*, has determined that the park is not located in a '*Quiet Area'*. Given the noise monitoring results obtained, the character of the area and our experience of noise monitoring within the area, it was determined the park is not located within a *'Low Background Noise Area'*.

The baseline assessment indicates that current park activities are not causing a nuisance at noise sensitive locations in the vicinity of the existing park.

Monitored L_{90} noise levels at the six monitoring locations ranged between 47 dB and 52 dB. Background noise monitoring was dominated by non-park related traffic noise at the majority of noise monitoring locations.

Predictive park activity noise levels were calculated to range between 41 dB and 49 dB at the closest noise sensitive receptors, which are below the recommended EPA daytime limit of 55 dB.

Predictive park activity noise levels were also calculated to range 0 dB and –6 dB below the corresponding background noise level, indicating that the proposed park activities would create little to no impact, as per BS4142 impact criteria.

Daytime noise levels arising from the construction phase at noise sensitive receptors were calculated to be between 18 dB and 24 dB above the existing background noise levels (L_{90}) at noise monitoring (NM) locations.

Predicted construction noise levels at two of the five noise sensitive receptors (NSR1 and NSR2) have been determined to comply with the NRA guidance limit of 70 dB(A) for construction activity during weekdays (Monday – Friday).

Predictive construction noise levels were calculated to range between 65 dB and 73 dB at the closest noise sensitive receptors, which includes a +5 dB noise character penalty to account for potential distant tonal noise from equipment.

It is anticipated that construction activities would generally be conducted between the hours of 07:00am and 19:00pm Monday to Friday. Predicted noise levels from the construction phase of the redevelopment are not anticipated to exceed the NRA guidance levels once recommended mitigation measures are adhered to.

It is recommended that a temporary noise barrier should be erected on the sites northern boundary, at a distance of 20m (accounting for the 15m wide River Burren and a 5m setback distance) from NSR4 and NSR5, during the construction period in order to comply with the NRA guidance limit of 70 dB(A).

It has been calculated that a 3-meter height temporary barrier, erected on the northern park boundary, would reduce construction noise levels by 6 dB, resulting in compliance to the NRA guidance limit of 70 dB(A) at NSR4 & NSR5.

A full list of recommendations can be found in Section 10 of this report.

1.0 INTRODUCTION & SCOPE OF WORK

Panther Environmental Solutions Ltd (PES Ltd) were commissioned by Carlow County Council to carry out a Noise Impact Assessment for the proposed redevelopment at Hanover Park located in Carlow Town, Co. Carlow. The proposed redevelopment would occur within the existing park boundary, which predominantly consist of managed parkland, and features a single footpath, a bridge and a concrete bandstand.

The proposed park plan can be broken down into a number of different activities/features as follows:

- Upgrade the existing paths/trails to separate Youth Cyclist Trails with younger Bike Skills Features.
- Mountain Bike Pump Track.
- Develop Biodiversity & Wild Flower Garden Theme Throughout.
- Develop a Natural Playground Activity Area with Natural Materials
- Develop an Outdoor Classroom / Theatre Area and upgrade the Existing Band Stand
- Provide a Mini-Basketball Court

The area is urban in character with residences in the area predominantly consisting of apartment and housing estates. The closest noise sensitive receptor to the park in each geographical direction are as follows:

- NSR1 – Residential property west of the park boundary.
- NSR2 – Residential property southwest of the park boundary.
- NSR3 – Residential property south of the park boundary.
- NSR4 – Residential property north of the park boundary.
- NSR5 – Residential property northeast of the park boundary.

A map of the park boundary, surrounding noise sensitive receptors and monitoring locations is provided in Appendix B.

The report presents and interprets the results of the survey with reference to the 2016 EPA *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)* and the *'BS4142:2014 – Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas'* as published by The British Standards Institution.

This Noise Impact Assessment included:

1. Description of noise and the noise meter to be used.
2. Detailing the locations for noise monitoring stations.
3. Detailing the noise measurements obtained.
4. Determine the baseline noise levels at the closest sensitive receptors;
5. Predict the impact of the proposed new development's construction and operational phases on the noise sensitive receptors.
6. Discussion & Recommendations.

2.0 RELEVANT NOISE LEGISLATION & GUIDANCE

Planning and Development Act 2000 (S.I. No. 30 of 2000), as amended
Local authorities are responsible for the planning and environmental regulation of any proposed developments. The current planning and environmental regulatory framework requires these developments to comply with the Planning and Development Act (2000) and related regulations.

The local authorities and An Bord Pleanala attach conditions relating to environmental management of these developments to planning permissions granted. Local authorities consider the land use and planning issues associated with the proposed developments in their County Development Plans.

The EPA Act (Noise) Regulations 1994 (S.I. No. 179 of 1994)
The relevant part of the Environmental Protection Agency Act 1992 dealing with noise is Part VI, Sections 106 to 108. These Sections deal with the control of noise, the power of local authorities to prevent or limit noise and the issue of noise as a nuisance.

The 1994 Regulations came into effect in July 1994 and outline the procedures for dealing with noise nuisance. The Regulations allow affected individuals, local authorities or the EPA to take action against an activity causing a noise nuisance.

These Regulations replaced the procedures for noise complaints contained in the Local Government (Planning & Development) Act 1963. Companies must show that reasonable care was taken to prevent or limit the noise from their activities. If the courts decide that a company is responsible for causing a noise nuisance, they can order the company to take measures to reduce, prevent or limit it.

EPA 'Guidance Note on Noise (NG4)' (2016)
The document relates primarily to noise surveys and assessments for EPA licensed facilities but in the absence of any other directly applicable guidance documents, it also is pertinent for the purposes of noise surveys and assessments accompanying planning applications.

It deals in general terms with the approach to be taken in the measurement and control of noise, and provides advice in relation to the settling of noise ELV's and compliance monitoring. In line with World Health Organisation (WHO) guidance, it recommends that the following noise levels not be exceeded at the facades of the nearest noise-sensitive receptors:

Period	Times	Standard dB(A)	Low Background Noise Area dB(A)
Day	07:00 - 19:00hrs	55dB $L_{Ar,T}$	45dB $L_{Ar,T}$
Evening	19:00 - 23:00hrs	50dB $L_{Ar,T}$	40dB $L_{Ar,T}$
Night	23:00 - 07:00hrs	45dB $L_{Aeq,T}$	35dB $L_{Ar,T}$

The National Roads Authority (NRA) Guidelines for the Treatment of Noise and Vibration in National Road Schemes (2004)

The NRA's guidance document Guidelines for the Treatment of Noise and Vibration in National Road Schemes (2004) is the recognised Irish guidance document for the assessment of road traffic noise. This document sets out the key items that should be included in a noise and vibration assessment for any significant road scheme. As a minimum, it stipulates that the following items should be included:

- A series of noise surveys to quantify the prevailing noise climate at sensitive receptors along the existing and proposed routes
- Preparation and calibration of a suitable noise prediction model;
- Prediction of Do Minimum and Do Something noise levels for opening and design years;
- Comparison of predicted Do Something noise levels with the design goal and three conditions that must be satisfied before mitigation measures are deemed necessary;
- Specification and assessment of road traffic mitigation measures, where required;
- Assessment and review of construction impacts and mitigation measures;
- Assessment and review of vibration.

This document has been referred to in the consideration of road traffic noise associated with the proposed development. The document also presents maximum permissible noise levels at dwelling facades during construction activities. This provide a useful reference for assessing construction noise of the proposed development.

The National Roads Authority (NRA) Guideline Construction Noise Limits			
Period	**Times**	**$L_{Aeq\ (1hr)}$ dB**	**$L_{pA\ (max)slow}$ dB**
Monday to Friday	07:00 to 19:00hrs	70	80
Monday to Friday	19:00 to 22:00hrs	60	65
Saturday	08:00 to 16:30hrs	65	75
Sundays and Bank Holidays	08:00 to 16:30hrs	60	65

3.0 MEASUREMENT PARAMETERS

The parameters used to assess the noise are as follows:

Leq(T): The noise values recorded continuously at every instant during the T-minute sampling period are integrated by the noise metre to give a single value that represents the continuous equivalent sound level over the 30-minute period during this survey.

L_{10} and L_{90}: are both statistical noise levels. L_{10} indicates that for 10% of the monitoring period the sound levels were greater than the quoted value. L_{90} indicates that for 90% of the monitoring period, the sound levels were greater than the quoted value. L_{10} is used to express event noise. L_{90} is used to express background noise, usually filtering out loud and intermittent interferences such as traffic noise.

Continuous: noise produced without interruption.

Intermittent: noise that is punctuated with interruptions e.g. equipment operating in cycles or events such as single passing vehicle or aircraft.

Impulsive: a noise of short duration (typically less than one second), the sound pressure of which is significantly higher than the background; brief and abrupt.

Tonal: noise which contains a clearly audible tone i.e. a distinguishable, discrete or continuous note (whine, hiss, hum or screech etc).

For the purpose of this noise assessment, a tonal characteristic incurs a penalty of +5dB(A) in accordance with Section 4.3 of the EPA 2016 *Guidance Note for Noise in Relation to Scheduled Activities*.

In order for a tone or impulsive element to warrant a penalty, it should be clearly noticeable and audible. Situations in which a 5 dB penalty applies include the following:

- The noise contains a distinguishable, discrete continuous note (whine, hiss, screech, hum etc).
- The noise contains distinct impulses (bangs, clicks, clatters, or thumps).
- The noise is irregular enough to attract attention.
- The tonal components are clearly audible and the level in a 1/3rd octave band is greater than or equal to the following level in the two adjacent bands;
    - 15dB in low-frequency bands (25Hz to 125Hz);
    - 8dB in middle-frequency bands (160Hz to 400Hz), and;
    - 5dB in high-frequency bands (500Hz to 10,000Hz)

The noise measurements were ‘A’ weighted (to equate to human ear hearing) and the time-weighting ‘Fast’ was applied.

A-Weighted Decibels dB(A)

Noise, in its simplest form can be described as unwanted sound. Sound is the result of a propagating disturbance through a physical medium i.e. sound wave. Through air, it is perceived by the ear as a pressure wave superimposed upon the ambient air pressure about the ear of the listener. When the medium is a fixed body, it is called vibration.

'A' Weighting is standard weighting of the audible frequencies designed to reflect the response of the human ear to noise. At low and high frequencies, the human ear is not very sensitive, but between 500 Hz and 6 kHz the ear is much more sensitive. In the A-weighted system, the decibel values of sounds at low frequencies are reduced compared with un-weighted decibels, in which no correction is made for audio frequency.

Sound level (Lp dB) and sound power (L_W dB) are physical quantities which measure derivatives of the energy associated with a sound that can be measured by recording instruments.

Loudness is a psycho-physical subjective measure of the perceived response by the human auditory system to a sound. The loudness level of a sound is determined by adjusting a sound pressure level of a comparison pure tone of specified frequency until it is judged by normal hearing observers to be equal in loudness. Loudness level is expressed in phons.

In the mid-frequency range at sound pressures greater than approximately $2x10^{-3}$ Pa (40 dB re 20 µPa SPL), the following table summarises the average subjective perception of noise level changes.

WHO International: Fundamentals of Acoustics			
Change in Sound Level (dB)	Change in Power		Change in Apparent Loudness
	Decrease	Increase	
3	1/2	2	Just Perceptible
5	1/3	3	Clearly Noticeable
10	1/10	10	Half or Twice as Loud
20	1/100	100	Much Quieter or Louder

As can be seen in the above table, an increase of 3 dB is double the sound power level; however, the change in loudness is just perceptible.

The term L_{eq} is used to express the average noise level. It is measured in dB (A) and measured over a defined period of time. Specifically, it is the constant level equivalent to the same acoustic energy as a given event. The L_{eq} is written as LA_{eq} when it is measured with the A frequency weighting.

4.0 EQUIPMENT USED

The equipment used for the noise monitoring was a Cirrus CR:171B Sound Level Meter, a MK:224 Microphones and a CR:515 Acoustic Calibrator. The CR:171B was calibrated externally on 24th July 2020, while both the CR:515 and MK:224 were calibrated externally on 23rd July 2020. The CR:171B conforms to IEC 61672-3:2013.

A calibration check of 94 dB(A) at 1kHz was carried out on the instrument before and after measurement. The calibrator is a Class 1 grade, which conforms to IEC 60942:2003.

The difference between the initial calibration value, any subsequent calibration check, and a final calibration check on completion of measurements did not exceed 0.5 dB, and the instrument calibration was found to be satisfactory.

Measurement periods were appropriate to establish a typical noise level reading at each location in order to establish a dB(A) L_{Aeq} reading.

5.0 METEOROLOGICAL CONDITIONS

Weather conditions during the survey were dry, cool and calm with wind speeds of less than 5 m/s (the preferred limit for taking measurements).

The Sound Level Meter was also fitted with a windshield to minimise interference from meteorological conditions.

6.0 BASELINE NOISE ASSESSMENT

6.1. BASELINE NOISE ASSESSMENT METHODOLOGY

Baseline noise monitoring was carried out in general accordance with the EPA, 2016 '*Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities* (*NG4*)'.

In order to predict the impact of the construction phase and park activity phase of the proposed redevelopment, sample noise monitoring locations (NM's) were selected based upon the nearest noise sensitive receptors (NSR's) with regard to the park and intervening topography.

The baseline environmental noise levels at NM1 – NM5 locations were determined by instrumented monitoring of existing noise levels. This was determined by taking broadband noise measurements at these six noise monitoring locations.

It is considered that noise levels measured at each of the NM locations would be representative of typical noise levels at the nearest residential property or noise sensitive receptors.

Table 6.1: Noise Monitoring Locations				
Ref.	**Grid Ref**		**Location Type**	**Location**
	X	**Y**		
NM1	272094	176385	Noise Monitoring Location	Within the adjacent carpark at a similar setback distance from the R448 roadway as NSR1.
NM2	272114	176316		Within the Riverside residential area at a similar setback distance from the R448 roadway as NSR2.
NM3	272212	176328		Within the Riverside residential area at a similar setback distance from the R448 roadway as NSR3.
NM4	272171	176452		At the northern most boundary of the existing Hanover Park.
NM5	272220	176417		At the north-eastern boundary of the existing Hanover Park.
NM6	272267	176385		At the eastern most boundary of the existing Hanover Park.

Grid Ref Source: https://irish.gridreferencefinder.com/

All measurements were taken at:

- 1.2 – 1.5 metres height above local ground level
- 3.5 metres away from reflective surfaces

These monitoring points are mapped in Appendix B.1.

The results of the baseline noise assessment survey are detailed in Section 7.2 below.

6.2 NOISE PREDICTION METHODOLOGY

BS 4142:2014

The British Standard EN BS 4142 '*Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas*' provides a method for predicting the likelihood of impact from noisy activities such as industrial activities, quarries and landfills etc.

A correction factor, typically of up to +6dB for tonal elements and up to +9dB for impulsive elements, may be applied arithmetically to the predicted noise from the proposed activity based upon the character of the noise, audibility and its likelihood to cause nuisance. This is termed the 'rating level'.

If the rating level exceeds the background L_{90} by 10 dBA or more, this is likely to be an indication of a significant adverse impact.

A positive difference of around 5 dBA could be an indication of an adverse impact, depending on the context.

The lower the rating level is relative to the measured background sound level, the less likely it is that there will be an adverse impact. The greater the rated level is determined to below the background L_{90} the less likely an impact would occur.

ISO 9613-2:1996

The noise prediction methodology used in this report is based upon the international standard ISO 9613-2 "*Attenuation of Sound during Propagation Outdoors*".

This standard outlines a method for calculating the attenuation of sound during propagation outdoors in order to predict the levels of environmental noise at a distance from a variety of sources.

The central formula for this calculation is as follows:

$$\mathbf{A = A_{div} + A_{gr} + A_{bar} + A_{misc}}$$

Where:
A is the attenuation due to site conditions
A_{div} is the attenuation due to the geometrical divergence (distance from source)
A_{gr} is the attenuation due to the ground effect
A_{bar} is the attenuation due to a barrier
A_{misc} is the attenuation due to miscellaneous other effects as appropriate

This attenuation factor is then subtracted from the predicted park activity noise at the proposed activity. The resultant figure is the predicted noise from the proposed activity at a given noise monitoring location.

This figure may then be added logarithmically to the existing background noise at the noise monitoring location to attain the predicted noise level if the proposed activity were to begin.

Relevant Formulae

In order to carry out this predictive analysis, the following attenuation characteristics have been taken into account:

Divergence – A_{div}

The geometrical divergence accounts for the spherical spreading in the free field from the point sound source, causing attenuation due to the inverse square law. Divergence is calculated as follows:

$$A_{div} = 20.\text{Log}\,(\frac{\text{d}}{\text{do}})$$

Where:
d is the distance from the source to the receiver (meters)
d_o is the reference distance (1-meter)

Predictive Assessment Locations

Using the outline formula above and the results of the baseline assessment, predictive analysis was carried out for the following closest noise sensitive receptors (NSR's) in the vicinity of the redevelopment site:

Table 6.2: Noise Sensitive Receptors

Ref.	Grid Ref		Location Type	Location
	X	Y		
NSR1	272054	176387	Noise Sensitive Receptors	Residential property west of the park, adjacent to the R448.
NSR2	272128	176317		Residential property southwest of the park, within Riverside Estate.
NSR3	272232	176332		Residential property south of the park, within Riverside Estate.
NSR4	272200	176443		Residential property northeast of the park, within Hanover Court.
NSR5	272245	176419		Residential property north of the park, within Hanover Court.

Grid Ref Source: https://irish.gridreferencefinder.com/

The results of the baseline noise assessment survey are detailed in Section 7.3 below.

6.3 SOURCE NOISE SPECIFICATIONS

6.3.1 Construction Noise

The noisiest aspect of the proposed development is likely to be the construction phase of the project. During construction, the noisiest phases are typically site clearing, excavation and landscaping activities.

Table 6.3 contains typical noise levels from various construction plant that will be used during the construction phase. These standard noise emission data, recalculated from 10m to 1m, will be used for the purposes of the worst-case noise assessment of the proposed works.

Table 6.3: Noise Levels from Construction Plant (Ref: BS5228:2009)

Sound Pressure Level (Lp) at Octave Band Centre Frequency									
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**Leq**
C2.5 – 16T Tracked Excavator *(cleaning site)*	98	90	92	88	87	86	93	85	**96**
C.2.8: Wheeled backhoe loader *(cleaning site)*	94	86	84	84	83	80	79	70	**88**
C2.21 – 22T Tracked Excavator *(excavation/earthworks)*	95	96	92	88	85	83	77	69	**91**
C2.28 – Wheeled Loader *(loading lorries)*	106	102	97	94	90	86	82	75	**96**
C2.37 – Roller (rolling fill) *(rolling & compacting)*	92	95	101	98	94	90	83	75	**99**
C.4.18 – Cement mixer truck – discharging *(Mixing concrete)*	100	89	86	90	91	89	84	78	**95**
Resultant Noise Level	**108**	**104**	**103**	**101**	**98**	**95**	**94**	**87**	**103**

6.3.2 Park Activity Noise

Current Park Activity Noise
The existing Hanover Park predominantly consists of a large grassy area with a small volume of trees, a single footpath, a U-shaped bridge and a small concrete bandstand type structure.

There are currently no permanent noise sources within the park (i.e. electrical equipment, motors or sound systems). There are also no playground structures within the park with the potential to wear-out or malfunction resulting in a noise source (i.e. swings, merry-go-rounds or seesaws). Therefore, the only occasion when the park contains a noise source is when people are present.

The level of noise resulting from the presence of people can vary depending on the activity that they are engaged in. For example, two individuals having a picnic would generate a very low noise levels, a single individual playing music on a portable device would create a low to moderate noise level, whereas multiple people involved in a game of football could create high levels of noise.

