

St Edmundsbury Hospital

Volume II - Environmental Impact
Assessment Main Report

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The Governors of Saint Patrick's
Hospital

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Contract

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Purpose

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Abbreviations

AA - Appropriate Assessment
CEMP - Construction and Environmental Management Plan
EclA - Ecological Impact Assessment
EIAR - Environmental Impact Assessment Report
LAP - Local Area Plan
NIAH - National Inventory of Architectural Heritage
NMS - National Monuments Service
SFRA - Strategic Flood Risk Assessment
WFD - Water Framework Directive
Zol - Zone of Influence

1 Introduction

This Environmental Impact Assessment Report (EIAR) has been prepared on behalf of The Governors of Saint Patrick's Hospital (SPMHS) in relation to the proposed development and expansion of St Edmundsbury Hospital, Lucan, Co. Dublin.

1.1 Purpose of this Report

The Planning and Development Act 2000, as amended, provides for a special planning application process for what is termed "strategic infrastructure development" (SID). Developments which fall under the definition of SID go directly to An Coimisiún Pleanála (ACP) for planning permission.

Types of development which are included in the Seventh Schedule of the 2000 Act, as amended, are required to go to the Board for a pre-application consultation before making the application, under Section 37E of the 2000 Act as amended. Part 4 of Schedule 7, as substituted by the Environment (Miscellaneous Provisions) Act 2011, is as follows:

"4. Development comprising the following: A health care facility (other than a development which is predominantly for the purposes of providing care services (within the meaning of section 3 of the Nursing Homes Support Scheme Act 2009)) which, whether or not the facility is intended to form part of another health care facility, shall provide in-patient services and shall have not fewer than 100 beds in order to so provide."

The proposed development, being a healthcare facility of over 100 beds, falls within the above category, and requires pre-application consultation with the Coimisiún.

Following consultation, if the Board is of the opinion that the proposed development falls within one or more of paragraphs (a) to (c) of Section 37A(2) of the 2000 Act, the proposed development is then classed as SID, and must be submitted to the Coimisiún for planning permission.

1.1.1 The Planning and Development Act 2000 - Mandatory EIAR

The Planning and Development Act 2000, as amended, Section 37E(1) states that "an application for permission for development in respect of which a notice has been served under Section 37B(4)(a) shall be made to the Coimisiún and shall be accompanied by an environmental impact assessment report".

An environmental impact assessment is therefore required to be prepared and submitted to support the planning application.

1.2 Environmental Impact Assessment

The EIAR will be undertaken in accordance with the requirements of Directive 2014/52/EU on the assessment of the effects of a development on the environment. The EIAR will also be undertaken in accordance with the EPA's Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2022).

1.2.1 EIAR Scoping

Scoping is a vital part of the EIA process, as it allows the EIAR to be as tightly focused as possible. According to the EPA's 2022 Guidance, scoping should be guided by the following criteria:

- 'Likely' and 'Significant' are the principal criteria for determining what should be addressed. Any issues that do not pass this test (i.e., are not both likely and significant effects) should be omitted (scoped out) from further assessment. A section of the EIAR should describe the scoping process explaining why such issues have been scoped out and they are not being considered further. All the prescribed environmental factors need to be listed in the scoping section of the EIAR:
 - Population and Human Health;
 - Biodiversity;
 - Land;
 - Soil;
 - Water;
 - Air;

- Climate;
 - Material Assets;
 - Cultural Heritage;
 - Landscape; and
 - Interactions.
- It is important to note that the environmental factors themselves cannot be scoped out and must feature in the EIAR. Only subtopics and headings related to each factor can be scoped in or out. Each environmental factor should be clearly covered by one or more specific section headings in the EIAR. If scoping determines that no likely significant issues arise under any heading, then an explanatory text should be included.
 - Precedence - where EIARs for similar projects on similar sites or for other project proposals for the same site are available, these can be useful references.
 - Interactions – careful consideration of pathways – direct and indirect – that can magnify effects through the interaction or accumulation of effects – for instance the potential for cumulative significant effects to arise from multiple non-significant effects

1.3 Project Background

The subject site located in Lucan, Co. Dublin comprises an overall site area of c. 8.10 ha. The site comprises the grounds and premises of the Saint Edmundsbury Hospital, and is bounded by greenfield to the North, by farm buildings and a school to the East, by Lucan road to the South, and by the river Liffey with its adjacent land and Pre-school to the West.

The overarching objective of the project is to

"...create a world-class in-patient mental health campus, with a sylvan setting. The landscaping will maximise service users exposure to nature by providing a series of high-quality, secure outdoor spaces. Service users will have access to walking-routes, horticultural therapy and leisure outdoor activities in line with the principles of landscape and mental health, complimentary to the mission of excellence and quality of mental health care provided."

The scheme is intended to provide:

- Adult and Adolescent Inpatient Services;
- Adult and Adolescent Day Services;
- Higher Acuity Services;
- Eating Disorder Services;
- Age Care Services;
- General Psychiatric Care Services;
- Consultants and Hospital Administration; and
- A full range of Therapeutic Services, including music, arts, crafts and horticulture.

An illustrative description of the Project Background is contained in the Architectural Design Statement (TOT Architects, February 2026) which forms part of this planning application.

1.4 Format and Methodology of the EIAR

This EIAR comprises 3 volumes as follows:

- Volume 1, Non-Technical Summary;
- Volume 2, Environmental Impact Assessment Report; and
- Volume 3, Environmental Impact Assessment Report Appendices

This EIAR comprises the presentation of an extensive range of information and analysis from the EIAR Team. The EIAR is split into the following Chapters:

- Chapter 1 - Introduction;
- Chapter 2 - Description of Proposed Development;
- Chapter 3 – Population and Human Health;

- Chapter 4 - Biodiversity;
- Chapter 5 - Land and Soil;
- Chapter 6 – Water – Surface and Groundwater;
- Chapter 7 - Air and Climate;
- Chapter 8 - Noise and Vibration;
- Chapter 9 - Material Assets;
- Chapter 10 - Cultural Heritage;
- Chapter 11 - Landscape and Visual Impact Assessment;
- Chapter 12 - Interactions;
- Chapter 13 - Cumulative Impacts; and
- Chapter 14 - Schedule of Mitigation.

Each competent expert has prepared their relevant chapters which are primarily set out in the following format:

- Introduction;
- Methodology;
- Receiving Environment
- Potential Effects;
- Mitigation Measures;
- Residual Impacts;
- Interactions; and
- Potential Cumulative Effects.

1.5 Consultation

Consultation is an on-going part of the EIA process. There are three elements of consultation which take place prior to the submission of an EIAR:

- (i) Statutory Consultation on the EIAR Scoping Document
- (ii) Public and Local Stakeholder Consultation on the proposed development and
- (iii) Statutory Consultation on Assessment of Effects and Mitigation within the EIAR.

The first avenue for consultation is to seek opinions and input from Statutory Consultees that have an interest or who may be affected by parts of the development, including government bodies and regulatory bodies. Non-governmental organisations and other relevant organisations were also contacted as part of this consultation process. These consultees were identified in the Scoping stage of the EIAR and were contacted as specified below.

The second avenue is to consult with local residents, business owners, and locals who may be impacted by the development or any member of the public who has an interest in the proposed development. This was undertaken through Public and Local Stakeholder Consultation events held throughout the scheme process.

The third consultation relates to specific Statutory Authorities in relation to key aspects of the site where designated features will be affected by the proposed development.

1.5.1 Statutory Consultation on EIAR Scoping Stage

In accordance with the EIA Directive (85/337/EEC) as amended in 2011 Directive (2011/92/EU) and 2014 Directive (2014/52/EU) under Article 6 and the Aarhus Convention, statutory and non-statutory bodies, local authorities, and relevant stakeholders must be consulted on the specific characteristics of the project and its likely impacts on the environment.

The EIAR requirements for consultation are defined in the EIA Directive (85/337/EEC) as amended in 2011 Directive 2011/92/EU and 2014 Directive 2014/52/EU under Article 6.

Article 6 (1)

"Member States shall take the measures necessary to ensure that the authorities likely to be concerned by the project by reason of their specific environmental responsibilities are given an opportunity to express their opinion on the information supplied by the developer and on the request for development consent."

On the 26th of May 2023, statutory and non-statutory consultees were issued the EIAR Scoping Report via email and were asked to submit any comments, observations, or submissions in relation to the proposed scope and level of information to be included in the EIAR.