Proposed Park Activity Noise
The proposed redevelopment of the park would include:

- Upgrade the existing paths/trails to separate Youth Cyclist Trails with younger Bike Skills Features.
- Mountain Bike Pump Track.
- Develop Biodiversity & Wild Flower Garden Theme Throughout.
- Develop a Natural Playground Activity Area with Natural Materials
- Develop an Outdoor Classroom / Theatre Area and upgrade the Existing Band Stand
- A Mini-Basketball Court

Based on the type of proposed activity within the redeveloped park, it is anticipated that the predominant noise source would result from the collective activity of multiple youths (i.e. raised voices, shouting, laughing etc.).

A prediction of the noise level from this type activity has been made using a previous measurement at school playground with 200 primary school pupils during a typical lunch hour. The playground measured approximately 48m x 25m. The monitoring position was 15m from the perimeter of the playground and the measured Leq(1hr) was determined to be 66.5 dB(A).

The residual noise level, when the playground was not in use was in excess of 10 dB less than the measured value when in use, therefore the level of 66.5 dB has been used as the playground activity noise level for 200 children.

It is likely that the proposed park would cater for a maximum of 50 children at one time, therefore, it is a reasonable assumption that the noise level generated at a distance of 15m from the perimeter of the proposed park is 6 dB lower (60.5 dB) using basic principles of acoustics.

Table 6.4: Noise Levels from Park Use

Distance	Number of Youths		
	200	100	50
15 m	67 dB	64 dB	61 dB
1 m	90 dB	87 dB	84 dB

7.0 RESULTS

7.1 SCREENING - RESULTS

7.1.1 Quiet Area Screening

The location of the development has been screened in order to determine if it is located in an area that could be considered a 'Quiet Area' according to the EPA NG4 Guidance, which states:

The location of the proposed development should be screened in order to determine if it is to be located in or near an area that could be considered a 'Quiet Area' in open country according to the Agency publication Environmental Quality Objectives - Noise in Quiet Areas.

This is achieved using the following checklist:

Table 7.1: Quiet Area Screening Checklist

Screening Question	Answer	
	Yes	No
Is the site >3km away from urban areas with a population >1,000 people?		✓
Is the site >10km away from urban areas with a population >5,000 people?		✓
Is the site >15km away from urban areas with a population >10,000 people?		✓
Is the site >3km away from any local industry?		✓
Is the site >10km away from any major industry centre?		✓
Is the site >5km away from any national primary route?		✓
Is the site >7.5km away from any motorway or dual carriageway?		✓
QUIET AREA?		✓
Other Relevant Comments	Carlow (pop: 24,272) – Located Within. Carlow Town contains local industry. Carlow Town contains major industry. N80 primary route – 1.03km East. M9 Motorway – 4.75km Southeast.	

7.1.2 Areas of Low Background Noise Screening

When an area is not identified as being *a 'Quiet Area'*, the existing background noise levels measured during the environmental noise survey should be examined to determine if they satisfy the following criteria:

- Average Daytime Background Noise Level ≤ 40dB L_{AF90}
- Average Evening Background Noise Level ≤ 35dB L_{AF90}
- Average Night-time Background Noise Level ≤ 30dB L_{AF90}

Noise monitoring has indicated that the average daytime background L_{AF90} noise levels did not fall below the levels outlined in Step 3, Chapter 4.4.2 of the EPA *Guidance Note on Noise from Scheduled* Activities (NG4), during the monitoring periods.

Table 7.2: Low Background Noise Screening Table

Reference	Leq dB(A)	L_{90} dB(A)
NM1	54	47
NM2	60	49
NM3	61	52
NM4	52	51
NM5	50	47
NM6	55	50
Total Average	–	**50**

$$\text{Average} = 10.\text{Log}\frac{1}{n}\sum_{i=1}^{n} 10^{Lp/10}$$ When Lp = Noise Level Recorded

7.2 BASELINE NOISE ASSESSMENT – RESULTS

Tables 7.3 below show the daytime measurement results taken at the six noise monitoring locations (NM's) outlined in Section 6.1. These points are mapped in Appendix B.1.

Night-time monitoring was not conducted as park activities are not anticipated to occur during these hours (23:00 – 07:00 hrs).

Associated particulars such as a description of the noise environment, dominant noise sources and any interferences/background noise recorded are also provided in the table.

Nial Ryan of Panther Environmental Solutions Ltd conducted the baseline noise assessment.

For this assessment, the monitoring was carried out on Tuesday 5th January 2021.

The L_{90} noise monitoring parameter filters out intermittent sources and may give the best representation of the baseline background noise level in the absence of intermittent noise events such as passing traffic.

Table 7.3: Baseline Noise Monitoring Summary Table

Ref	Time	Leq	L_{10}	L_{90}	Background Noise Sources
NM1	15:47	54	57	47	• Carpark – Moderate/Intermittent Traffic (x9). • R448 Roadway – Low/Intermittent Traffic Noise. • R448 Roadway – Moderate/Intermittent HGV's. • Roadways – Faint/Intermittent Vehicles Horn. • Carpark – Low/Intermittent Vehicles Radio. • Dogs – Faint/Intermittent Barking. • Air Handling Units – Faint/Continuous Blowing Air Noise. • Pedestrians – Low/Intermittent Raised Voices on Footpaths. • Cathedral – Low/Intermittent Church Bells. • Vacant Industrial Unit– Faint/Continuous Internal Alarm or Worn Bearing Noise.
NM2	15:29	60	64	49	• R448 Roadway – Moderate/Intermittent Traffic Noise. • R448 Roadway – Loud/Intermittent HGV's. • Roadways – Faint/Intermittent Vehicles Horn. • Local Road – Loud/Intermittent Traffic (x8). • Birds – Faint/Intermittent Bird Song and Crow Calls/. • Dogs – Moderate/Intermittent Barking. • Pedestrians – Low/Intermittent Raised Voices and Whistling on Footpaths.
NM3	15:12	61	64	52	• R448 Roadway – Moderate/Intermittent Traffic Noise. • R448 Roadway – Loud/Intermittent HGV's and Tractors. • Roadways – Faint/Intermittent Vehicles Horn. • Local Road – Loud/Intermittent Traffic (x3). • Birds – Low/Intermittent Bird Song. • Dogs – Faint/Intermittent Barking. • Pedestrians – Low/Intermittent Raised Voices on Footpaths.
NM4	14:18	52	53	51	• River Burren – Low/Continuous Flowing Water Noise. • R448 Roadway – Low/Intermittent Traffic Noise. • Kennedy Avenue Roadway– Faint/Intermittent Traffic Noise. • Air Handling Units – Low/Continuous Blowing Air Noise. • Birds – Low/Intermittent Bird Song and Crow/Magpie Calls.

Table 7.3: Baseline Noise Monitoring Summary Table

Ref	Time	Leq	L_{10}	L_{90}	Background Noise Sources
					• Dogs – Faint/Intermittent Barking. • HGV – Faint/Intermittent Reversing Signal. • Carpark – Low/Intermittent Vehicles Engine Noise. • Carpark – Low/Intermittent Vehicles Door Banging. • Carpark – Low/Intermittent Raised Voices. • Carpark – Low/Intermittent Vehicles Radio. • Carpark & Roadways – Low/Intermittent Vehicles Horn.
NM5	14:34	50	53	47	• River Burren – Low/Continuous Flowing Water Noise. • R448 Roadway – Low/Intermittent Traffic Noise. • R448 Roadway – Faint/Intermittent Traffic Light Signal Noise. • Air Handling Units – Faint/Continuous Blowing Air Noise. • Birds – Low/Intermittent Bird Song and Crow Calls. • Dogs – Faint/Intermittent Barking. • Carpark – Low/Intermittent Vehicles Door Banging. • Carpark/footpaths – Low/Intermittent Raised Voices. • Carpark & Roadways – Low/Intermittent Vehicles Horn. • Residences – Low/Intermittent Glass Bottle Knocking/Recycling.
NM6	14:54	55	57	50	• River Burren – Moderate/Continuous Flowing Water Noise. • R448 Roadway – Moderate/Intermittent Traffic Noise. • R448 Roadway – Loud/Intermittent HGV's and Busses. • R448 Roadway – Low/Intermittent Traffic Light Signal Noise. • R448 Roadway – Low/Intermittent Vehicles Horn. • Birds – Faint/Intermittent Bird Song. • Cathedral – Low/Intermittent Church Bells. • Construction – Faint/Intermittent Concrete Hammering/Chiseling Noise. • Residences – Low/Intermittent House Door Banging.

7.3 PREDICTIVE ANALYSIS - RESULTS

7.3.1 Proposed Park Activities

In order to determine the potential impact of noise from the proposed redeveloped park during activities, the resultant noise levels at the five defined noise sensitive receptors have been calculated.

As the monitored Leq noise levels at noise monitoring locations are influenced by intermittent noise events, in particular traffic. The predicted noise impact from the use of the redeveloped park have been calculated and are basis on the assembly of 50 youths.

Table 7.4 below summarises the findings of this assessment of the proposed park development. Detailed calculations may be found in Appendix C below.

Table 7.4: Predicted Noise Results Summary (dBA)		
Ref	**Location**	**Proposed Park Activity Noise**
Source Noise Level (dBA)		84
NSR1	NSR 143m West	41
NSR2	NSR 97m Southwest	44
NSR3	NSR 64m South	48
NSR4	NSR 58m Northeast	49
NSR5	NSR 59m Northeast	49

Distances referenced in Table 7.4 above are between the central point of the proposed redevelopment site and the closest noise sensitive receptors (NSR's).

<u>BS4142:2014 Assessment</u>

The methodology outlined in BS4142 requires that predicted noise levels be compared to existing L_{90} figures at noise sensitive locations in order to determine the likely noise impact.

No noise character penalty has been applied to the park activities noise levels, as there are no plans to install permanent equipment as part of the proposed redevelopment.

The following table determines the impacts from the proposed park activities noise levels at sensitive receptors following the BS4142 methodology, using L_{90} measurements taken at the noise monitoring locations (NM's).

Table 7.5: BS4142 Park Activity Noise Assessment (Proposed) vs Background L_{90}					
Location	NM (L_{90})	Predicted Noise			Difference
		Predicted Noise	Predicted Penalty	Rating Level	
NSR1	47	41	+0	41	-6
NSR2	49	44	+0	44	-5
NSR3	52	48	+0	48	-4
NSR4	49	49	+0	49	-1
NSR5	49	49	+0	49	0

The above scenario utilizes a noise source level resulting from the activity of group of 50 youths located at a park central point. A central point was used, as it would be a reasonable assumption that the 50 individuals would be spread throughout the park area in smaller groups, as the proposed redevelopment feature would have a limited capacity (i.e. cycle trails, pump track, mini-basketball court etc.).

It would be considered an unlikely scenario for a group of this size to gather at a single point.

7.4.2 Construction Phase

In order to determine the impact of noise from the proposed development during the construction phase, the resultant noise levels at the five defined noise sensitive receptors have been calculated.

Table 7.7 below summarises the findings of this assessment of the existing development. Detailed calculations may be found in Appendix C below.

Table 7.7: Predicted Noise Results Summary (dBA) – Construction		
Ref	**Location**	**Park Activity Noise**
Source Noise Level (dBA)		**103**
NSR1	NSR 143m West	60
NSR2	NSR 97m Southwest	63
NSR3	NSR 64m South	67
NSR4	NSR 58m Northeast	68
NSR5	NSR 59m Northeast	68

Distances referenced in Table 7.7 above are between the central point of the proposed redevelopment site and the closest noise sensitive receptors (NSR's).

BS4142:2014 Assessment

The methodology outlined in BS4142 requires that predicted noise levels be compared to existing L_{90} figures at noise sensitive locations in order to determine the likely noise impact.

A noise character penalty of +5 dB has also been applied to construction noise levels to account for potential distant tonal noise from equipment.

The following table determines the impacts from the potential construction noise levels at sensitive receptors following the BS4142 methodology, using L_{90} measurements taken at the noise monitoring locations (NM's).

Table 7.8: BS4142 Construction Noise Assessment vs Background L_{90}					
Location	**NM (L_{90})**	**Predicted Noise**			**Difference**
		Predicted Noise	**Predicted Penalty**	**Rating Level**	
NSR1	47	60	+5	65	18
NSR2	49	63	+5	68	19
NSR3	52	67	+5	72	20
NSR4	49	68	+5	73	23
NSR5	49	68	+5	73	24

8.0 DISCUSSION

8.1 SCREENING – DISCUSSION

8.1.1 Quiet Area Screening

The proposed development location does not comply with all criteria, as per the checklist outlined in Table 7.1. Therefore, it is considered that the development would not be located within a '*Quiet Area*'.

8.1.2 Areas of Low Background Noise Screening

Noise monitoring has indicated that background L_{AF90} noise levels do not fall below the levels outlined in Step 3, Chapter 4.4.2 of the EPA document *Guidance Note on Noise (NG4)*, as per Section 7.1 above.

Given the noise monitoring results obtained and the character of the area, it is unlikely that this area would be considered a '*Low Background Noise Area*'.

Therefore, the following noise guidance limits would be applicable to the park;

Table 8.1: Typical Noise Limits

Period	Limit
Daytime (07:00 to 19:00hrs)	55 dB(A)
Evening (19:00 to 23:00hrs)	50 dB(A)
Night-time (23:00 to 07:00hrs)	45 dB(A)

These limits are widely accepted throughout Ireland and are used as the standard for noise control for a range of applications.

8.2 BASELINE NOISE ASSESSMENT - DISCUSSION

NM1

- This monitoring location was chosen to give a representation of the existing noise environment in the vicinity of NSR1.
- No park activity was audible during the monitoring period.
- The noise environment was generally influenced by intermittent sources, including: dog barking, bird song, church bells, nearby Air Handling Units and an alarm/worn bearing type noise from within the adjacent vacant unit.
- Vehicle passing on roadways, within carparks and in the distance were the dominant noise sources at this location.
- The Leq at this location was determined to be 54 dB(A).
- The background noise level (L_{90}) was determined to be 47 dB.

NM2

- This monitoring location was chosen to give a representation of the existing noise environment in the vicinity of NSR2.
- No park activity was audible during the monitoring period.
- The noise environment was generally influenced by intermittent sources, including: dog barking, bird song and talking pedestrians on nearby footpaths.
- Vehicle passing on R448 and with the residential area were the dominant noise sources at this location, in particularly HGV's.
- The Leq at this location was determined to be 60 dB(A).
- The background noise level (L_{90}) was determined to be 49 dB.

NM3

- This monitoring location was chosen to give a representation of the existing noise environment in the vicinity of NSR3.
- No park activity was audible during the monitoring period.
- The noise environment was generally influenced by intermittent sources, including: dog barking, bird song and talking pedestrians on nearby footpaths.
- Vehicle passing on R448 and with the residential area were the dominant noise sources at this location, in particularly HGV's and Tractors.
- The Leq at this location was determined to be 61 dB(A).
- The background noise level (L_{90}) was determined to be 52 dB.

NM4

- This monitoring location was chosen to give a representation of the existing noise environment in the vicinity of NSR4.
- No park activity was audible during the monitoring period.
- The noise environment was generally influenced by intermittent sources, including: dog barking, bird song, raised voiced, a flowing water noise from the adjacent River Burren and nearby Air Handling Units.
- Vehicle passing on roadways, within carparks and in the distance were the dominant noise sources at this location.
- The Leq at this location was determined to be 52 dB(A).
- The background noise level (L_{90}) was determined to be 51 dB.

NM5

- This monitoring location was chosen to give a representation of the existing noise environment in the vicinity of NSR4 and NSR5.
- No park activity was audible during the monitoring period.
- The noise environment was generally influenced by intermittent sources, including: dog barking, bird song, raised voiced, a flowing water noise from the adjacent River Burren, glass recycling, a traffic light signal and nearby Air Handling Units.
- Vehicle passing on roadways and in the distance were the dominant noise sources at this location.
- The Leq at this location was determined to be 50 dB(A).
- The background noise level (L_{90}) was determined to be 47 dB.

NM6

- This monitoring location was chosen to give a representation of the existing noise environment in the vicinity of NSR6.
- No park activity was audible during the monitoring period.
- The noise environment was generally influenced by intermittent sources, including: bird song a flowing water noise from the adjacent River Burren, church bells and a traffic light signal.
- Vehicle passing on roadways and in the distance were the dominant noise sources at this location, in particularly HGV's and Busses.
- The Leq at this location was determined to be 55 dB(A).
- The background noise level (L_{90}) was determined to be 50 dB.

8.3 PREDICTIVE NOISE ASSESSMENT - DISCUSSION

The area surrounding the Hanover Park is predominantly urban in nature, with the park being bound to the west by a large carpark with access road, by the R448 regional road to the south and southeast beyond which are residential properties and to the north by the River Burren beyond which is the residential properties and commercial units.

The principal factor influencing the mitigation of noise from the proposed development is its distance from noise sensitive receptors. Increasing distance from a noise source significantly increases the attenuation of noise as sound energy reduces by the inverse of the square of distance travelled (inverse square law).

8.3.1 Impact Rating

BS4142 infers that, for a given excess of the rating level over the background level, the impacts and potential likelihood of complaints are as follows:

Table 8.2: BS4142 Impact Criteria

Excess	Likelihood	Interpretation of Impact
+ 10dB	Likely	An indication of a *significant adverse impact*.
+ 5dB	Possible	An indication of an *adverse impact*.
≤ 5 dB	Unlikely	An indication that it is *unlikely* that the specific sound source will have an *adverse impact or a significant adverse impact.*
< 0dB	Very Unlikely	An indication that the specific sound source will have a *low impact.*

Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.

Based on this rating system the following has been utilised for this assessment:

- Typically, the greater this difference, the greater the magnitude of the impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level; the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

It should be noted that the BS4142 impact assessment criteria is intended for use in the assessment of industrial activities.

8.3.2 Proposed Park Activities

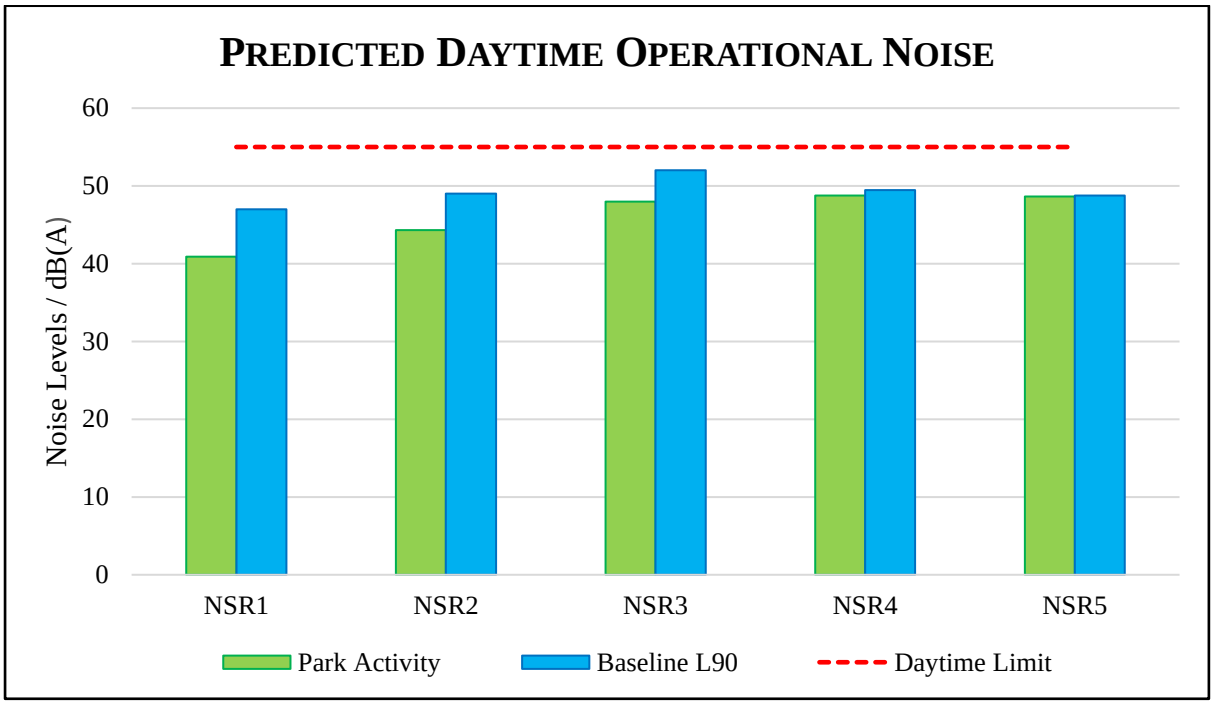

Figure 8.1: Proposed Park Activity Noise vs. Existing Baseline Noise (L_{90})

As can be seen in **Figure 8.1** and **Table 7.5** above, daytime noise levels arising from the proposed park activity at noise sensitive receptors, were predicted to be between -6 dB below and equal to the existing background noise levels(L_{90}) at noise monitoring (NM) locations.

None of the predicted noise levels were 5 dB or greater above the background noise level (L_{90}) measured. Therefore, the proposed park activity noise levels would not have a significant adverse impact or an adverse impact during daytime at noise sensitive receptors, as per BS4142 impact criteria outlined in Section 8.3.1.

The predicted noise levels at NSR locations were determined to be between -6 dB below or equal to the background noise levels (L_{90}) at NM locations, indicating that the proposed park activities would create little to no impact, as per BS4142 impact criteria.

Additionally, predicted noise levels at all noise sensitive receptors have been determined to range between 41 de and 49 dB, which would comply with the recommended daytime limit of 55 dB outlined in the EPA Guidance document in *Relation to Scheduled Activities (NG4)*.

Therefore, it is predicted that the proposed park activities would not have an impact at any of the surrounding noise sensitive receptors.

The results of this predicted noise assessment should be considered an over-estimate as there have not been any corrections made to the predicted noise levels for all sound attenuating effects such as sound degradation from ground absorption, air absorption, reflections and attenuation by surfaces, foliage and topography.

8.3.3 Construction Noise

It is anticipated that peak construction noise would be a dominant source of noise at the closest noise sensitive receptors during such works, with the character of construction type noise being more clearly audible during intermittent impulsive noise events.

It should be noted that these peak noise levels would occur only for short periods during the construction phase. The construction phase itself would be temporary in nature. Therefore, these peak noise works would be for limited periods of workdays and only during the construction phase of the project.

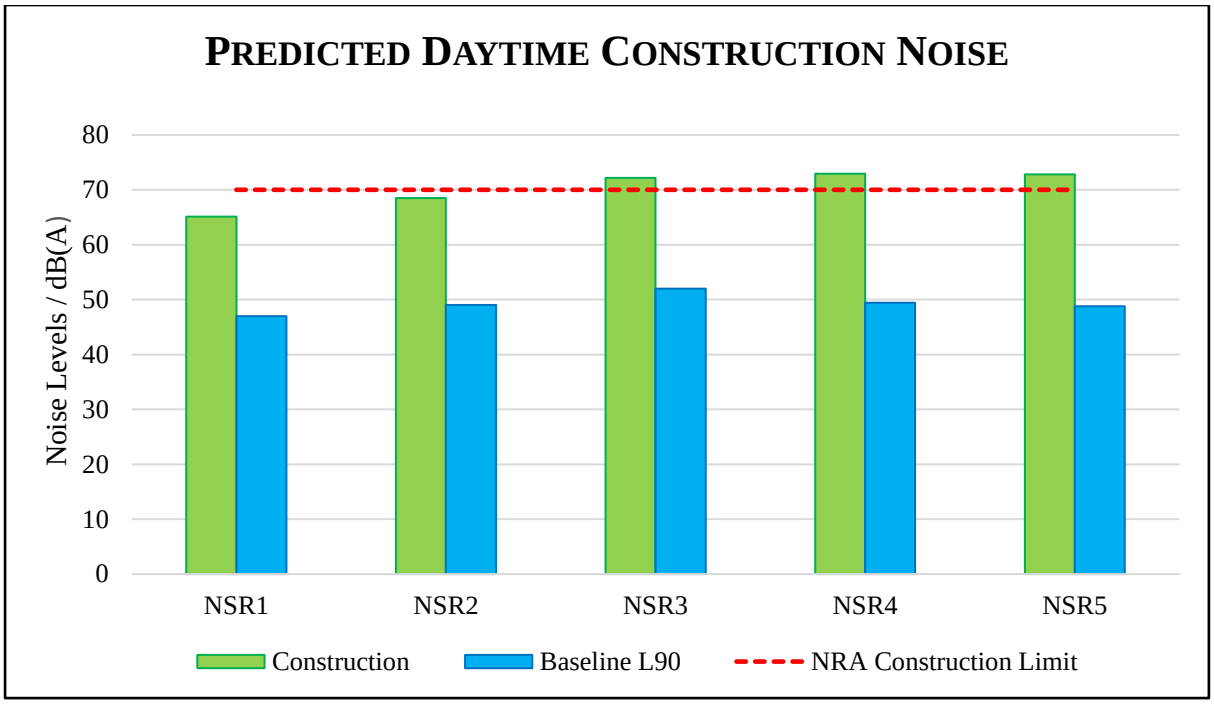

Figure 8.3: Predicted Construction Noise vs. Existing Baseline Noise (L_{90})

As can be seen in **Figure 8.3** and **Table 7.8** above, daytime noise levels arising from the construction phase at noise sensitive receptors, were calculated to be between 18 dB and 24 dB above the existing background noise levels (L_{90}) at noise monitoring (NM) locations.

This indicatates that the potential construction noise would have a significant adverse impact, as per BS4142 impact criteria outlined in Section 8.3.1.

It should be noted that the theoretical peak noise level is a worst-case scenario and it would be unlikely that all site works would occur concurrently.

A noise character penalty of +5 dB has also been applied to predicted noise levels containing machine noise. This is to account for potential distant impulsive noise from operating machinery.

Predicted construction noise levels at two of the five noise sensitive receptors (NSR1 and NSR2) have been determined to comply with the NRA guidance limit of 70 dB(A) for construction activity during weekdays (Monday – Friday).

Predicted construction noise levels at the other three noise sensitive receptors (NSR3, NSR4 & NSR5) were determined to be between 2 dB and 3 dB above the NRA guidance limit of 70 dB(A) for construction activity during weekdays (Monday – Friday).

Construction noise levels were determined using distance calculations from a central point from the proposed construction site to the NSR's. It is anticipated that the above calculations are an over-estimate as they do not take into consideration existing noise barriers in the vicinity of the park and the lower elevation of the park in relation to a number of the NSR's.

Between NSR1 and the proposed redevelopment site, there is a substantial concrete wall (see Figure F.7 of Appendix F). Between the Riverside residential area, containing NSR2 and NSR3, and the proposed redevelopment site, there are two medium sized walls, one on the parks southern boundary and the other on Riversides northern boundary (see Figure F.8 – F.10 of Appendix F). These barriers would reduce the impact of potential construction noise to levels below the NRA guidance limit of 70 dB(A) at all NSR locations.

It should be noted that these noise levels are considered a worst-case scenario, as it assumes that the noisiest operations are carried out simultaneously (i.e. each piece of equipment listed in Table 6.3 operation at one time). This event would be anticipated to be a rare occurrence and only for short periods of the construction phase.

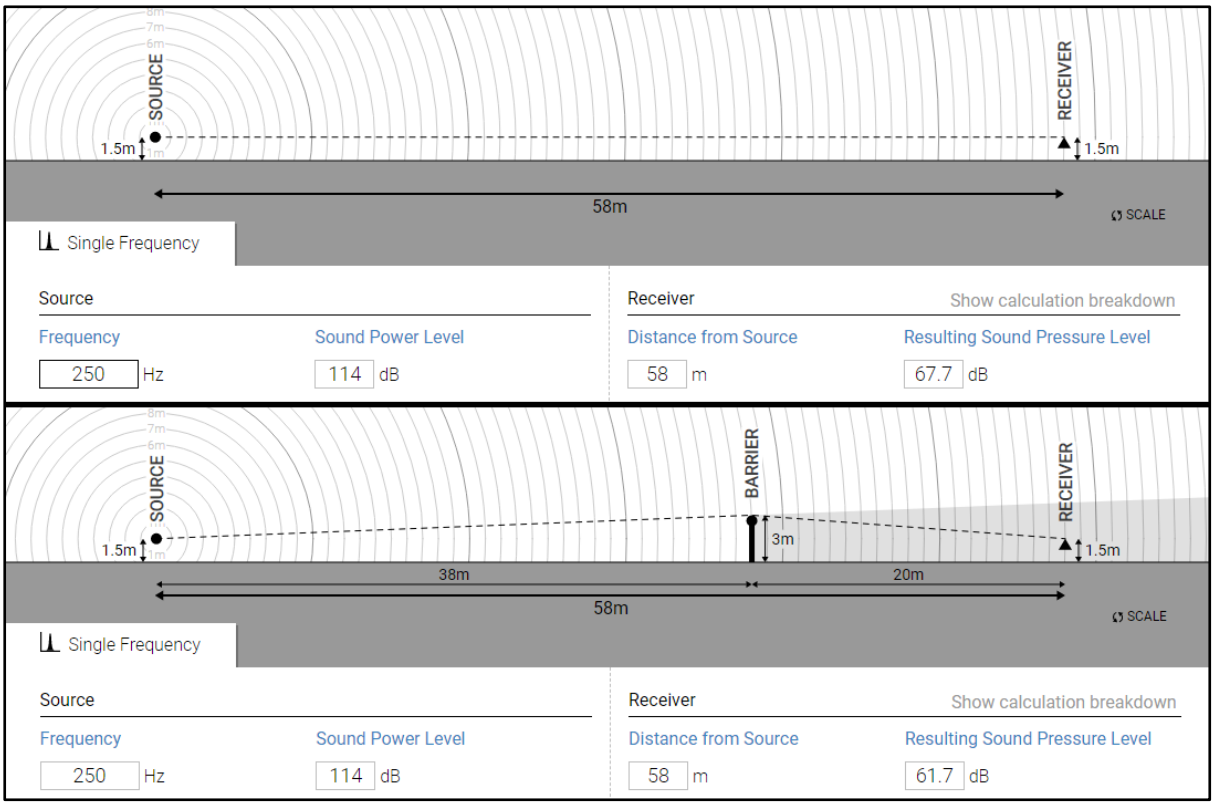

Figure 8.4: Example of Barrier Attenuation

A noise barrier can provide noise attenuation of 10 dB. As can be seen in the diagram above, a source power level L_w of 114 dB (or pressure L_p of 103 dB) would result in a noise level of 68 dB at the receptor, similar to NSR4 and NSR5.

The installation of a 3-meter high noise barrier at a distance of 20m from the receptors would result in a reduction of 6 dB. When a +5 dB penalty is applied, this would result in a noise level of 67 dB at NSR4 & NSR5, which would comply with the NRA guidance levels of 70 dB.

A distance of 20-meters from the receptor to the barrier would account for the 15m width of the River Burren and a setback distance of 5m from the river's edge.

According to The National Roads Authority's '*Guidelines for the Treatment of noise and vibration in National Road Schemes*' (2004), noise levels at noise sensitive locations of 70 dB(A) L_{Aeq} between daytime hours (07:00-19:00) and 60 dB(A) L_{Aeq} between evening (19:00-22:00 hours) are considered to be acceptable.

It is anticipated that construction activities would generally be conducted between the hours of 07:00am and 19:00pm Monday to Friday.

Predicted noise levels from the construction phase of the redevelopment are not anticipated to exceed the NRA guidance levels once the below recommendations in section 10 are adhered to.

9.0 CONCLUSIONS

As a result of this baseline noise survey and predictive analysis on the potential impact of the proposed development on noise at sensitive receptors, the following conclusions have been made;

- The baseline assessment indicates that current park activities are not causing a nuisance at noise sensitive locations in the vicinity of the existing park.

- Monitored background noise levels (L_{90}) at the six monitoring locations ranged between 47 dB and 52 dB.

- Existing noise levels at the monitoring locations were dominated by non-park related traffic noise and other eternal noise sources.

- None of the predictive park activity noise levels were 5 dB or greater above the measured background noise level measures. Therefore, the proposed park activity noise levels are not anticipated to have a significant adverse or adverse impact during daytime at noise sensitive receptors.

- Predictive park activity noise levels were calculated to range between 41 dB and 49 dB at the closest noise sensitive receptors, which are below the recommended EPA daytime limit of 55 dB.

- Predictive park activity noise levels were also calculated to range 0 dB and –6 dB below the corresponding background noise level, indicating that the proposed park activities would create little to no impact, as per BS4142 impact criteria.

- Daytime noise levels arising from the construction phase at noise sensitive receptors, were calculated to be between 18 dB and 24 dB above the existing background noise levels (L_{90}) at noise monitoring (NM) locations.

- Predicted construction noise levels at two of the five noise sensitive receptors (NSR1 and NSR2) have been determined to comply with the NRA guidance limit of 70 dB(A) for construction activity during weekdays (Monday – Friday).

- Predictive construction noise levels were calculated to range between 65 dB and 73 dB at the closest noise sensitive receptors, which includes a +5 dB noise character penalty account for potential distant tonal noise from equipment.

- It has been calculated that a 3-meter height temporary barrier, erected on the northern park boundary, would reduce construction noise levels by 6 dB, resulting in compliance NRA guidance limit of 70 dB(A) at NSR4 & NSR5.

- It is anticipated that construction activities would generally be conducted between the hours of 07:00am and 19:00pm Monday to Friday. Predicted noise levels from the construction phase of the redevelopment are not anticipated to exceed the NRA guidance levels once the below recommendations are adhered to.

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10.0 RECOMMENDATIONS

Implement noise control measures during the construction phase and park activities phase of the project. This should include:

1. A temporary noise barrier should be erected on the sites northern boundary, at a distance of 20m (accounting for the 15m width of the River Burren and a 5m setback distance) from NSR4 and NSR5, during the construction period in order to comply with the NRA guidance limit of 70 dB(A).

2. All construction activities should take place between 7:00am and 19:00pm, Monday to Friday. Any works that, by necessity, are required to be carried out outside of these times should be notified to any potentially effected local residents in good time and prior to specified works commencing.

3. It is recommended that guidance on control of noise, as per The National Roads Authority's '*Guidelines for the Treatment of noise and vibration in National Road Schemes'* (2004) and British Standard 5228-1 *'Code of practice for Noise Control on Construction and Open Sites'* be followed during the construction phase.

4. Inform on-site workers, hauliers and contractors of noise considerations on-site and on public access roads.

5. Timely and adequate maintenance of all construction equipment, including preventative maintenance, to ensure efficient operation and minimisation of potential noise.

11.0 REFERENCES

EPA, *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)*, 2016.

EPA, *Environmental Noise Survey Guidance Document*, 2003.

ISO 9613-2:1996 *Attenuation of Sound during Propagation Outdoors*.

EN BS 4142:2014 *Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas*".

EN BS 5228-1:2009 *Code of practice for noise and vibration control on construction and open sites*.

National Roads Authority, *Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes*, 2014.

Grant S. Anderson and Ulrich J. Kurze, *Outdoor Sound Propagation*, Chpt. 5 in Noise and Vibration Control Engineering – Principals and Applications, edited by L.L. Beranek and I.L. Vér, (John Wiley & Sons, NY, NY 1992).

Nottinghamshire County Council, *Beardall Primary School Hucknall Noise Impact Assessment*, June 2013.