The list of consultees who were sent a copy of the EIAR Scoping Report are:

- Department of Agriculture, Food, and Marine (DAFM)
- Department of Environment Climate and Communications (DECC)
- Department of Housing, Planning, and Local Government (DHPLG)
- Department of Transport, Tourism, and Sport (DTTS)
- Environmental Protection Agency (EPA)
- Geological Survey Ireland (GSI)
- Inland Fisheries Ireland (IFI)
- National Monuments Service (NMS)
- National Parks and Wildlife Service (NPWS)
- Office of Emergency Planning (OEP)
- Office of Public Works (OPW)
- Failte Ireland
- Transport Infrastructure Ireland (TII)
- Irish Water
- Health Service Executive (HSE)
- An Taisce-The national trust for Ireland (Local Association - Dublin South)
- Bat Conservation Ireland
- Birdwatch Ireland
- Coillte
- Irish Heritage Trust
- Irish Wildlife Trust
- Teagasc
- The Heritage Council
- Eastern and Midlands Regional Assembly
- Local Authority Waters Programme (LAWPRO)
- Irish Environmental Network
- Sustainable Water Network Ireland (SWAN)
- Dublin Fire Brigade
- South Dublin County Council (SDCC)

1.5.2 Statutory Consultation Responses to EIAR Scoping Report

Table 1-1: Scoping Reports Consultation Responses Received

Consultee	Response	Response Date
National Parks and Wildlife Service (NPWS)	Yes	29/05/2023 and 02/12/2025
National Monuments Service (NMS)	Yes	20/06/2023
Department of Environment Climate and Communications (DECC)	Yes	26/05/2023

Department of Housing, Planning, and Local Government (DHPLG)	Yes	26/05/2023
Faillte Ireland	Yes	27/06/2023
Geological Survey Ireland (GSI)	Yes	12/06/2023
Inland Fisheries Ireland (IFI)	Yes	21/06/2023
Irish Water	Yes	21/06/2023
Office of Public Works (OPW)	Yes	27/06/2023
Department of Agriculture, Food, and Marine (DAFM)	No	N/A
Department of Transport, Tourism, and Sport (DTTS)	No	N/A
Environmental Protection Agency (EPA)	No	N/A
Office of Emergency Planning (OEP)	No	N/A
Transport Infrastructure Ireland (TII)	No	N/A
Health Service Executive (HSE)	No	N/A
An Taisce-The national trust for Ireland (Local Association - Dublin South)	No	N/A
Bat Conservation Ireland	No	N/A
Birdwatch Ireland	No	N/A
Coillte	No	N/A
Irish Heritage Trust	No	N/A
Irish Wildlife Trust	No	N/A
Teagasc	No	N/A
The Heritage Council	No	N/A
Eastern and Midlands Regional Assembly	No	N/A
Local Authority Waters Programme (LAWPRO)	No	N/A
Irish Environmental Network	No	N/A
Sustainable Water Network Ireland (SWAN)	No	N/A
Dublin Fire Brigade	No	N/A
South Dublin County Council (SDCC)	No	N/A

1.5.3 Scoping Report

Responses to the Scoping Report are summarised in Table 1-2.

Table 1-2: EIAR Scoping Responses

Consultee	Response to written submissions and summary of issues raised	How the issue will be addressed in the EIAR
Chapter 3: Population and Human Health		
Fáilte Ireland – Received 27/06/2023	Fáilte Ireland confirmed that they have no comments on the EIAR Scoping request for the proposed development.	No issues were raised and no further action is required.
	GSI confirmed that there are no County Geological Sites (CGSs) in the vicinity of the proposed development. The response noted that the site overlies bedrock aquifers classified as Locally Important Aquifer (Moderately Productive in Local Zones) and Poor Aquifer (Generally Unproductive except for Local Zones), and recommended that groundwater vulnerability and protection mapping be considered as part of the assessment.	
Chapter 4: Biodiversity		
Inland Fisheries Ireland –Received 21/06/2023	Protection of Salmonid/Protected Species as the Liffey contains Atlantic Salmon, Brown Trout, Freshwater Crayfish and Lamprey.	Mitigation measures will be included in the CEMP accompanying this EIAR.
	Potential for deleterious material (concrete, silt, fuel, oils) to enter the watercourse from construction plant and material, which poses a risk to water quality and pollution.	Mitigation measures to prevent any deterioration to surface water bodies located within the scheme area will be outlined in the Water Chapter (6) of the EIAR.
	Necessity for pre-construction biotic and abiotic baseline data to assess impacts. Potential impacts (likely and significant effects) of the development on the system should be comprehensively assessed, and recommendations and mitigation measures should be formulated. The identification of good baseline data across a range of sites, both close to the development and at a distance from the site will allow for comparison between the current situation and that which may develop over time if the project proceeds.	
	The EIAR must refer to the “Planning for watercourses in the urban environment” document by IFI which can provide guidance on site specific measures to enhance, protect, rehabilitate or establish riparian and aquatic habitats.	All listed assessments will be addressed and included in the Biodiversity Chapter (4) of the EIAR.
	During the construction and operational phases, the applicant should adhere to the recommendations and guidelines outlined in IFI’s Guidelines on Protection of Fisheries during Construction Works in and adjacent to Waters 2016.	The IFI’s Guidelines on Protection of Fisheries during Construction Works in and adjacent to Waters 2016 will guide the formation of the CEMP and the Biodiversity Chapter (4) of the EIAR.
	Instream works may only take place during the period 1 July to 30 September. There should be no interference with the bed, gradient, profile or alignment of watercourses without prior	In-stream works are not anticipated to take place for this development. In