APPENDIX A

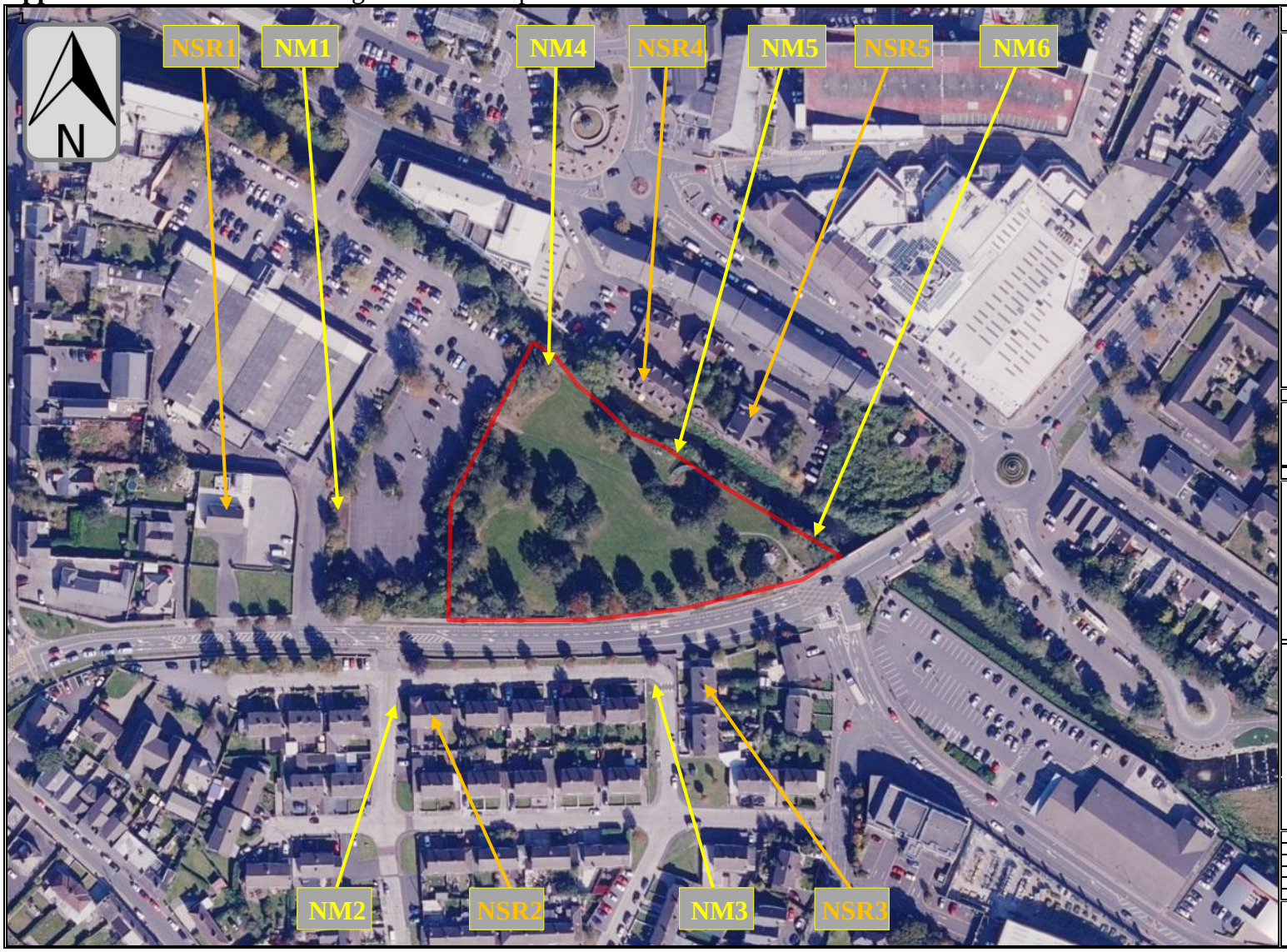
- PROPOSED DEVELOPMENT LAYOUT -


PROPOSED WILD FLOWER & BIODIVERSITY GARDEN AREA
RETAIN BAT FRIENDLY TREES LINE & DEVELOP A WOODLAND AREA
PROPOSED FUTURE WILD FLOWER & BIODIVERSITY GARDEN AREA
YOUTH BIKE SKILLS TRACKS AND FEATURES
YOUTH BIKE SKILLS AREAS
www.shoretrax.com
Penny's Car Park
PROPOSED FUTURE KIDS NATURAL PLAY PARK AREA
NEW LED TRAIL PUBLIC LIGHTS
10M WIDE WILD FLOWER & BIODIVERSITY BUFFER ZONE ON RIVER BANK
CREATE NEW OTTER HABITAT DENS
EXISTING BRIDGE VIEWING PLATFORM
Burrin River
PROPOSED 2.2M WIDE JUV CYCLING/EXERCISE SHARED TRACKS
PROPOSED KIDS NATURAL PLAY & EXPLORE AREAS
MINI-BASKETBALL COURTS
EXISTING LIGHTS TO BE UPGRADED
PROPOSED OUTDOOR CLASSROOM AND MIXED USE THEATRE AREA
UPGRADE EXISTING BAND STAND
MOUNTAIN & BMX BIKE PUMP TRACK
NEW LED TRAIL PUBLIC LIGHTS
NEW LED TRAIL PUBLIC LIGHTS
PROPOSED 2.2M WIDE JUV CYCLING/EXERCISE SHARED TRAILS
SUPPLY & LAY CAST INSITU KERB
PROPOSED CARPARK FOR 10 CARS
NEW ACTIVE TRAVEL SHARED PEDESTRIAN CYCLE TRACKS
NEW OFF-ROAD SHARED PEDESTRIAN CYCLE TRACKS
R448
Riverside
32
31
21
22
NOTES
1. This drawing is the property of Carlow County Council, it is a confidential document and must not be copied, used, or its content divulged without prior written consent.
2. DO NOT SCALE, use figured dimensions only, if in doubt ask.
Brief Specification
Upgrade 430m of 2.2m avg width cycle trails for young kids to learn in a safe off-road environment. Trails can also be used for walking and running by any age group and will incorporate Bike Skills features.
Wild Flower & Biodiversity garden areas and 10m buffer zone to the Burrin River. Trails will have information and education sign boards for everyone to enjoy.
Construct a Pump Track for Mountain & BMX bikes for older teeenagers in the centre of the park.
Construct a Natural Play Park area with trails, tunnels, slides and climbing features with natural materials.
Create a Strong theme on wildlife / biodiversity and amenity side by side for enjoyment and education of all.
Accessable for all right in the Middle Of Carlow Town.
Legend
Existing Light Pole
Existing Tree
Ordnance Survey
Includes Ordnance Survey Ireland data reproduced under Osi Licence Number 2008/10 CCMA Carlow County Council. Unauthorised reproduction infringes Ordnance Survey Ireland and Government of Ireland Copyright © Ordnance Survey Ireland 2008
No. Date Amendment / Issue App
A 00/00/00 XXXXXXXXXXXXXXX P.O
CARLOW COUNTY COUNCIL
CARLOW MUNICIPAL DISTRICT
Director Of Services: Padraig O'Gorman
County Hall, Athy Road, Carlow
Phone: (059)9170300 Fax: (059)9138206
Email: secretar@carlowcoco.ie
Carlow Local Authorities, A CPD Accredited Company
Project:
CARLOW MUNICIPAL DISTRICT ACTIVE TRAVEL 2020
Title:
Proposed Hanover Activity & Bike Park - Incl Youth Bike Skills Park Pump Track Natural Play Park and Biodiversity Gardens Proposed Layout
Drawn by: Ciaran Brennan
Job No: 2020 Active Travel
Checked by: Gerr O'Brien
Dwg Loc
Approved by: Padraic O'Gorman
Dwg No: Section 3 1 of 1
Rev: A
Scale: 1:250 @A1
Date: 19/11/2020

APPENDIX B

- NOISE MONITORING LOCATION MAPS -

Appendix B.1: Noise Monitoring Locations Map



Notes

– Park Boundary

NM – Noise Monitoring Location

NSR – Noise Sensitive Receptor

Project Title:

Noise Monitoring Location Map

Client Name:

CARLOW COUNTY COUNCIL

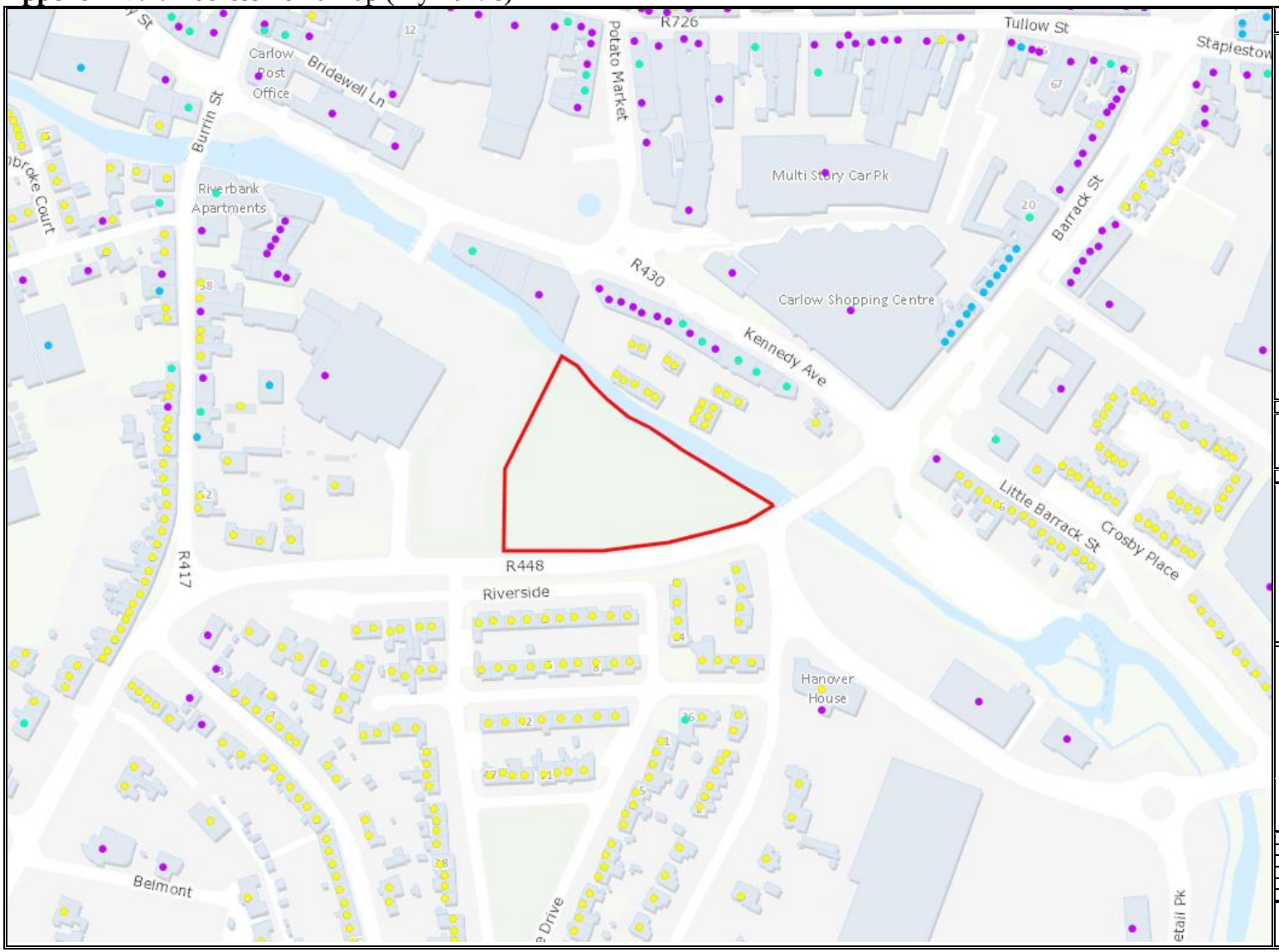
PANTHER ENVIRONMENTAL SOLUTIONS LTD

UNITS 3 & 4
INNOVATION CENTRE
GREEN ROAD
CARLOW
R93 W248

TELE: 059 91 34222
MOBILE: 087 851 9284
EMAIL:info@pantherwms.com
WEB: www.pantherwms.com

Drawing Status:	Scale:	NTS	A4
Report	Datum:	Google Pro	
Drawing Number:	Drawn:	NR	
	Checked:	MF	
Revision:	Approved:	-	
R0	Date:	10/12/2019	

Appendix B.2: Address Point Map (MyPlan.ie)



Notes

– Park Boundary

- Commercial
- Residential
- Residential and Commercial
- Unknown

Project Title:

Address Point Map

Client Name:

CARLOW COUNTY COUNCIL

PANTHER ENVIRONMENTAL SOLUTIONS LTD

UNITS 3 & 4
INNOVATION CENTRE
GREEN ROAD
CARLOW
R93 W248

TELE: 059 91 34222
MOBILE: 087 851 9284
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Drawing Status:	Scale:	NTS	A4
Report	Datum:	Google Pro	
Drawing Number:	Drawn:	NR	
	Checked:	MF	
Revision:	Approved:	-	
R0	Date:	10/12/2019	

APPENDIX C

- PREDICTIVE NOISE CALCULATIONS -

C.1: Proposed Park Activity Noise Attenuation Calculations

Receptor			Source				Divergence		L_p (dB)
$Ref_{(R)}$	X	Y	$Ref_{(S)}$	X	Y	$L_{eq(s)}$ (dB)	Distance (m)	A_{div} (dB)	
NSR1	272054	176387	SN1	272197	176385	84	143	43	**41**
NSR2	272128	176317	SN1	272197	176385	84	97	40	**44**
NSR3	272232	176332	SN1	272197	176385	84	64	36	**48**
NSR4	272200	176443	SN1	272197	176385	84	58	35	**49**
NSR5	272245	176419	SN1	272197	176385	84	59	35	**49**

Distance is between construction area central point monitoring location and closest Noise Sensitivity Receptor (NSR) locations.

$A_{div} = 20.\mathrm{Log}\,(\frac{d}{do})$ *when d = distance & d_o = 1m*

$Lp = L_{eq(S)} - A_{div}$

C.2: Potential Construction Noise Attenuation Calculations

Receptor			Source				Divergence		L_p (dB)
$Ref_{(R)}$	X	Y	$Ref_{(S)}$	X	Y	$L_{eq(s)}$ (dB)	Distance (m)	A_{div} (dB)	
NSR1	272054	176387	CN1	272197	176385	103	143	43	**60**
NSR2	272128	176317	CN1	272197	176385	103	97	40	**63**
NSR3	272232	176332	CN1	272197	176385	103	64	36	**67**
NSR4	272200	176443	CN1	272197	176385	103	58	35	**68**
NSR5	272245	176419	CN1	272197	176385	103	59	35	**68**

Distance is between construction area central point monitoring location and closest Noise Sensitivity Receptor (NSR) locations.

$A_{div} = 20.\mathrm{Log}\,(\frac{d}{do})$ *when d = distance & d_o = 1m*

$Lp = L_{eq(S)} - A_{div}$

APPENDIX D

- NOISE METER CALIBRATION CERTIFICATE -

CERTIFICATE OF CALIBRATION

ISSUED BY **Cirrus Research plc**

DATE OF ISSUE **24 July 2020** CERTIFICATE NUMBER **144105**

Cirrus Research plc
Acoustic House
Bridlington Road
Hunmanby
North Yorkshire
YO14 0PH
United Kingdom

Page 1 of 2

Approved signatory
M.Berry
Electronically signed:
M.BERRY

Sound Level Meter : IEC 61672-3:2013

Instrument information

Manufacturer:	Cirrus Research plc	Notes:
Model:	CR:171B	
Serial number:	G071199	
Class:	1	
Firmware version:	3.2.2690	

Test summary

Date of calibration: 24 July 2020

The calibration was performed respecting the requirements of ISO/IEC 17025:2017.
Periodic tests were performed in accordance with procedures from IEC 61672-3:2013.

The sound level meter submitted for testing successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about conformance of the sound level meter to the full specifications of IEC 61672-1:2013 because (a) evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to determine that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013 or correction data for acoustical test of frequency weighting were not provided in the Instruction Manual and (b) because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Notes

CERTIFICATE OF CALIBRATION

ISSUED BY **Cirrus Research plc**

DATE OF ISSUE **24/07/20** CERTIFICATE NUMBER **144104**

Cirrus Research plc
Acoustic House
Bridlington Road
Hunmanby
North Yorkshire
YO14 0PH
United Kingdom

Page 1 of 2

Test engineer:
D.Swalwell
Electronically signed:

Microphone

Microphone capsule

Manufacturer: Cirrus Research plc

Model: MK:224

Serial Number: 203537A

Calibration procedure

Date of calibration: 23 July 2020

Open circuit: 52.1 mV/Pa

Sensitivity at 1 kHz: -25.7 dB rel 1 V/Pa

The microphone capsule detailed above has been calibrated to the published data as described in the operating manual of the associated sound level meter (where applicable).

The frequency response was measured using an electrostatic actuator in accordance with BS EN 61094-6:2005 with the free-field response derived via standard correction data traceable to a National Measurement Institute.

The absolute sensitivity at 1 kHz was measured using an acoustic calibrator conforming to IEC 60942:2003 Class 1.

Environmental conditions

Pressure: 100.60 kPa

Temperature: 22.0 °C

Humidity: 57.0 %

CERTIFICATE OF CALIBRATION

ISSUED BY **Cirrus Research plc**

DATE OF ISSUE **24 July 2020** CERTIFICATE NUMBER **144103**

Cirrus Research plc
Acoustic House
Bridlington Road
Hunmanby
North Yorkshire
YO14 0PH
United Kingdom

Page 1 of 2

Approved signatory
M.Berry
Electronically signed:
M.BERRY

Sound Calibrator : IEC 60942:2003

Instrument information

Manufacturer: Cirrus Research plc **Notes:**

Model: CR:515

Serial number: 54060

Class: 1

Test summary

Date of calibration: 23 July 2020

The sound calibrator detailed above has been calibrated to the published data as described in the operating manual and in the half-inch configuration. The procedures and techniques used are as described in IEC 60942:2003 Annex B – Periodic Tests and three determinations of the sound pressure level, frequency and total distortion were made.

The sound pressure level was measured using a WS2F condenser microphone type MK:224 manufactured by Cirrus Research plc.

The results have been corrected to the reference pressure of 101.33 kPa using the manufacturer's data.

The manufacturer's product information indicates that this model of sound calibrator has been formally pattern approved to IEC 60942:2003 Annex A to Class 1. This has been confirmed with the PhysikalischTechnische Bundesanstalt (PTB).

As public evidence was available, from a testing organisation responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound calibrator fully conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, the sound calibrator tested is considered to conform to all the Class 1 requirements of IEC 60942:2003.

Notes:

APPENDIX E

- BS 5228 – SOUND LEVEL DATA TABLE -

BRITISH STANDARD

Sound level data

Ref no.	Equipment	Power rating, kW	Equipment size, weight (mass), capacity	Octave band sound pressure levels at 10 m, Hz								A-weighted sound pressure level, L_{Aeq}, dB at 10 m
				63	125	250	500	1k	2k	4k	8k	
Table C.2 Sound level data on site preparation												
	Clearing site											
5	Tracked excavator	72	16 t	78	70	72	68	67	66	73	65	76
8	Wheeled backhoe loader	62	8 t	74	66	64	64	63	60	59	50	68
	Ground excavation/earthworks											
21	Tracked excavator	107	22 t	75	76	72	68	65	63	57	49	71
	Loading lorries											
28	Wheeled loader	170	—	86	82	77	74	70	66	62	55	76
	Rolling and compaction											
37	Roller (rolling fill)	145	18 t	72	75	81	78	74	70	63	55	79
Table C.4 Sound level data on general site activities												
	Mixing concrete											
18	Cement mixer truck (discharging)	—	—	80	69	66	70	71	69	64	58	75

BS 5228-1:2009

APPENDIX F

- NOISE ASSESSMENT PHOTOS -

Figure F.1: NM1 – Within the Adjacent Carpark

Figure F.2: NM2 – Within the Riverside Residential Area

Figure F.3: NM3 – Within the Riverside Residential Area

Figure F.4: NM4 – Park Northern Most Boundary

Figure F.5: NM5 – Park North-Eastern Boundary

Figure F.6: NM6 – Park Eastern Most Boundary

Figure F.7: Wall at NSR1

Figure F.8: Park Boundary Wall from NSR2

Figure F.9: Riverside Boundary Wall from NSR3

Figure F.10: Park Boundary Wall from NSR3

Appendix F – Construction Environmental Management Plan (CEMP)

CARLOW
COUNTY COUNCIL
COMHAIRLE CHONTAE CHEATHARLOCHA

Construction Environmental Management Plan

Hanover Activity & Bike Park
Carlow Town

Prepared by: Carlow Municipal District

Contents

Introduction

Barry Knowles, Senior Executive Engineer, Carlow County Council has compiled a Construction Environmental Management Plan (CEMP) for the proposed redevelopment of Hanover Park to an Activity & Bike Park with all associated works in Carlow Town.

Purpose of the CEMP

The purpose of this CEMP is to communicate key environmental obligations that apply to all site personnel, sub-contractors and visitors to the site, while carrying out construction activities as part of the proposed development. The CEMP defines the approach to environmental management at the proposed development site, outlining the work practices, construction procedures and responsibilities to be undertaken during the construction phase. Compliance with the CEMP, the procedures, work practices and controls would be mandatory and must be adhered to by all personnel and sub-contractors employed during the construction phase. The CEMP outlines, where necessary, the control measures that are required to avoid, minimise or mitigate potential effects on the environment and surrounding area.

Live Document

The CEMP is a “live” document and would be reviewed and updated as necessary throughout the construction phase.

Communication

Upon planning approval, the applicants would appoint a construction works contractor to the proposed development. This CEMP would be communicated to all site personnel during site inductions and briefings. All site personnel would be responsible for undertaking their work in an environmentally sustainable manner and would be encouraged to provide feedback and comments on environmental performance at the site and suggestions for improvement.

The construction works contractor would appoint a Project Manager to the proposed development. Any environmental issues, accidents or incidents would be reported to the Project Manager as soon as possible, who in turn would inform the applicants.

Project Description

Location

The proposed Hanover Activity & Bike Park will comprise of the redevelopment of Hanover Park to an Activity & Bike Park in Carlow Town as shown in the location map below. The redevelopment would comprise of the following main elements;

- Provision of 3.5m accessible footpaths;
- Provision of an accessible car park for up to four vehicles;
- Provision of an accessible and inclusive playground;
- Provision of a mountain bike pump track,
- Provision of a mini-basketball court,
- Provision of public lighting.

Site Location

Construction Project Description

The construction of proposed development would be undertaken by the construction contractors, hereafter referred to as “the construction works contractor”, on behalf of Carlow County Council, hereafter referred to as “the clients”.

The vision for this urban park enhancement development is the promotion of a Natural Healthy and Active Life through Physical Activities including multi-wheeled activities and a strong emphasis on wildlife preservation, biodiversity enhancement, education, and natural play all within an urban Town Centre location. See Proposed Site Layout - Appendix A of Hanover Activity & Bike Park Project Report.

The intention is to ensure that Hanover Activity & Bike Park is fully inclusive and accessible so that people with physical and cognitive disabilities have an equal opportunity to enjoy the benefits of this outdoor amenity while preserving and enhancing the majority of the existing landscaped environment and mature planting.