	notification and the agreement of Inland Fisheries Ireland. Natural flow paths should not be interrupted or diverted in a manner that would increase the risk of erosion.	the case of in-stream works being necessary, IFI guidance will be followed.
	Proposed instream works must be accompanied by a site-specific method statement provided to IFI. The applicant should provide a commitment to provide these at least ten working days before works commence. Written approval from IFI should be obtained before works proceed.	
	Where existing water crossings must undergo alteration, IFI request that these crossings are upgraded in the interests of habitat improvement and biodiversity enhancement. Crossings should be designed to meet IFI's Fisheries Construction Guidelines referred to above. IFI also recommends that the applicant refer to the OPW's Design Guidance For Fish Passage On Small Barriers (2021). IFI should be consulted at the design stage for any new crossings or alterations to existing crossings.	
	At all times the precautionary principle should be applied throughout the development. Particular attention should be paid to the various environmental directives including the Water Framework Directive, the Habitat and Birds Directives, the Fisheries Acts and the Local Government (Water Pollution) Acts. Other environmental legislation should be considered as appropriate.	Will be addressed in in the Water Chapter (4) of this EIAR.
	Provision should be made for the appointment of a suitably qualified Project Environmental Manager and Ecological Clerk of Works.	All of the works and mitigation measures will be monitored by a suitably qualified Environmental Clerk of Works (ECoW) during the construction period, with findings reported to the competent authority.
	Records should be kept of biological and chemical monitoring of undertaken for the development. Records should also be kept of inspections of proposed surface water mitigation measures. These records should be made available upon request to any authorised person as defined under the Local Government (Water Pollution) Acts.	Records will be kept and made available if upon request.
Chapter 5: Land and Soil & Chapter 6: Water		
Geological Survey Ireland – Received 12/06/2023	Geological Survey Ireland did not object and provided advisory comments and datasets. The response highlighted the availability of publicly accessible geological, hydrogeological and geochemical datasets relevant to EIAR preparation and legislation. The response included information on geoheritage, groundwater vulnerability and aquifer classification, geological mapping, aggregate potential, and baseline geochemistry.	The EIAR has been informed by appropriate Geological Survey Ireland datasets and mapping, including geological mapping, groundwater vulnerability and aquifer classification. The absence of designated geoheritage sites in the vicinity of the

		proposed development has been noted. Geological, hydrogeological and soils assessments have been undertaken with reference to GSI guidance and EPA EIAR guidelines, where relevant. No specific mitigation measures were requested by GSI.
Chapter 9: Material Assets		
Uisce Éireann – Received 21/06/2023	Where the development proposal has the potential to impact an Uisce Éireann Drinking Water Source(s), the applicant shall provide details of measures to be taken to ensure that there will be no negative impact to Uisce Éireann's Drinking Water Source(s) during the construction and operational phases of the development. Hydrological / hydrogeological pathways between the applicant's site and receiving waters should be identified as part of the report.	Items relating to water supply will be address in Chapter 9 Material Assets of the EIAR. Aspect of water quality will be addressed in Chapter 6 Water.

	Where the development proposes the backfilling of materials, a waste sampling strategy to ensure the material is inert is to be included. Mitigations should be proposed for any potential adverse impacts on any water source(s) which may be in proximity and included in the environmental management plan and incident response. Any and all potential impacts on the nearby reservoir as public water supply source(s) should be assessed, including any impact on hydrogeology and any groundwater/surface water interactions. Impacts of the development on the capacity of water services (i.e., do existing water services have the capacity to cater for the new development). This is confirmed by Uisce Éireann in the form of a Confirmation of Feasibility (COF). If a development requires a connection to either a public water supply or sewage collection system, the developer is advised to submit a Pre-Connection Enquiry (PCE) enquiry to Uisce Éireann to determine the feasibility of connection to the Irish Water network. All pre-connection enquiry forms are available from https://www.water.ie/connections/connection-steps/. The applicant shall identify any upgrading of water services infrastructure that would be required to accommodate the proposed development. In relation to a development that would discharge trade effluent – any upstream treatment or attenuation of discharges required prior to discharging to an Uisce Éireann collection network. In relation to the management of surface water; the potential impact of surface water discharges to combined sewer networks and potential measures to minimise and or / stop surface waters from combined sewers. Any physical impact on Uisce Éireann assets – reservoir, drinking water source, treatment works, pipes, pumping stations, discharges outfalls etc. including any relocation of assets. When considering a development proposal, the applicant is advised to determine the location of public water services assets, possible connection points from the applicant's site / lands to the public network and any drinking water abstraction catchments to ensure these are included and fully assessed in any pre-planning proposals. Other indicators or methodologies for identifying infrastructure located within the applicant's lands are the presence of registered wayleave agreements, visible manholes, vent stacks, valve chambers, marker posts etc. within the proposed site. Any potential impacts on the assimilative capacity of receiving waters in relation to Uisce	

	Éireann discharge outfalls including changes in dispersion / circulation characterises. Hydrological / hydrogeological pathways between the applicant's site and receiving waters should be identified within the report. Any potential impact on the contributing catchment of water sources either in terms of water abstraction for the development (and resultant potential impact on the capacity of the source) or the potential of the development to influence / present a risk to the quality of the water abstracted by Uisce Éireann for public supply should be identified within the report. Where a development proposes to connect to an Uisce Éireann network and that network either abstracts water from or discharges wastewater to a "protected"/ sensitive area, consideration as to whether the integrity of the site / conservation objectives of the site would be compromised should be identified within the report. Mitigation measures in relation to any of the above ensuring a zero risk to any Uisce Éireann drinking water sources (Surface and Ground water).	
Office of Public Works – Received 27/06/2023	OPW has no further comments.	Not applicable.
Department of Climate, Energy and Environment –Received 26/05/2023	DCEE has no further comments.	Not applicable.
Department of Housing, Local Government and Heritage – Received 26/05/2023	DHLGH has no further comments.	Not applicable.

1.5.4 Public and Local Stakeholder Consultation

A public consultation event was held on 18 November 2025 at St Edmundsbury House, Lucan, to present the proposals for the development of a new Mental Health Hospital and associated facilities on the Saint Edmundsbury campus. The purpose of the consultation was to provide both public representatives and members of the community with a clear understanding of the project vision, its key components, and the planning process ahead. The event was structured in two parts: a dedicated session for public representatives from 3:00 pm to 4:00 pm, followed by a public session from 4:00 pm to 5:00 pm. This structure ensured that elected representatives had the opportunity for focused engagement before the wider public discussions commenced.

Public Representatives (3:00 pm – 4:00 pm)

Cllr Caroline Brady and Cllr Helen Farrell attended the initial briefing. Their attendance was welcomed as a vital part of maintaining open communication with elected officials.

Members of the Public (4:00 pm – 5:00 pm)

Interest from the local community was strong. A total of 50 individuals registered to attend the consultation, and a further 10-15 community members joined without registration. This level of engagement reflects the significance of the project for residents in the Lucan area.

1.5.4.1 Feedback and Initial Reactions

Overall, the project was generally well received by those in attendance. Many participants expressed appreciation for the comprehensive overview provided by the design and planning team, and there was a shared recognition of the importance of delivering a modern Mental Health Hospital with connected facilities on the Saint Edmundsbury site. While the sentiment was broadly positive, a number of questions and comments were raised, reflecting the community's interest in the project and its potential implications.