This multidisciplinary approach should ensure that the development becomes a diverse, attractive, and stimulating amenity for all members of the public.

It is hoped this project will secure the future of the site and demonstrate a strong biodiversity, recreation, and amenity area within a dense urban location.

The proposed Hanover Activity & Bike Park will be comprised of the following main elements;

- Provision of 3.5m accessible footpaths;
- Provision of an accessible car park for up to four vehicles;
- Provision of an accessible and inclusive playground;
- Provision of a mountain bike pump track,
- Provision of a mini-basketball court,
- Provision of public lighting.

All of the proposed amenities and activities are aimed at improving public access, active sport and training, play and recreation for people of all ages and abilities.

The expected construction timeframe would be approximately four months, with hours of operation from 7am to 7pm Monday to Friday. A designated waste area and designated area of any waste materials located away from the River Burren and any drainage system would be established by the construction works contractor within the development site boundary, appropriate measures must be taken to prevent any runoff into the River Burren during construction works.

Construction Schedule

The approximate construction period for the proposed development is estimated to be four months. Upon approval of the CEMP by development authority, the construction schedule would be finalised at a detailed design stage. The proposed development would include the following main construction activities:

General

- Mobilisation of personnel and equipment to site;
- Site inductions and relevant training;
- Erection of health and safety / construction works signage;
- Site clearance, including any vegetation removal.

Remediation Works at Proposed Site and Associated Works

- Excavations and earth moving activity;
- Stockpiling of material for use in site reinstatement activities;
- There should be no storage of materials or construction works of any kind to take place within the construction exclusion zone of the River Burren;
- Installation of silt control features where appropriate, such as silt fencing;
- Cover of drainage network with silt mats;
- Pouring of concrete;
- Works to facilitate access to the site.

Reinstatement

- Finishing of proposed development site;
- Removal from site of any excess materials remaining following reinstatement works;
- Removal of any silt control features once stabilisation has taken place / temporary storage of excavated materials has been removed.

Main Stages of Construction

Site Clearance and Excavations

During site clearance works, any excess material at the site will be either stored for re-use in construction activities at the development site or removed to a licenced waste facility. During excavation works, subsoil and topsoil would be temporarily stored for re-use in reinstatement where possible. Any excess materials would be transported offsite by a licenced contractor for disposal at a suitably licenced facility. Alternatively, should excess excavated materials/soils be classified as a by-product under Article 27 of the Waste Directive Regulations, 2011, and if the proposed end use meets the requirements of the Article 27 regulations, excavated soils could be directed for local use. The storage of excavated material on site would be temporary, until the completion of site reinstatement activities.

Provision / Upgrade of Services

Following site clearance and excavations, works would commence on the installation of underground utilities to the site required for electricity and telecommunications.

Construction of Development

Following site clearance, excavations and works for the provision of services, works would commence on the construction of the development. The pouring of concrete and laying of macadam would be supervised at all times.

Site Reinstatement and Landscaping

Landscaping works will take place at the proposed site would include the removal of any hardcore surfaces, removal of any stockpiled material from excavations, the removal of construction plant, equipment and signage, the reseeding/replanting of exposed soil where required and the planting of native trees and shrubs. Reinstatement and landscaping activities would also include the removal of silt control features, once there is no risk to the River Burren.

Construction Working Hours

It is anticipated that construction works would be undertaken during standard construction hours, as follows:

Start	Finish	Days
7am	7pm	Monday – Friday

No works would take place at weekends or bank holidays. It should be noted that there may be times where it is necessary to undertake construction works outside of the times mentioned above, for example concrete pours. In such cases, notification would be given where necessary to the relevant bodies (i.e. local authority) and any potentially effected local residents in good time and prior to specified works commencing.

Construction Plant and Equipment

The construction plant and equipment likely to be used during the construction phase of the project are included in the table below. It should be noted that this list is not exhaustive.

Activity	Possible Plant / Equipment Required
Site Clearance and Excavations	Excavator Dumper trucks Bulldozer Graders Rollers
Construction of Activity Park	Excavator JCB Site Dumper Cement Mixer Paver
Site Reinstatement and Landscaping	Tracked Excavator Site Dumper Bulldozer

Security Arrangements

The construction works contractor would ensure the proposed development site is secured, so as to provide the safety of all potentially affected parties, including staff, contractors, traffic and pedestrians. Only authorised personnel would be allowed onto the development site. The site would be secured by a fence, hoarding or another suitable site barrier system to protect against unauthorised entry. The construction works contractor would implement the appropriate security arrangements, including signing in / out procedures, signage and out-of hours security.

Health and Safety

All activities undertaken at the proposed development site during the construction phase shall be in accordance with the requirements of the Safety, Health and Welfare at Work Act 2005, as amended, and the Safety, Health and Welfare at Work (Construction) Regulations, 2013. As required by the 2013 regulations, a Health and Safety Plan would be prepared by the construction works contractor, which would address health and safety issues from the design stages through to the completion of construction works. This plan would be updated and reviewed as required as the proposed development progresses. Prior to works commencing onsite, all site personnel, including sub-contractors, would receive induction training that would incorporate health and safety requirements and good practice. Site induction would be mandatory for all employees, sub-contractors and visitors to the development site. Specific training would be provided, where necessary.

All construction personnel, contractors and visitors to the site would wear the following appropriate Personnel Protective Equipment as a minimum at all times:

- Safety helmet;
- Hi-visibility clothing (coat or vest);
- Safety boots;
- Eye protection where identified for specific activities.

Regular site safety audits would be undertaken throughout the construction phase to ensure the rules and regulations established for the site are complied with at all times.

Construction Signage and Labelling

Environmental signage and labelling would be used to inform site personnel of environmental requirements and restrictions with regards construction activities, in addition to promoting environmental good practice at the development site. The construction works contractor would erect the appropriate signage and label all relevant areas and receptacles. Examples would include designated storage areas for potentially polluting materials and waste and site environmental rules.

Construction Method Statement

Prior to works commencing, the construction works contractor would prepare and provide to the clients a detailed Construction Method Statement, which would address all construction works required for the proposed development. The construction works contractor would maintain a register of all method statements for the project, in addition to a register of all site personnel trained on the method statements.

Environmental Management

Environmental Management Systems

An Environmental Management System (EMS) would be put in place by the construction contractor. The EMS would take into account any comments or recommendations received by Carlow County Council and, in accordance with the relevant guidelines, would be appropriate to the scale of the operation. The construction works contractor would implement a number of environmental management procedures, including but not limited to the following:

- Awareness and Training;
- Environmental Emergency Response;
- Record Keeping, Auditing and Monitoring;
- Environmental Complaints Procedure;
- Protection of Flora and Fauna;
- Protection of Soil, Groundwater and Surface Water Quality;
- Chemical and Hazardous Material Management; • Noise Management;
- Dust Management;
- Waste Management.

The CEMP would be updated as necessary to ensure that all measures detailed within the environmental management procedures have been addressed within the CEMP.

Roles & Responsibilities

The construction works contractor (CWC) would put an experienced construction management team in place. The Project Manager would have overall responsibility for environmental management at the proposed development site. The indicative roles and responsibilities for the relevant site personnel are detailed below.

Project Manager

The Project Manager's responsibilities are as follows:

- Management of the project;
- Implementing the Construction Environmental Management Plan;
- Monitoring the performance of the CEMP and maintaining records to demonstrate compliance with the CEMP and Construction Method Statement;
- Updating the Construction Environmental Management Plan as required;
- Ensuring no deterioration of the environment occurs as a result of the project;
- Co-ordinating the construction team;
- Implementing the Health and Safety Plan and associated responsibilities;
- Production of construction programmes;
- Maintaining of relevant records and registers;

- Ensuring site personnel receive induction and are provided with the relevant information relating to the protection of the environment during works;
- Dealing with any queries or complaints from the public;
- Maintaining a project diary.

Quality Manager

The Quality Manager would report to the Project Manager. Their responsibilities are as follows:

- Implementing the Construction Environmental Management Plan;
- Management of quality issues relating to the project;
- Co-ordinating the construction teams;
- Ensuring that method statements are in place;
- Implementing the Health and Safety Plan.

Site Engineer

The Site Engineer would report to the Project Manager. Their responsibilities are as follows:

- Ensuring that all aspects of the project comply with the Construction Environmental Management Plan;
- Materials procurement;
- Design of Temporary Works;
- Administration;
- Programming and planning;
- Implementing the Health and Safety Plan;
- Maintaining a project diary.

All Staff and Sub-contractors

All site personnel and sub-contractors have the following responsibilities:

- Ensuring the requirements of the Construction Environmental Management Plan are followed;
- Co-operate with the Project Manager and EHS Officer in the implementation and development of the CEMP;
- Co-operate as required with site inspections and audits;
- Report all incidents, accidents and near misses to the Project Manager and/or EHS Officer.

Regulations & Requirements

Legislative Context

The following list of acts and regulations, which is not exhaustive, would be complied with by the construction works contractor throughout the proposed project:

- The Wildlife Act, 1976 and Wildlife (Amendment) Act, 2000;
- European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No. 477 of 2011) and (Amendment) Regulations, 2015 (S.I. No. 355 of 2015), transposing the Habitats Directive 92/43/EEC (as amended) and Birds Directive 2009/147/EC;
- The Flora (Protection) Order, 2015 (S.I. No. 356 of 2015);
- Planning and Development Regulations, 2001 to 2018;
- The Local Government (Water Pollution) Act, 1977, as amended;
- The Fisheries (Consolidation) Act, 1959, as amended;
- Fisheries (Amendment) Act, 1999;
- European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. No. 293 of 1988);
- European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (S.I. No. 272 of 2009);
- Water Framework Directive (2000/60/EC);
- European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010) and 2016 (S.I. No. 366 of 2016);
- Air Pollution Act, 1987;
- Air Quality Standards Regulations, 2011 (S.I. No. 180 of 2011), transposing the Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC);
- Planning and Development Act 2000 (S.I. No. 30 of 2000), as amended;
- The EPA Act (Noise) Regulations 1994 (S.I. No. 179 of 1994);
- European Communities (Construction Plant and Equipment) Permissible Noise Levels Regulations, 1988 (S.I. No. 320 of 1988), as amended;
- European Communities (Noise Emission by Equipment for Use Outdoors) Regulations, 2001 (S.I. No. 632 of 2001);
- Council Directive 1999/31/EC on the Landfilling of Waste and Council Directive 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills;
- Waste Framework Directive 2008/98/EC;
- WEEE Directive 2012/19/EU;
- Waste Management Act 1996 as amended;
- Waste Management (Hazardous Waste) Regulations 1998 (S.I. 163 of 1998) and (Amendment) Regulations 2000 (S.I. 73 of 2000);
- Waste Management (Food Waste) Regulations 2009 (S.I. 508 of 2009);
- European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (WEEE) (S.I. 149 of 2014);
- Litter Pollution Act 1997 and Litter Pollution Regulations 1999 (S.I. 359 of 1999);
- Waste Management (Prohibition of Waste Disposal by Burning) Regulations 2009 (S.I. 286 of 2009), as amended;
- European Communities (Waste Directive) Regulations 2011 (S.I. 126 of 2011), (Amendment) Regulations 2016 (S.I. 315 of 2016), and European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. 223 of 2015), European Union (Waste Directive) (Recovery Operations) Regulations 2016 (S.I. 372 of 2016).

Relevant Guidelines

The following list guidance documents, which is not exhaustive, would be consulted as relevant by the construction works contractor throughout the proposed project:

- Environmental Good Practice on Site (CIRIA, 2015);
- Control of Water Pollution from Construction Sites; guidance for consultants and contractors (CIRIA, 2001);
- Control of Water Pollution from Construction Sites – Guide to Good Practice (CIRIA, 2002);
- Guidelines on Protection of Fisheries During Construction Works in and adjacent to Waters (IFI, 2016);
- The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (National Roads Authority (NRA), 2010);
- Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes (NRA, 2006a);
- Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (NRA, 2006b);
- Guidelines for the Treatment of Bats during the Construction of National Road Schemes (NRA, 2006c);
- Bat Mitigation Guidelines for Ireland (Kelleher and Marnell, 2006);
- Bats & Lighting: Guidance Notes for Planners, Engineers, Architects and Developers (Bat Conservation Ireland, 2010);
- Assessment of dust from demolition and construction 2014 (Institute of Air Quality Management, 2014);
- Guidelines for the Treatment of Noise and Vibration in National Road Schemes (NRA, 2004);
- Code of practice for noise and vibration control on construction and open sites (British Standard 5228-1, 2009);
- Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (DoEHLG, 2006);
- Southern Region Waste Management Plan 2015-2021 and Associated Reports.

Environmental Awareness & Training

Prior to works commencing onsite, this CEMP and its contents would be communicated to all site personnel, including sub-contractors, as part of induction training. Site induction would be mandatory for all employees, sub-contractors and visitors to the development site.

Specific training would be provided, where necessary, to nominated personnel to address any incidents or emergencies that could have a potential to cause environmental pollution. This training would be provided to staff via toolbox talks, and may address issues such as the following:

- Water Pollution;
- Spill Control;
- Noise Pollution;
- Dust Pollution;
- Waste Management

Document Review & Update

To ensure the CEMP remains "fit for purpose", it would be reviewed and updated as necessary throughout the construction phase to ensure that it continues to facilitate efficient and effective delivery of the project environmental commitments for the protection of the environment.

The CEMP would be reviewed to address, for example, the following;

- Any recommendations, comments or observations received by Carlow County Council following the submission of the CEMP for approval;
- Any requirements or issues highlighted by prescribed bodies such as Inland Fisheries Ireland and the NPWS;
- To ensure it reflects best practice at the time of construction;
- To ensure it incorporates findings from previous inspections and audits undertaken by the construction works contractor;
- To ensure it incorporates findings and/or recommendations arising from the site meetings between the construction works contractor and clients.

The Project Manager would be responsible for the review of the CEMP and would ensure that any revisions to the CEMP are effectively communicated as appropriate to onsite personnel and sub-contractors.

Environmental Commitments

The clients recognise that construction works have the potential to adversely impact upon the environment and would therefore ensure that the construction works contractor is committed to the effective implementation of the CEMP. Compliance with the CEMP, including all procedures, work practices and controls, would be mandatory by all personnel and subcontractors employed during the construction phase. The CEMP outlines the necessary control measures that are required to avoid, minimise or mitigate potential effects on the environment.

The construction works contractor would be committed to the implementation of the controls / mitigation measures specified within the following sections:

- Dust Management – Section 5.1;
- Surface Water, Groundwater and Soil Contamination Control – Section 5.2;
- Terrestrial Biodiversity Protection Protocol – Section 5.3;
- Invasive Species Control – Section 5.4;
- Noise and Vibration Control – Section 5.5;
- Traffic Control – Section 5.6;
- Waste Management Control – Section 5.7;
- Chemicals and Hazardous Materials Management – Section 5.8

The Project Manager and Quality Manager would be responsible for the implementation of the CEMP throughout construction works. The Project Manager would be responsible for monitoring the performance of the CEMP and maintaining records to demonstrate compliance with the CEMP and would be assisted by the Quality Manager.

Coordination with External Entities

In the event of an environmental incident at the site, the construction works contractor would follow the Emergency Management Plan as appropriate. The construction works contractor would liaise with the relevant third parties as appropriate, which may include the following:

- Emergency Services;
- Carlow County Council;
- National Parks and Wildlife Service;
- Inland Fisheries Ireland;
- Environmental Protection Agency

Environmental Impacts

Air Quality Impacts

Generally, the primary potential air quality impact or nuisance associated with construction activities is dust. Excavations and earth moving operations may generate quantities of construction dust, particularly in drier weather conditions. The extent of any construction dust generation depends on the nature of the construction dust (soils, sands, gravels, silts etc.) and the construction activity. The potential for construction dust dispersion depends on the local meteorological conditions such as rainfall, wind speed and wind direction.

Particulate Matter (PM10 and PM2.5) is measured at Carlow Town Air Monitoring Site approximately 412m north east of the proposed development and has a Current Index: 2 (Good). The proposed development is located in the Air Zone C (Other Cities and Large Towns) and has a current Air Quality Index status of "2-Good".

The issue of construction dust dispersion may be exaggerated with vehicles transporting sand/gravels/concrete/etc. to and from the site, having the potential to cause an environmental nuisance to use of the local road.

Dust is normally defined as particulate matter in the size range of 1 - 75µm in diameter, with particles less than 1µm being classified as smoke or fumes. Particles greater than 10µm are associated with public perception and nuisance. Dusts are normally present in the atmosphere at varying levels of concentration and can have a wide variety of man-made and natural origins including:

- Products of combustion from e.g. fires, power stations and motor vehicles;
- Mechanical handling of minerals and allied materials;
- Industrial activities.

Dust particles are dispersed by their suspension and entrainment in airflow. Dispersal is affected by the particle size, shape and density, as well as wind speed and other climatic effects. Smaller dust particles remain airborne for longer, dispersing widely and depositing more slowly over a wider area.

The main potential sources of air borne dust from construction activities are as follows:

- Construction vehicles, construction traffic and haulage routes;
- Excavation works and earth-moving activities;
- Materials (particularly excavated soils) handling, storage and stockpiling.

Construction dust control is a common part of construction management practices. The effect of construction activities on air quality, in particular construction dust, would not be significant following the implementation of standard working practices and the proposed mitigation measures outlined in ***Dust Management*** section below.

Surface Water, Groundwater & Soil Impacts

During construction works, the main potential impacts upon surface water quality, groundwater quality and soils would be the release of suspended solids during soil disturbance works and the release of potentially polluting substances, such as hydrocarbons (fuels and oils) and uncured concrete.

Suspended solids could become entrained in surface water run-off and could affect aquatic habitats through deposition. An increase in sediments has the potential to impact upon fish by damaging gravel beds required for spawning, smothering fish eggs and in extreme cases, by interfering with the gills of fish. An increase in suspended solids has the potential to reduce water clarity, which can impact the light penetration of water and may also affect certain behaviours of aquatic fauna such as foraging success.

Another potential source of contamination to surface water quality during construction works would be the potential release of uncured concrete. In the event of uncured concrete entering surface water, the pH would be altered locally, potentially causing an adverse impact upon aquatic flora and fauna and causing an alteration to the waterbody substrate.

As the site is close to the banks of the River Burren the potential for construction works to impact upon surface water quality would be greatly reduced if guidelines and regulations where strictly adhered to.

A potential source of chemical contamination would be from the release of hydrocarbons from construction plant and equipment. Hydrocarbons can affect water quality, potentially resulting in toxic and / or de-oxygenating conditions for aquatic flora and fauna. Pollution could occur in a number of ways, such as neglected spillages, the storage handling and transfer of oil and chemicals and refuelling of vehicles.

With regards the stripping of soils and subsoils at the development site, excavated subsoils and soils would be reused in the reinstatement process where possible. Therefore, there would be no significant impact upon soils due to excavation activities. Specialist machinery would be used during construction works to minimise the potential compaction of soils and subsoils.

The River Barrow and River Nore Special Area of Conservation (SAC) is situated c. 600m downstream of Hanover Park. Control measures would be put in place to ensure that no deterioration in the River Burren arises as a result of the construction of the proposed development and that no adverse effects on the downstream SAC or its qualifying interests will occur.

Terrestrial Biodiversity Impacts

Construction activities have the potential to impact upon terrestrial biodiversity through destruction and loss of habitat, disturbance due to noise and dust, the potential introduction of invasive species and light pollution.

The construction phase of the development would not result in a direct and permanent loss of ecologically valuable habitats or rare or protected plant species. Most of the habitats found within the site are artificial or highly modified and are not of conservation status or of high ecological value.