Councillors' Queries (prior to public consultation):

- Concerns over intrusion into the proposed Natural Heritage Area (pNHA).
- Requested reasons why the building had to extend into the woodland.
- Asked for clarity over the Site of Archaeological and Architectural Interest (SAAO) and the pNHA boundaries.

Public Comments and Queries

- Majority of comments focused on traffic issues; these were addressed by Garry Flood (Egis).
- Questions about whether the existing walking loop would be retained.
- Queries regarding whether proposed visitor parking would be paid.
- Concerns about safety for school parents' vehicular drop-off during construction.
- Questions about the amount and type of native planting in the proposed landscaping scheme.
- Comments regarding safety of the proposed pond within the wetland area.
- Queries about whether the site is designated as a greenbelt that cannot be developed.
- Questions regarding whether local labour would be recruited to work in the hospital.
- Concerns about the appropriateness and safety of locating a mental health facility beside two schools.
- Queries regarding the proportion of secure facilities and patients who would be resident in the development.
- Additional concerns raised about access arrangements (vehicular and pedestrian), future traffic volumes, and the maintenance of the existing walking route.

1.5.4.2 Written Feedback

In addition to questions raised during the sessions, written comments were received from attendees. On the evening of the consultation, 11 comments were submitted on cards, with a further comment received by email since the event. An analysis of these written submissions was

conducted and is listed in Table 1-3 below to identify the key areas of concern and ensure that all feedback is considered in the ongoing development and planning process. Six main areas of interest were identified:

Table 1-3: Public Consultation Summary of Comments

Area of Interest	Comments
Traffic	- Concern about increased impact on already heavy traffic on the road - Traffic access and parking sufficiency questioned - Any increase of traffic into an already clogged roadway is a concern - Issues caused by toll-bridge avoiders creating rat-run traffic - Concern about traffic close to Esker Lane and through the village - Worry that traffic will build up and block the road near the school, where lanes merge - Email: Safety concerns at the entrance, particularly with children crossing by foot or bike near the school. - Email: Concern that patients may need to travel by car due to vulnerability or long-distance journeys. - Email: Concern that access routes may not cope with demand.
Parking	- Issues raised about parking numbers by residents closest to the expansion - Concern about whether parking provision is sufficient - Email: Concern that the proposed 215 spaces may be inadequate. - Email: Worry that if the car park is full, visitors will park in nearby estates (comparison to Crumlin Hospital). - Email: Query on how the 215 spaces were calculated (size vs. usage). - Email: Concern that limited public transport makes car travel necessary for many. - Email: Concern about shift patterns and limited public transport at weekends reducing staff ability to avoid car use. - Email: Request for contingency plans if parking proves insufficient.
Public Transport	- Request for engagement with TFI regarding increasing C3/C4 bus services - Existing problem with bus frequency; buses already full going into town - Increase in bus numbers suggested - Email: Patients may not be able to use public transport due to mental health vulnerability. - Email: Lucan not well connected to areas outside Dublin/Kildare suburbs. - Email: Existing bus services do not support staff shift times, especially weekends. - Email: Concern that sustainable transport assumptions may not be realistic
Ecology/Heritage	- Maintaining existing walking route down to Liffey Valley Park - Strong importance placed on green/ecology of the site - Preserve old stone walls/buildings and large trees - Email: Commends the preservation of green space and biodiversity. - Email: Highlights importance of green space for healing, health, and stress management.
Community	How will the local community benefit from this development?

Benefits	• Interest in something being done with the gate lodge, e.g., a coffee shop
Construction Impact	• Concern about construction traffic • Email: Concern that children crossing the road near the entrance during construction could be at risk. • Email: Questions about mitigating construction-phase access issues.

1.5.5 Statutory Consultation

Table 1-4 below details the meetings that took place to discuss the assessment of effects on sensitive and designated features.