Dust emissions may arise during construction activities, in particular during earth-moving works, which may have the potential to impact upon photosynthesis, respiration and transpiration processes of flora due to the blocking of leaf stomata and have the potential to cause nuisance to fauna. Given the transient nature of construction works, and the scale of the development, the potential impact to flora and fauna would not be considered significant.

Construction work has the potential to disturb fauna due to the generation of construction noise. However, construction noise would not be considered to pose a significant risk to fauna owing to the small scale of the proposed development, the transient nature of works and given that all vehicles

where possible would be equipped with mufflers to suppress noise, as is standard practice. No construction works would be conducted outside of normal working hours, therefore there would be no disturbance to nocturnal species.

The potential impacts of construction works upon aquatic flora and fauna due to a potential deterioration in water quality are discussed in the ***Surface Water, Groundwater & Soil Impacts*** section above.

Noise Impacts

Construction noise, while inherently noisy and disruptive, is temporary in duration. It is anticipated that the construction of the proposed development would take approximately four months to complete. The works involving heavy machinery for the purposes of excavation, the preparation of building paved areas and passing construction traffic usually cause the most disturbances to nearby residents.

Generally, the type of works involved at this development site would include the following:

- Excavation/Levelling: Excavator, dump truck & dozer.
- Paving: Excavations, in-situ kerbing, paving.
- General Construction: Services, drainage and surfacing etc.

There are currently no published Irish guidance documents relating to permissible noise levels that may be generated during the construction phase of a project. However, the National Road Authority (NRA) has published the document "Guidelines for the Treatment of Noise and Vibration in National Road Schemes", 2004. This document provides a useful reference for assessing construction noise of the proposed development. The NRA considers that the noise levels provided in the table below are typically deemed acceptable.

Days / Times	LAeq (1hr) dB	LpA (max)slow dB
Monday to Friday (07:00 to 19:00hrs)	70	80
Monday to Friday (07:00 to 22:00hrs)	60	65
Saturday (08:00 to 16:30hrs)	65	75
Sundays and Bank Holidays (08:00 to 16:30hrs)	60	65

NRA Acceptable Noise Levels

Traffic Impacts

Accessed to the site is from R448 (Hanover Road) which connects to Maryborough Street. The R448 connects with the M9 motorway approximately 7.5km to the south.

Construction works have the potential to impact upon traffic volumes in the area, which may subsequently impact upon the generation of noise and dust emissions.

Traffic impacts may arise via the following:

- Delivery of construction plant and equipment to the site;
- Delivery of raw materials to the site;
- Vehicle movements from staff, sub-contractors and site visitors travelling to and from the site;
- Vehicle movements associated with waste removal at the site.

Waste Management Impacts

It is anticipated that the following categories of waste may be generated during the construction of the project:

Waste Type	EWC Code	Origin
Concrete	17 01 01	Waste concrete may arise due to surplus concrete from pouring activities.
Wood	17 02 01	Wood waste may arise during construction works, including building and shuttering works, due to damaged / defected wood, off-cuts and surplus wood
Glass	17 02 02	Glass waste may arise due to damaged / defected glass and accidental breakages.
Plastic	17 02 03	Plastic waste may arise due to damaged / defected products
Metals (including alloys)	17 04 01 - 07	Waste metal may arise due to damaged / defected metal, offcuts and surplus metal.
Soils and Stones	17 05 04	Excavated soils and stones waste would arise during site excavations and earth-moving activities.
Biodegradable waste	20 02 01	Green waste would arise during site clearance works, with the removal of existing vegetation at the site.

Categories of Waste Generated During Construction

Other waste materials which may arise during construction works in small volumes include:

- Waste Oils and Liquid Fuels – EWC 13 02 and EWC 13 07;
- Waste from Electrical and Electronic Equipment – EWC 16 02;
- Cables – EWC 17 04 11;
- Paints – EWC 20 01 28;
- Wood Preservatives – EWC 03 02;
- Batteries – EWC 16 06.

Wastes from EWC fractions EWC 03 02, EWC 13 02, EWC 13 07, EWC 16 02 and EWC 16 06 may be hazardous.

Throughout the construction phase, wastes generated would be managed by the construction works contractor in order of priority in accordance with Section 21A of the Waste Management Act 1996, as amended, as per the waste hierarchy below.

The Waste Hierarchy

Environmental Mitigation Measures

Dust Management

The following dust control measures would be implemented by the construction works contractor for the duration of the construction of the proposed development:

- Cognisance would be taken of the guidelines published by the Institute of Air Quality Management (IAQM), "Assessment of dust from demolition and construction 2014";
- Material handling systems and site stockpiling of materials would be designed and laid out to minimise exposure to wind;
- Prolonged storage of materials onsite would be avoided;
- When transporting materials to and from the site, vehicles would be fitted with covers where possible to prevent material loss;
- Public roads outside the site would be regularly inspected for cleanliness and cleaned as necessary. A road sweeper would be used if required;
- While the natural recolonization of exposed areas of soil during reinstatement activities is preferred, re-seeding would be undertaken where required to promote the rapid stabilisation of soils;
- Regular visual inspections would be undertaken around the proposed site boundary to monitor the effectiveness of dust control measures.

Should additional dust control measures be required, for instance during particularly dry weather, dust suppression measures would be undertaken, including the following:

- Water misting plant, such as bowsers and sprays would be used as required and where necessary.

Surface Water, Groundwater & Soil Contamination

The implementation of control measures for dust and materials storage and handling would reduce the potential for a deterioration in water quality. These measures are outlined in the section above and the ***Chemical & Hazardous Materials Management*** section below. The following control measures shall be implemented by the construction works contractor for the protection of surface water quality and groundwater quality:

- The construction works contractor would adhere to standard construction best practice, taking cognisance of the Construction Industry Research and Information Association (CIRIA) guidelines "Control of Water Pollution from Construction Sites; guidance for consultants and contractors" 2001 and "Control of Water Pollution from Construction Sites – Guide to Good Practice", 2002;
- Cognisance would be taken of the 2016 guidelines published by Inland Fisheries Ireland, "Guidelines on Protection of Fisheries During Construction Works in and adjacent to Waters";
- Where spoil is generated, this would only be stored temporarily. A designated spoil area would be established by the construction works contractor within site footprint at the site. This designated area will be situated a minimum of 10m from the River Burren. Where possible, spoil would be covered or alternatively, graded to avoid ponding or water saturation;
- Silt fencing (comprising of a porous filter fabric which detains sediment, or other similar methods) would be provided along the site boundary minimum distance of 10m from the bank

of the River Burren. Silt fencing would remain in place until the completion of construction works;

- Silt control features would be inspected on a daily basis and maintained as appropriate;
- Should water be encountered during excavation works, water would be pumped to a constructed silt control feature, such as a settlement pond. A filter would be provided at the pump inlet and, where required, dewatering bags or silt fences would be used at the outlet to retain any potential silt entrained in the water. Pumping operations would be supervised at all times;
- Works at the flood defence wall should only be carried out when there is no risk of flood waters;
- Excavations and earth-moving activities would be planned outside periods of heavy rainfall, to limit the potential for suspended solids to become entrained within surface water run-off;
- All construction plant machinery and equipment would be maintained in good working order and regularly inspected;
- A designated area for the storage of hydrocarbons would be established by the construction works contractor and inspected on a regular basis;
- Spill kits, adequately stocked with spill clean-up materials such as booms and absorbent pads, would be readily available onsite;
- The construction works contractor would ensure the relevant site personnel are trained in spillage control;
- In the unlikely event of a suspected deterioration in water quality within the River Burren, due to construction works at the development site, works would immediately cease, an investigation into the cause undertaken and the relevant NPWS and Inland Fisheries Ireland personnel informed.

Additional controls to reduce the potential impact upon soils include the following:

- Excavated materials would be stockpiled onsite, segregated into topsoil and subsoils, and reused in reinstatement activities where possible;
- Any fill and aggregate material required onsite would be sourced from reputable, local quarries.

Biodiversity Protection Protocol

It is considered that the implementation of the controls and measures outlined in the ***Environmental Mitigation Measures*** sections would reduce any potential adverse impacts upon the biodiversity in the area. The following control measures are also recommended to ensure that the proposed construction works would not have any significant impact upon biodiversity:

All construction works would be confined as far as possible to the development footprint;

No construction works would be conducted outside of normal working hours, to reduce potential noise disturbance to nocturnal species;

Should a protected fauna species such as Bat species or Otter (Lutra lutra) be found during the construction works, an officer of the NPWS would be notified prior to the resumption of construction works;

Where possible, any vegetation removal works would be scheduled outside of the 1st of March to the 31st of August period, so as not to disturb nesting bird species.

Noise & Vibration Control

The following noise control measures would be implemented by the construction works contractor for the duration of the construction of the proposed development:

- Cognisance would be taken of the National Roads Authority's "Guidelines for the Treatment of Noise and Vibration in National Road Schemes", the British Standard 5228: Part 1 "Code of practice for Noise Control on Construction and Open Sites" and the CIRIA 2015 "Environmental Good Practice on Site";
- Plant and machinery used on-site would comply with the EC (Construction Plant and Equipment) Permissible Noise Levels Regulations, 1988 (S.I. No. 320 of 1988). All noise producing equipment would comply with S.I. No 632 of 2001 European Communities (Noise Emission by Equipment for Use Outdoors) Regulations 2001;
- All construction activities would take place between 7:00am and 7:00pm, Monday to Friday. Any works which, by necessity, are required to be carried out outside of these times would be notified to the relevant bodies and any potentially effected local residents in good time and prior to specified works commencing;
- No plant used on site would be permitted to cause an ongoing public nuisance due to noise;
- A temporary noise barrier should be erected on the sites northern boundary, at a distance of 20m (accounting for the 15m width of the River Burren and a 5m setback distance) from NSR4 and NSR5, during the construction period in order to comply with the NRA guidance limit of 70 dB(A).
- Deliveries would be organised to arrive during daytime hours (between 8:00am and 6:00pm, Monday to Friday;
- Care would be taken when unloading vehicles to minimise noise disturbance. Materials should be lowered, not dropped, insofar as practicable and safe;
- Regular maintenance would be carried out on all construction equipment, machinery and vehicles;
- Construction plant would be operated in accordance with the operator's instructions;
- Engine and machinery covers would be maintained in good working order and would remain closed whenever machinery is in use;
- Where practicable, all mechanical plant would be fitted with effective exhaust silences and pneumatic tools fitted with mufflers or silencers;
- Any compressors required would be silenced or of sound reduced models fitted with acoustic enclosures;
- Construction plant would be selected, where possible, with low inherent potential for the generation of noise;
- Construction plant would be switched off or throttled back to a minimum when not in use;
- Staff personnel would be instructed to avoid unnecessary revving of machinery;
- Site personnel would notify the Project Manager in the event equipment or plant becomes defective, resulting in high noise emissions. Any defective plant would be kept out of service until the necessary repairs are undertaken.

Traffic Control

The construction works contractor would undertake site entrance works to facilitate the access of traffic associated with the proposed development. The construction works contractor would ensure the following:

- Deliveries to the site would be via suitably contained vehicles, with sheeting and covers where required;
- Deliveries to the site would be scheduled during the construction hours of 8:00am to 6:00pm Monday to Friday.
- Deliveries and removals would be coordinated and scheduled to the site to avoid congestion on Hanover Road;
- The contractor shall provide for the safe passage of pedestrian and vehicular traffic and measures to keep the impact of the works on local roads, and local communities to a minimum;
- Local roads would be inspected and cleaned as necessary to ensure that access roads are kept clear of mud and debris;
- Advise haulage contractors on the appropriate routes to and from the site and to adhere to good traffic management principles;
- Materials would not be delivered to the site until required.

Waste Management Control

Waste Storage Area

A designated waste storage area located away from the River Burren, would be established by the construction works contractor. Suitable waste receptacles / skips would be provided by the appointed waste contractor(s) during the construction phase, with skips / bins allocated to specific waste streams to avoid contamination. The number and size of waste receptacles / skips would be determined following the appointment of the waste contractor(s). Waste receptacles would be appropriately labelled.

Where waste fuels and oils are generated, they would be stored within a bunded container within the designated waste storage area. Any hazardous materials would be stored separately from non-hazardous waste and would be stored within bunded containers / upon a bund where appropriate.

The removal of waste from the site would be undertaken on a regular basis, preventing large volumes of waste accumulating onsite.

Waste Contractors

The collection of wastes from the site would be undertaken by suitably authorised waste hauliers and would only be recycled / recovered or disposed of at suitably licenced waste facilities.

The construction works contractor would appoint a waste contractor(s) for the construction phase. The waste contractor(s) appointed for the project would have experience in construction waste management and would be appropriately licenced, holding the relevant waste collection permit and/or waste licences for the types of waste anticipated to be generated during construction works.

The waste contractor(s) would be appropriately licenced in compliance with the following regulations:

- Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007);
- Waste Management (Collection Permit) Amendment Regulations 2008 (S.I. No. 87 of 2008);
- Waste Management (Facility Permit and Registration) Regulations 2007 (S.I. No. 821 of 2007);
- Waste Management (Facility Permit and Regulations) Amendment Regulations 2008 (S.I. No. 86 of 2008).

The construction works contractor would ensure that copies of all waste contractors' collection permits and licences would be available for inspection, as discussed in the "Record Keeping" section below.

Waste Minimisation

Waste minimisation and prevention would be the responsibilities of the construction works contractor, who would ensure the following:

- The efficient ordering and purchasing of materials to reduce surplus materials;
- Materials would be ordered in appropriate sequence to minimise materials stored on site;
- The correct storage of materials to minimise the generation of damaged materials, for example keeping materials packaged until they are ready to be used and storing materials which are vulnerable to water damage via precipitation under cover and raised above the ground;
- The handling of materials with care, to avoid undue damage;
- The return of uncured concrete to the batching plant where possible;
- Where possible, excavated subsoil and topsoil would be reused for the reinstatement of the development site.

The construction works contractor would reuse materials onsite where possible. In particular, inert wastes (such as concrete (EWC 17 01 01), bricks (EWC 17 01 02) and soils and stones (EWC 17 05 04)) would be used for infilling activities where suitable (and where required).

Management of Waste Streams

As mentioned in ***Waste Management Impacts*** section above, wastes generated would be managed by the construction works contractor in order of priority in accordance with Section 21A of the Waste Management Act 1996, as amended.

Records

For each waste movement and for each type of waste, the construction works contractor would obtain a signed waste docket from the waste contractor, detailing the weight, type of material, destination of material and whether the material is going for recycling, recovery or disposal. The construction works contractor would retain copies of the waste contractors' relevant waste collection permits and waste licences on file throughout the construction phase.

Chemical & Hazardous Materials Management

Concrete

The following controls would be implemented throughout the construction phase:

- The delivery and pouring of concrete would be supervised at all times;
- The pouring of concrete would be avoided during periods of expected heavy rainfall;
- Concrete would be poured directly into the shuttered formwork from the Ready-Mix Truck, reducing the risk of spillage;
- The wash-out of Ready-Mix Truck drums would not be permitted onsite, in the environs of the site, or at a location which could result in a discharge to surface water;
- Surplus uncured concrete would be returned to the batching plant where possible.

Hydrocarbons

The following controls for the handling and storage of hydrocarbons would be implemented throughout the construction phase:

- All construction plant machinery and equipment would be maintained in good working order and regularly inspected;
- Any fuels, oils or chemicals would be stored in accordance with the EPA guidance on the storage of materials, in a designated bunded area, with adequate bund provision to contain 110% of the largest drum volume or 25% of the total volume of containers;
- A designated area for the storage of hydrocarbons would be established by the construction works contractor and inspected on a regular basis;
- Deliveries of fuels and oils to the site would be supervised;
- Fuels / oils would be handled and stored with care to avoid spillage or leakage;
- Where appropriate, small construction plant equipment would be placed on drip trays;
- Any waste fuel / oils would be collected in bunded containers at the designated waste area and properly disposed of to an authorised waste contractor;
- Spill kits, adequately stocked with spill clean-up materials such as booms and absorbent pads, would be readily available onsite;
- In the unlikely event of a hydrocarbon spillage, contaminated spill clean-up material would be properly disposed of to an authorised waste contractor;
- The construction works contractor would ensure the relevant site personnel are trained in spillage control;
- Where construction plant shows signs of hydrocarbon leakage, site personnel would cease the operation of the item in plant in question and notify the Project Manager. Any defective plant would be kept out of service until the necessary repairs are undertaken.

Excavated Materials

- This section should be read in conjunction with the dust control measures relating to the storage and handling of spoil. The following controls for the handling and storage of excavated materials would be implemented throughout the construction phase:

- Spoil would only be stored at the proposed development site temporarily. A designated spoil area would be established by the construction works contractor away from the River Burren.
- Spoil would be covered or alternatively, graded, to avoid ponding and water saturation, in addition to minimising exposure to wind;
- Where required, silt fencing would be placed around spoil areas until such time as the excavated soil has been used in re-instatement works or removed offsite by a licenced waste contractor;
- Spoil would be used in the reinstatement process where possible;
- Reinstatement would be undertaken as soon as possible after excavation and earthmoving works.

Emergency Management Plan

An Emergency Response Plan would be prepared for the proposed development by the construction works contractor, which would cover all potential risks, including environmental risks, such as fire, explosion, accidents, spillage and leaks. Designated site personnel would be trained as first aiders and fire marshals, with additional site personnel trained in environmental emergencies such as spill response procedures.

Monitoring & Auditing

Reporting & Record Keeping

The Project Manager would ensure that appropriate, detailed records are maintained during the construction phase of the development. Records of all works associated with the proposed development would be completed by the construction works contractor throughout the construction phase. Environmental records would include waste and site inspection records and where relevant, environmental incident and complaints records. Other records may include Safety Data Sheet records and a copy of the Safety File. Where relevant to the associated works, statutory inspection records would be maintained for such activities as excavations and lifting gear.

Where necessary and as requested by the local authority, copies of relevant construction activity records can be made available.

In the event of an environmental incident occurring at the site with the potential to cause environmental pollution, the Project Manager would notify the clients and the relevant third parties, as outlined in the ***Coordination with External Entities*** section above, as soon as practicable. Such environmental incidents may include:

- Fire;
- Water pollution event;
- Hydrocarbon or chemical spill;
- Excessive noise;
- Excessive dust.

Any complaints and/or incidents would be reported to the Project Manager. The Project Manager would be responsible for developing and maintaining a register of complaints and a register of incidents, with details on follow-up actions. The Project Manager would notify the clients as soon as practicable of any environmental complaint or incident.

Environmental Performance Monitoring

Safety Monitoring

The construction works contractor would monitor the development site during working hours, to ensure activities are undertaken in a safe manner.

Environmental Monitoring

The construction works contractor would ensure activities are undertaken in an environmentally sensitive manner. The construction works contractor would undertake regular site inspections and audits, at least weekly, to monitor the environmental performance of the site and address any potential environmental issues such as dust, litter and noise. Site inspections and audits would include the following:

- Assessment of public access roads;
- Assessment of neighbouring properties;
- Chemical and hydrocarbon storage area;

- Waste storage area;
- Spoil area.

would be discussed at the fortnightly meetings between the construction works contractor and clients.

Conclusion

This CEMP has been prepared to demonstrate the commitment of the clients to environmental management at the proposed development site and outlines the work practices and control measures that would be implemented by the construction works contractor throughout the construction period to ensure that potential environmental impacts are effectively managed, reduced or eliminated.

The CEMP is considered a “live” document and would be reviewed and updated as appropriate upon approval by Carlow County Council and as necessary as construction works progress.

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Appendix G – Public Lighting Reports

DATE: 1 April 2022

DESIGNER: Shane Bradley

PROJECT No: P1026

PROJECT NAME: Hanover Park

ENERVEO
Connecting. Sustaining. Renewing.

Using new locations indicated on the Drawing plotted wattages with CLO Active. Mounting heights to 6Mtrs. Luminaire to have warm white light spectrum (<2700 Kelvin) to reduce blue light. Cowling/Shields to be integtrated into lanterns in locations where bat habitat exists.
Zero upward ratio on all lanterns. Dimming profile to be confirmed.

Luminaire:
Lantern A- LED-PLRL_ RS 63w (WW) 2700 Kelvin
Lantern B- LED-PLU2_ RS 41w (WW) 2700 Kelvin
Lantern C- URBA S 24L35 2.66 klm (WW) 2700 Kelvin

Assumptions:
Lighting Class P4 to BS5489.1 in Accordance with ILP Guidance Note 8 Bats

Outdoor Lighting Report

PREPARED BY: Shane Bradley
Lighting Designer
ENERVEO

Layout Report

General Data

Dimensions in Metres Angles in Degrees

Calculation Grids

ID	Grid Name	X	Y	X' Length	Y' Length	X' Spacing	Y' Spacing
1	Walkway	130.45	71.97	160.63	94.36	0.64	0.58
2	Playground	153.49	105.42	26.51	21.89	1.47	1.46
3	Pump Track	185.91	106.31	45.91	28.22	1.84	1.13
4	Court Grid 4	176.90	132.56	17.68	9.65	0.71	0.39
5	Activity Grid 5	151.16	118.21	4.54	21.42	1.14	1.43

Luminaires

Luminaire A Data

Supplier	Thorn
Type	PLU R 18L105 R/S BPSW CL1 D60 L730
Lamp(s)	LED_PLRL_RS_4667 63W
LampFlux(klm)/Colour	4.67 3000/70
File Name	96272439_(STD).LDT
Maintenance Factor	0.76
Imax70,80,90(cd/klm)	345.5, 21.9, 0.0
No. in Project	4

Luminaire B Data

Supplier	Thorn
Type	PLU R LED 18L70 R/S BPSW CL1 D60 L740
Lamp(s)	LED_PLU2_RS_3594 41W
LampFlux(klm)/Colour	3.59 4000/70
File Name	96260690_(STD).LDT
Maintenance Factor	0.76
Imax70,80,90(cd/klm)	345.5, 21.9, 0.0
No. in Project	2

Luminaire C Data

Supplier	Thorn
Type	URBA S 24L35 NR GY BP CL1 8M MTP76 L740
Lamp(s)	LED_URBA_2660 30W
LampFlux(klm)/Colour	2.66 4000/70
File Name	96269824_(STD).LDT
Maintenance Factor	0.76
Imax70,80,90(cd/klm)	546.0, 52.6, 0.0
No. in Project	4

Layout

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Dimmed to	Target X	Target Y	Target Z
1	A	168.29	106.58	6.00	0.00	0.00	0.00	1.00	100%			
2	A	180.62	142.36	6.00	301.00	0.00	0.00	0.50	100%			
4	B	224.51	109.23	6.00	0.00	0.00	0.00	1.00	50%			
5	B	203.11	114.79	6.00	0.00	0.00	0.00	1.00	50%			
6	C	187.76	92.63	6.00	112.00	0.00	0.00	0.50	100%			
7	C	166.11	92.75	6.00	49.00	0.00	0.00	0.40	100%			

Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Dimmed to	Target X	Target Y	Target Z
8	C	212.49	88.85	6.00	104.00	0.00	0.00	0.40	100%			
11	C	234.29	100.03	6.00	285.00	10.00	0.00	0.40	100%			
11	A	156.77	119.25	6.00	116.00	0.00	0.00	0.50	100%			
12	A	165.05	143.27	6.00	211.00	5.00	0.00	0.50	100%			

Horizontal Illuminance (lux)

Walkway

Results

Eav	4.02
Emin	0.01
Emax	0.00
Emin/Emax	0.00
Emin/Eav	0.00

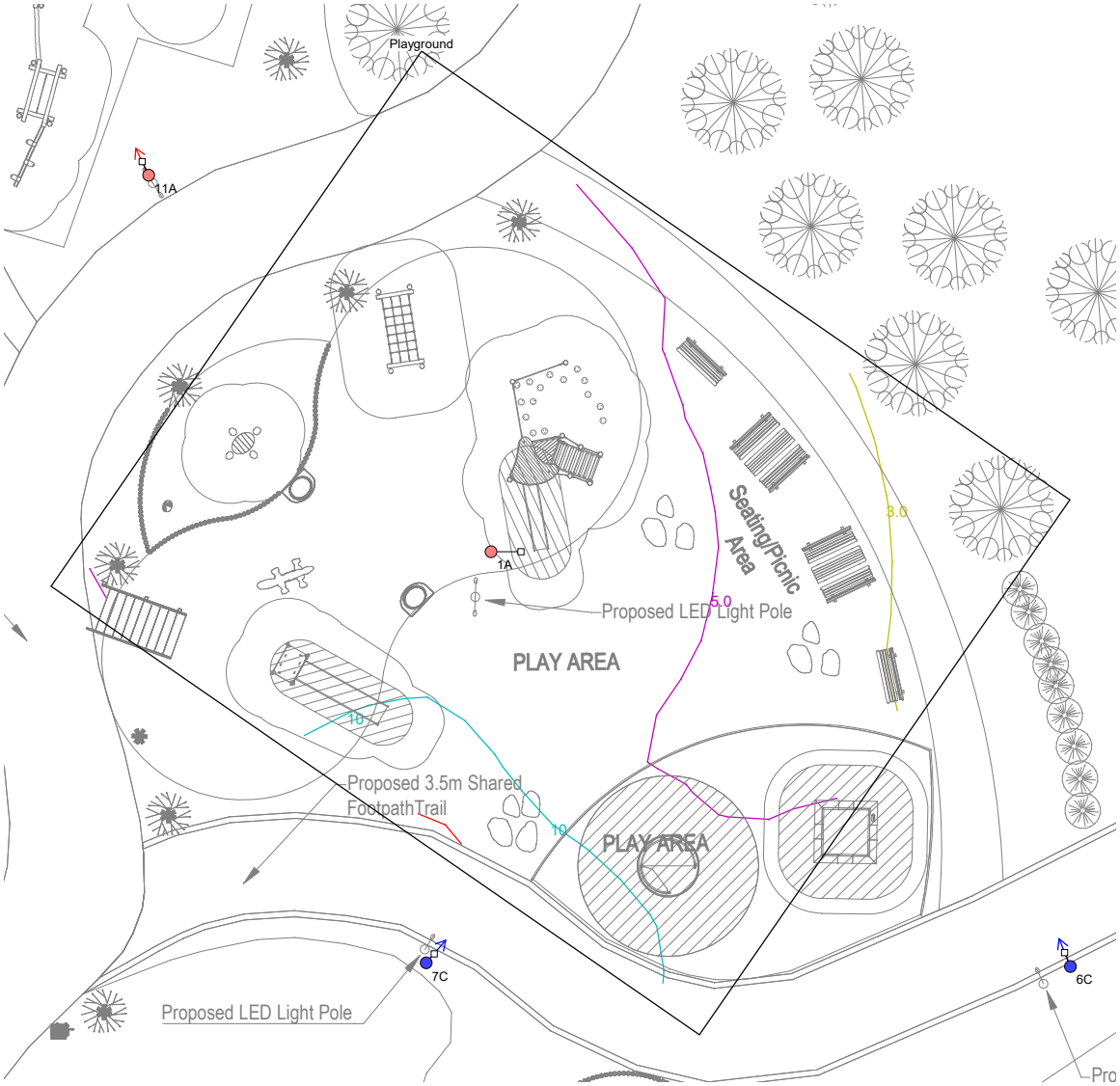
DATE: 1 April 2022 DESIGNER: Shane Bradley

PROJECT No: P1026 PROJECT NAME: Hanover Park

ENERVEO Connecting. Sustaining. Renewing.

Horizontal Illuminance (lux)

Playground



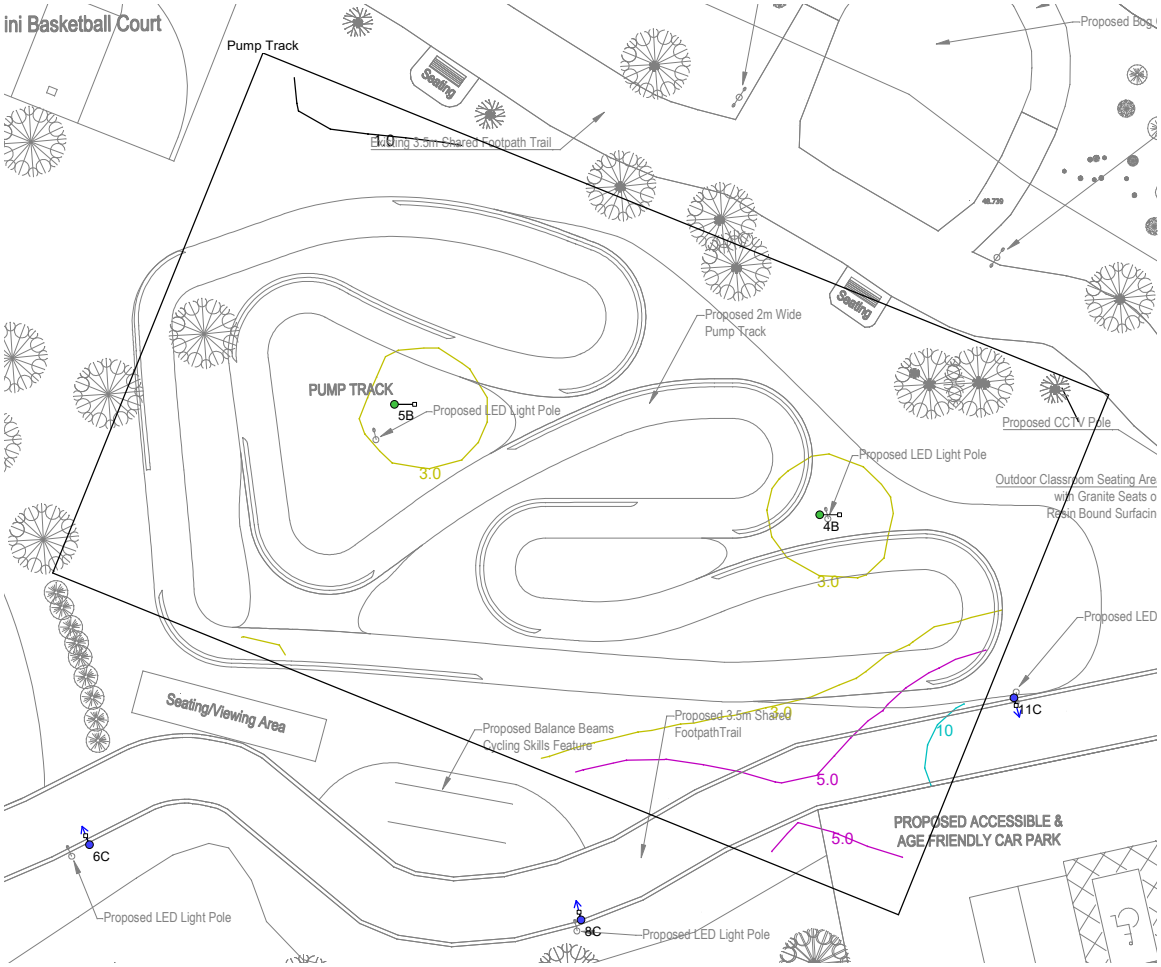
Results

Eav	7.20
Emin	3.08
Emax	15.43
Emin/Emax	0.20
Emin/Eav	0.43

851472137

Horizontal Illuminance (lux)

Pump Track



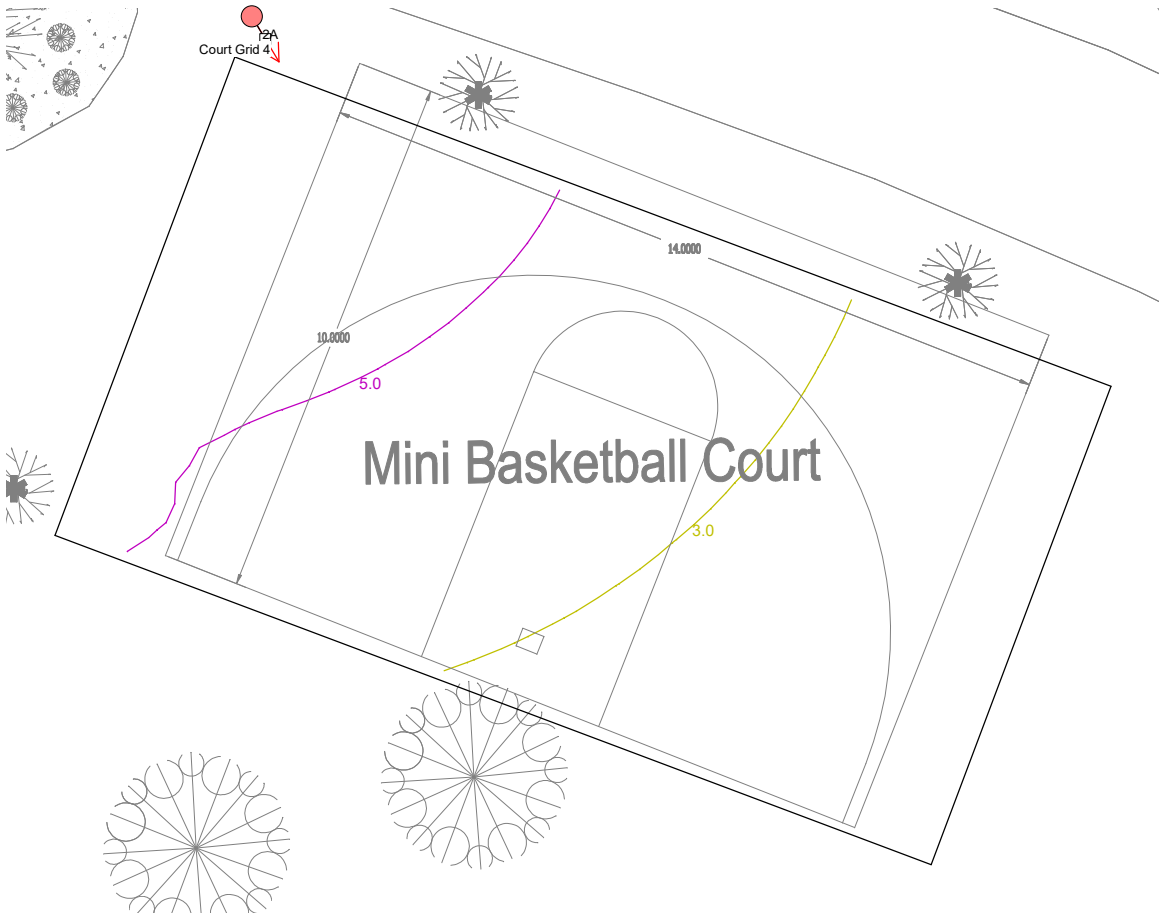
Results

Eav	2.26
Emin	1.23
Emax	8.62
Emin/Emax	0.14
Emin/Eav	0.54

851472137

Horizontal Illuminance (lux)

Court Grid 4



Results

Eav	3.67
Emin	1.38
Emax	8.30
Emin/Emax	0.17
Emin/Eav	0.38

851472137

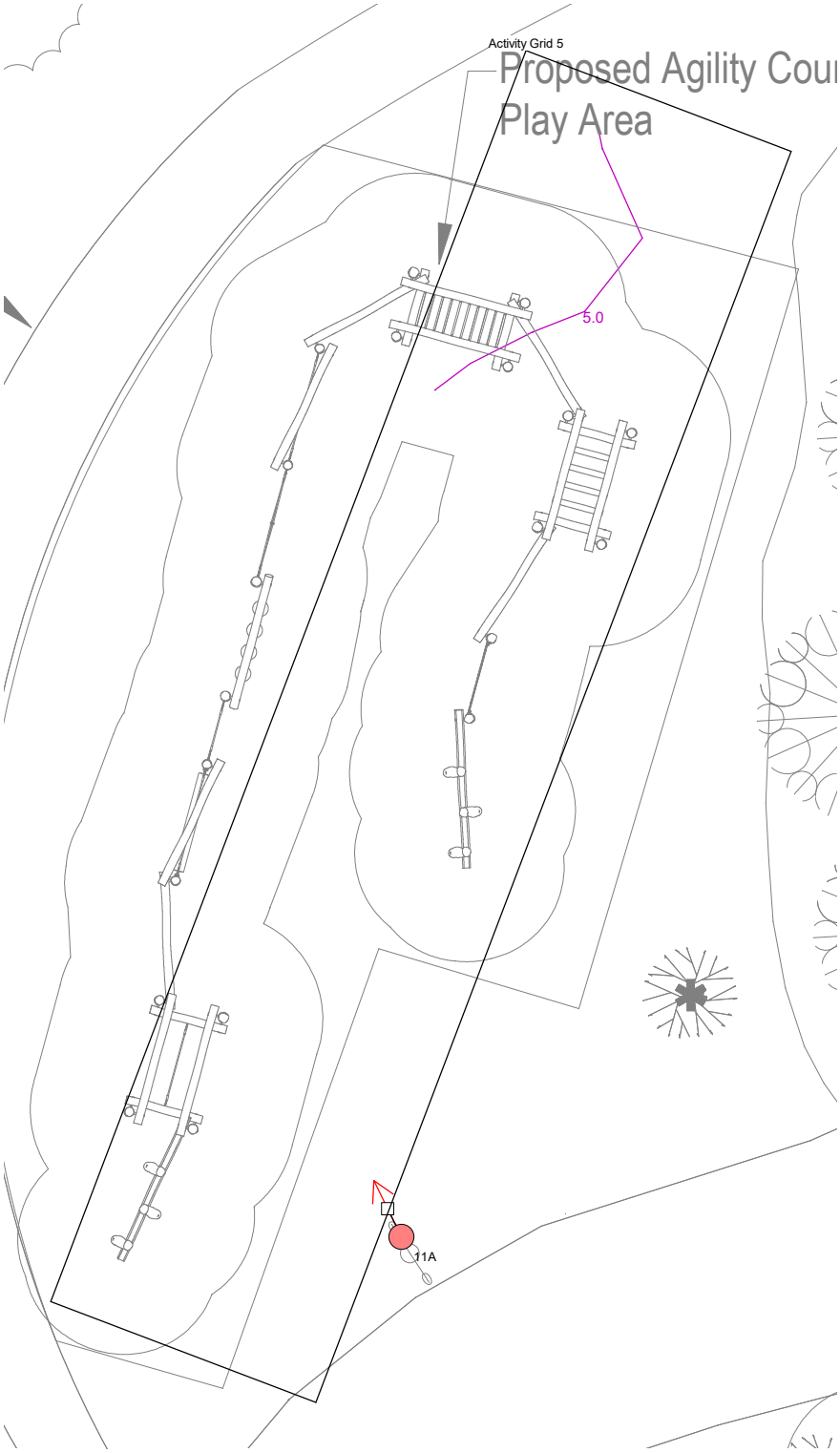
DATE: 1 April 2022 DESIGNER: Shane Bradley

PROJECT No: P1026 PROJECT NAME: Hanover Park

ENERVEO
Connecting. Sustaining. Renewing.

Horizontal Illuminance (lux)

Activity Grid 5



Results

Eav	6.42
Emin	4.49
Emax	9.92

851472137

	Luminaire A	Luminaire B	Luminaire C
Supplier	Thorn	Thorn	Thorn
Type	PLU R 18L105 R/S BPSW CL1 D 60 L730	PLU R LED 18L70 R/S BPSW CL 1 D60 L740	URBA S 24L35 NR GY BP CL1 8 M MTP76 L740
Lamp(s)	LED_PLRL_RS_4667 63W	LED_PLU2_RS_3594 41W	LED_URBA_2660 30W
Lamp Flux (klm)	4.67	3.59	2.66
Maintenance Factor	0.76	0.76	0.76
No. in Project	4	2	4

ENERVEO
Connecting. Sustaining. Renewing.

PROJECT NAME:
Hanover Park

PROJECT No:
P1026

SCALE:
1:500

DATE:
1 April 2022

CALCULATION:
Horizontal Illuminance (lux)

DESIGNER:
Shane Bradley

Using new locations indicated on the Drawing plotted wattages with CLO Active. Mounting heights to 6Mtrs. Luminaire to have warm white light spectrum (<2700 Kelvin) to reduce blue light. Cowling/Shields to be integrated into lanterns in locations where bat habitat exists.
Zero upward ratio on all lanterns. Dimming profile to be confirmed.

Luminaire:
Lantern A- LED-PLRL_ RS 63w (WW) 2700 Kelvin
Lantern B- LED-PLU2_ RS 41w (WW) 2700 Kelvin
Lantern C- URBA S 24L35 2.66 klm (WW) 2700 Kelvin

Assumptions:
Lighting Class P4 to BS5489.1 in Accordance with ILP Guidance Note 8 Bats
Environment Zone E3
Mounting Height @ 6 Mtrs
Cleaing Cycle @ 6 years
MF - 0.76

PREPARED BY:

Shane Bradley
Lighting Designer
ENERVEO

FILE NAME
C:\Users\shane.bradley\OneDrive - Enerveo \Documents\Lighting Reality\projects\Will Connolly\P1026 Hanover Park\Hanover Park Carlow - Final.rtma

Results Walkway	
Eav	4.02
Emin	0.01
Emax	17.32
Emin/Emax	0.00
Emin/Eav	0.00

851472137

PL2217 ENVIRONMENTAL IMPACT OF LIGHTING SCHEME UPON BATS

HANOVER PARK, CARLOW TOWN.

JAMES MOLLOY BENG.

06/04/2022

INTRODUCTION

This report has been prepared by Molloy Consulting Engineers for following a request by Carlow County Council to examine the lighting design and to address its potential impact on bats and other wildlife based on my experience as a Public Lighting Designer, former Authorising Officer for Carlow County and member of the Institute of Lighting Professionals of Ireland.

REPORT

This is to examine, that the Outdoor Lighting Scheme, designed for proposed Hanover Park Development, has taken into account best practice, as published by the UK Bat Conservation Trust, in respect of mitigation strategies, to minimise the impact of outdoor lighting upon bat populations. ILP Guidance Note 8 – Bats and Artificial Lighting has also been consulted.

LED type lanterns, of the Warm White type, have been specified, with a Colour Temperature of 2,700K, as is considered least disruptive to the emergence of bats from roosts at dusk, and subsequent movement from habitats to foraging locations.

LED lanterns do not emit any ultraviolet or infra-red radiation, this again being a desirable feature in relation to impact upon bats in terms of causing spatial exclusion from artificially lit areas.

P4 lighting class, per BS EN 5489-1: 2020 has been selected, which I believe is low as is practicable for an urban park. This has a 5 Lux average value and 1 Lux minimum values. The 1 Lux minimum is equivalent to moonlight and is the bare minimum to prevent trips and falls. Lighting in a park must also provide people with a sense of

security which I think makes nomination of P5 Class (3 Lux average, 0.6 Lux minimum) out of the question.

Hanover Park is located in an urban environment so security of the occupants at night is a serious consideration. With a P4 lighting class and broad colour sprectrum facial recognition of bad actors will be more easily accomplished. Should security cameras be installed at a future date they will be able to operate effectively with the lighting layout proposed.

Lanterns are of the fully cut off type with no light output above the horizontal plane.

The lighting report states that cowling/shields are to be integrated into lanterns in locations where bat habitat exists.

CONCLUSION

The presence of a buffer zone by the river should help to mitigate some of the impacts of this lighting scheme vs the existing instllation. The existing lights are facing away from the river and being LED luminaires should have negligible backspill into the buffer zone.

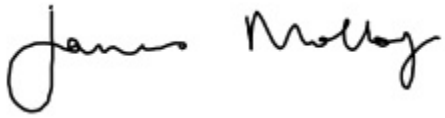
In past schemes I've been advised that where possible it is best to avoid placing lights near mature trees and in this instance that has been accomplished to a large extent, with the majority of the wooded area being to the west of the site away from any lighting column.

RECOMMENDATIONS

Lights 11 and 12 should not be tilted, as shown in the Lighting Reality study, and instead should be mounted in the horizontal to avoid any upward light spill and accompanying sky glow.

In addition to the low illuminance level of the (LED) adjusted P4 Lighting Class selected, dimming of the light levels to Class P5 between 23.00 hrs. and 06.00hrs. should be specified to further reduce the environmental impact of the scheme.

In my estimation Enervio designer Shane Bradley has kept light levels to as low a level as is sensible from a human liability perspective and to adhere to base requirements set out in BS EN 5489: 2020 Design of road lighting. Lighting of roads and public amenity areas - code of practice.



James Molloy BEng

MOLLOY CONSULTING ENGINEERS

0863152764

Appendix H – Letters of Support

Irish Wheelchair Association™

Irish Wheelchair Centre, Kilkenny Road, Carlow R93 K3H4

REGISTERED OFFICE
Áras Chúchulainn
Blackheath Drive
Clontarf, Dublin 3
D03 AW62

T 01 818 6400
F 01 833 3873
E info@iwa.ie

www.iwa.ie

Mr. Ciarán Brennan
Council Engineer,
Carlow County Council
Athy Road,
Carlow
R93 E7R7

5th November 2021

Re. Hanover Park, Carlow

Dear Ciarán,

I behalf of the Irish Wheelchair Association welcome Carlow County Council's consultation, regarding universal access.

Current focus is enhancing Hanover Park as an inclusive public facility in Carlow. Transforming Hanover Park and therein facilities as physically accessible for people with disabilities renders this prime area more inclusive for the general populace. A public park's gateways, pathways, as also recreational amenities, such as picnic areas, seating and playground must be accessible for all citizens. Local council's herein consultation with Irish Wheelchair Association verifies such a prioritised approach.

It is, for example imperative to invest and ensure children with disabilities have equal access with peers to participate in play, recreation and leisure activities at Hanover Park. A public park's playground must be designed on the principles of universal access. Playground is located on a level site with smooth and non-slip surfacing. Play equipment is carefully chosen to allow for social interaction with many play items usable by the broadest range of children. At least one play item within each main play activities of swinging, sliding, rocking and climbing is accessible to children with mobility, cognitive and sensory impairments. Ground level play items including sand and water play must be at a height that is easily accessible to all children. An accessibly designed playground at Handover Park enables everyone to play, regardless of abilities.

Other accessible features include:

- Ramps instead of steps
- Rubber surfaces instead of wood chips or gravel.
- Lowered play items, thereby reachable at a sitting level.
- Elevated sand/water boxes with leg and knee space underneath.
- Roll-on swing sets.
- Sign language games, such as fingerspelling displays
- Clear visibility throughout the playground with no walls like dividers.
- Distinct colours
- Shades of colour chosen to accommodate colour-blindness.
- Braille displays.
- No tripping hazards.
- Fences around the playground to prevent children wandering away and to help avoid dangerous areas.
- Swing sets with seats that incorporate seat belts and lateral supports: great for those with poor balance.
- Inclusive playground equipment that can be used by all children.

Irish Wheelchair Association (IWA) with currently 20,000 plus members provides a wide range of services with and for people experiencing varying abilities. Services include facilitation of holidays for people with disability and simultaneously respite for family carers. A universally designed public park in Carlow will enhance IWA's holiday services locally and nationally. Transforming Hanover Park renders it a valuable resource for IWA Carlow and other localised organisations' representing people with disability.

Don't hesitate to again contact Irish wheelchair Association, thereby people with physical disability in the transformation of Handover Park, as an all-inclusive public amenity.

Yours sincerely

Gerry Morahan
Service Coordinator.

St. Catherine's Community Services Centre

St. Joseph's Road, Carlow Tel: 059 9138700 info@catherines.ie www.catherines.ie

Carlow Municipal District Office
Carlow County Council
Kernanstown
Carlow

8th November 2021

Dear Sir/Madam

St Catherine's Community Services Centre works with individuals, families and children in Carlow Town and its environs. St Catherine's has long identified the need for play facilities in Carlow Town and currently there are very little beside the small playground in Carlow Town Park. In particularly St Catherine's calls for and supports any application for play facilities and equipment that are universally accessible in Carlow Town. Hanover Park in the centre of town would benefit by the addition of universally accessible play equipment to serve the large population of Carlow Town.

If you need any further information, please do not hesitate to contact me.

Yours faithfully

Niall Morris
Director of Services

Ciaran Brennan

From: Martha Jane Duggan
Sent: Monday 8 November 2021 13:02
To: Ciaran Brennan
Subject: Support for the fully accessible park and playground proposal CMD

Dear Ciaran,

Everybody, no matter what their background or circumstances, should have the opportunity to participate in physical activity at a level of their choosing. Carlow County Council Sports Partnership welcomes Carlow Municipal Districts proposal of a fully accessible park with accessible playground to provide the opportunity for the people of Carlow to participate in physical activity at level of their choosing.

Providing access for people who have disability is generally recognised as requiring a Universal Design approach. Universal Design, as defined by the Irish Disability Act 2005, is an inclusive approach to design and construction aimed at making the built environment and its facilities accessible and usable for everyone to enjoy. These improvement works proposed by Carlow Municipal District Office will ensure that the amenity is accessible and usable for everyone.

Public Parks are environments that are designed and laid out for recreation purposes often including amenities such as pathways, playgrounds and seating areas. Carlow Municipal District Office proposal shows how they have considered how accessibility will be built into the design of the park and playground. A dedicated accessible car park will be provided part of the proposal to allow people who may have to travel by car to access the park. The accessible footpaths are to be designed to allow shared-use and capable of facilitating a range of users including walkers, cyclists, buggy users and in many instances people with disabilities. The playground proposal allows for an accessible and inclusive design approach which means it will be easier for everyone to play regardless of their abilities.

Project Carlow 2040 aims for Carlow Town to be a high-functioning inclusive, compact and accessible town underpinned by a robust and diverse local economy. It seeks to provide Carlow Town with plentiful, accessible and exciting public spaces that are attractive to people all day and all year round, providing fundamental element of urban life. The proposed project by Carlow Municipal District captures the ethos of this by providing an accessible park with amenities in the centre of Carlow Town and as a result Carlow County Sports Partnership are excited to support this proposed project as it will be the first accessible park with accessible and inclusive playground for Carlow Town and County.

If you are successful with your funding application Carlow County Council Sports Partnership will be delighted to support and advise you during the project life cycle.

Kind regards,

Martha Jane

Martha Jane Duggan | Coordinator | Carlow Sports Partnership

Dept Housing, Community & Recreation, Aras an Chontae, Athy Road, Carlow | R93E7R7

T: +353 (0)59 9136207
M: +353 (0)872145262
E: mjduggan@carlowcoco.ie

FB: www.facebook.com/County-Carlow-Sports-Partnership-208835509176257/timeline/

Web: www.carlowsports.ie

Ciaran Brennan

From: Andrea Dalton <adalton@carlow.ie>
Sent: Monday 8 November 2021 12:49
To: Ciaran Brennan
Subject: Universally Accessible Play Equipment

Dear Sir/Madam

I write to fully support Carlow County Council's application for funding for the provision for universally accessible play equipment for Hanover Park. There is a severe lack of playgrounds and universally accessible play equipment in the Carlow Municipal District which has a population over over 24,000 and in particular in Carlow Town itself.

Please look favourably on this application as the inclusion of universally accessible equipment would benefit so many in the Carlow Town area, particularly those who are most disadvantaged and don't have the means to travel to other locations in the County or nearby counties.

If you need any further information please do not hesitate to contact me.

Yours faithfully
Andrea Dalton

Councillor Andrea Dalton
Member of Carlow County Council
Barr na Cassa
Tinryland
Carlow
R93 X659
(086) 8512 813

Appendix I – Letters to Prescribed Bodies

CARLOW
COUNTY COUNCIL
COMHAIRLE CHONTAE CHEATHARLACH

County Buildings, Athy Road,
Carlow, R93E7R7
Oifigí an Chontae, Bóthar Átha Í,
Ceatharlach, R93E7R7

Tel: 059 9170300
Fax: 059 9141503
Email: secretar@carlowcoco.ie
Web: www.carlow.ie

A Chara,

RE: - Notice of Application for Approval to An Bord Pleanala, Section 177AE of the Planning & Development Act 2000 (as amended).
- Proposed Redevelopment of Hanover Park to an Activity & Bike Park in Carlow Town.

The following is a list of the prescribed bodies that project information has been sent to in relation to the proposed redevelopment of Hanover Activity & Bike Park in Carlow Town;

Prescribed Body	Address
An Taisce	Planning Department An Taisce, The National Trust for Ireland Tailors' Hall, Back Lane Dublin 8
Department of Housing, Local Government & Heritage	Custom House, Dublin, C01 W6X0
Environment Protection Agency	Johnstown Castle Johnstown, Co Wexford
Fáilte Ireland	88 - 95 Amiens Street Dublin 1 D01 WR86
Heritage Council	Aras na hOidlreachta, Church Lane, Kilkenny. R95 X264
Inland Fisheries Ireland	Anglesea Street Clonmel Co Tipperary
Irish Water	PO Box 860, South City Delivery Office, Cork
Waterways Ireland	2 Sligo Road Enniskillin Co Fermanagh

Mise, le meas

Barry Knowles
Barry Knowles
Senior Executive Engineer
087 3308327

CARLOW
COUNTY COUNCIL
COMHAIRLE CHONTAE CHEATHARLACH

County Buildings, Athy Road,
Carlow, R93E7R7
Oifigí an Chontae, Bóthar Átha Í,
Ceatharlach, R93E7R7

Tel: 059 9170300
Fax: 059 9141503
Email: secretar@carlowcoco.ie
Web: www.carlow.ie

Inland Fisheries Ireland
Anglesea Street
Clonmel
Co Tipperary

RE: - Notice of Application for Approval to An Bord Pleanala, Section 177AE of the Planning & Development Act 2000 (as amended).
- Proposed Redevelopment of Hanover Park to an Activity & Bike Park in Carlow Town.

A Chara

Pursuant to Section 177AE of the Planning & Development Act 2000 (as amended), and the requirements of the Planning & Development Regulations 2001 (as amended), we hereby give notice that an application, including a Natura Impact Statement and relevant plans and particulars, for a proposed development comprising the **proposed redevelopment of Hanover Park in Carlow Town**, has been submitted to An Bord Pleanala.

The Natura Impact Statement, including the plans and particulars for the proposed development, will be placed on public display from ***Wednesday 20th April 2022 to Friday 3rd June 2022,*** both dates inclusive at the following locations:

- **Carlow County Council Offices, Reception Foyer, County Buildings, Athy Road, Carlow.**
- **An Bord Pleanála Offices, 64 Marlborough Street, Dublin 1 (during normal office hours 9.15am to 5.30pm Monday to Friday excluding public holidays)**

Submissions or observations with respect to the proposed development may be made to **An Bord Pleanala** in relation to:

i. the implications of the proposed development for proper planning and sustainable development in the area concerned;
ii. the likely effects on the environment of the proposed development; and,
iii. the likely significant effects of the proposed development on a European Site.

Submissions or observations should be made in writing to **An Bord Pleanala, 64 Marlborough Street, Dublin 1 not later than 5.30 p.m. on Friday 3rd June 2022**

Mise, le meas

Barry Knowles
Senior Executive Engineer
087 3308327

CARLOW
COUNTY COUNCIL
COMHAIRLE CHONTAE CHEATHARLACH

County Buildings, Athy Road,
Carlow, R93E7R7
Oifigí an Chontae, Bóthar Átha í,
Ceatharlach, R93E7R7

Tel: 059 9170300
Fax: 059 9141503
Email: secretar@carlowcoco.ie
Web: www.carlow.ie

Planning Department
An Taisce, The National Trust for Ireland
Tailors' Hall, Back Lane
Dublin 8

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Mise, le meas

Barry Knowles
Senior Executive Engineer
087 3308327

CARLOW
COUNTY COUNCIL
COMHAIRLE CHONTAE CHEATHARLACH

County Buildings, Athy Road,
Carlow, R93E7R7
Oifigí an Chontae, Bóthar Átha Í,
Ceatharlach, R93E7R7

Tel: 059 9170300
Fax: 059 9141503
Email: secretar@carlowcoco.ie
Web: www.carlow.ie

Ms Nicola Lawlor
Senior Executive Officer
Planning Department
Carlow County Council

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Barry Knowles
Senior Executive Engineer
087 3308327

CARLOW
COUNTY COUNCIL
COMHAIRLE CHONTAE CHEATHARLACH

County Buildings, Athy Road,
Carlow, R93E7R7
Oifigí an Chontae, Bóthar Átha Í,
Ceatharlach, R93E7R7

Tel: 059 9170300
Fax: 059 9141503
Email: secretar@carlowcoco.ie
Web: www.carlow.ie

Department of Housing, Local Government & Heritage
Custom House,
Dublin,
C01 W6X0

RE: - Notice of Application for Approval to An Bord Pleanala, Section 177AE of the Planning & Development Act 2000 (as amended).
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Barry Knowles
Senior Executive Engineer
087 3308327

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County Buildings, Athy Road,
Carlow, R93E7R7
Oifigí an Chontae, Bóthar Átha Í,
Ceatharlach, R93E7R7

Tel: 059 9170300
Fax: 059 9141503
Email: secretar@carlowcoco.ie
Web: www.carlow.ie

Environment Protection Agency
Johnstown Castle
Johnstown,
Co Wexford

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The Natura Impact Statement, including the plans and particulars for the proposed development, will be placed on public display from ***Wednesday 20th April 2022 to Friday 3rd June 2022,*** both dates inclusive at the following locations:

- **Carlow County Council Offices, Reception Foyer, County Buildings, Athy Road, Carlow.**
- **An Bord Pleanála Offices, 64 Marlborough Street, Dublin 1 (during normal office hours 9.15am to 5.30pm Monday to Friday excluding public holidays)**

Submissions or observations with respect to the proposed development may be made to **An Bord Pleanala** in relation to:

i. the implications of the proposed development for proper planning and sustainable development in the area concerned;
ii. the likely effects on the environment of the proposed development; and,
iii. the likely significant effects of the proposed development on a European Site.

Submissions or observations should be made in writing to **An Bord Pleanala, 64 Marlborough Street, Dublin 1 not later than 5.30 p.m. on Friday 3rd June 2022.**

Mise, le meas

Barry Knowles
Senior Executive Engineer
087 3308327

CARLOW
COUNTY COUNCIL
COMHAIRLE CHONTAE CHEATHARLACH

County Buildings, Athy Road,
Carlow, R93E7R7
Oifigí an Chontae, Bóthar Átha Í,
Ceatharlach, R93E7R7

Tel: 059 9170300
Fax: 059 9141503
Email: secretar@carlowcoco.ie
Web: www.carlow.ie

Fáilte Ireland
88 - 95 Amiens Street
Dublin 1
D01 WR86

RE: - Notice of Application for Approval to An Bord Pleanala, Section 177AE of the Planning & Development Act 2000 (as amended).
- Proposed Redevelopment of Hanover Park to an Activity & Bike Park in Carlow Town.

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Heritage Council,
Aras na hOidlreachta,
Church Lane,
Kilkenny.
R95 X264

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Irish Water,
PO Box 860,
South City Delivery Office,
Cork

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Waterways Ireland
2 Sligo Road
Enniskillin
Co Fermanagh

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