Table 1-4: Summary of Consultation with Statutory Authorities

Consultee	Comments and summary of issues raised	How the issue is addressed in the EIAR
Chapter 4: Biodiversity		
Development Applications Unit (DAU) – NPWS meeting held 02/12/2025	The proposed development needs to consider any potential impact on ecology and the proposed Natural Heritage Area (pNHA).	Mitigation measures are included in the Biodiversity Chapter (4) of this EIAR. Minutes of the meeting are included in Appendix 1. Lighting design includes optically controlled fittings and is detailed in the Bar Report in Appendix 4. Details of compensational woodland are included in Chapter 4 and illustrated on the proposed landscape design which forms part of this planning application. Details of all biodiversity surveys are included in the Biodiversity Chapter (4).
	The proposed development encroaches into the Liffey Valley pNHA and the Liffey Valley Special Amenity Area Order (SAAO), which main contain protected species.	
	A bat derogation licence may be required as part of the EIAR. In the case a multiple year licence being granted, new surveys would have to be carried out before demolition and tree felling if there is a fair interval between the grant date and the start of the construction works.	
	Specific internal lighting needs to be adopted as it can have negative effects on bat populations.	
SDCC Heritage Officer Rosaleen Dwyer – Site meeting held 30/05/2023	The loss of natural and ancient woodland and the lack of bat roosts in the trees and buildings on the current site is concerning.	
	SDCC Heritage Officer was concerned about the impact of the development on the proposed Natural Heritage Area.	
	SDCC requested that full seasons of surveys were completed and included within EclA	
Chapter 9: Material Assets		
South Dublin County Council and EGIS – In person meetings and communication between X and X Received 12/02/2025	SDCC wish to inform the client of the proposed St. Patrick's hospital development that it is broadly supportive of the intended planning application subject to the several additional planning conditions outlined below being attached to any decision on planning permission.	Potential impacts on the road network during construction stages have been assessed in the Material Assets Chapter (9) of the EIAR. Population and Human Health Chapter 3. Potential visual impacts from nearby receptors including the road network are assessed in the LVIA Chapter (11) of the EIAR. Potential cumulative effects have been assessed in each chapter by the relevant chapter author and are collated in Chapter 12. The Traffic and Transport Document is included in Appendix 9.
	The existing Lucan Road /Chapel Hill Road junction is overcapacity at peak travel times. While it is accepted that much of the congestion is existing background traffic, the Council remained concerned about adding additional traffic to the overloaded junction without upgrading the junction to allow the proposed development to take place. Therefore, the Council proposes that the applicant contribute a proportion of the costs of the junction upgrade.	
	The developer shall pay a special contribution to the planning authority in respect of specific exceptional public infrastructure costs for facilities that will benefit this development within the area of the planning authority, that is provided or intended to be provided by or on behalf of the authority, in accordance with Section 48(2) c of the Planning and Development Acts 2000 (as amended).	
	Accordingly, the developer shall pay a special contribution of €150,000 to South Dublin County Council as part of the financial cost required to install a fully signalised junction at the	

	Lucan Road / Chapel Hill Road junction.	The new wall boundary is shown in the architectural drawings in the Landscape and Visual Amenity Chapter (11) of this EIAR.
	South Dublin County Council shall build the signalised junction at the Lucan Road /Chapel Hill junction within an agreed timeframe.	
	The applicant shall sell the required additional land to South Dublin County Council necessary to build the fully signalised junction. The applicants engineering consultants (Egis), have produced a drawing outlining the setback required for the proposed signalised junction with cycle and pedestrian linkages included. The value of the land ceded to the Council shall be taken off the €150,000 contribution. The value of the land ceded will be calculated by an independent chartered land valuer.	
	The applicant shall, as part of their works, demolish part of the existing stone boundary wall (63 lin.m) and rebuild it set back sufficiently, to allow the building of the signalised junction.	
SDCC Architectural Conservation Officer Irenie McLoughlin – Site meeting held 30/05/2023	SDCC is broadly supportive of the proposed development.	Details of the incorporation of architectural assets are included in the Cultural Heritage Chapter (10) and architectural plans of this EIAR.
	SDCC approves of the retention of above ground architectural assets within the site and their incorporation into the design.	

1.6 EIAR Team

The EIAR has been compiled by JBA Consulting with input from a range of competent experts, the details of which are outlined in Table 1-5. Each consultant is appropriately qualified and competent in accordance with Article 5(3)(a) of the EIA Directive and Section 172(1B) of the Planning and Development Act 2000, as amended.

Table 1-5: EIAR team

Chapter	Consultant	Author
Introduction	JBA Consulting	Conor O'Neill B.A. (Mod) M.Sc. Dip Planning and Env Law Bernadette O'Connell BA MSc CMLI PgCert
Planning Policy and Planning History	Tom Philips + Associates,	Órla Casey BA MPlan PGCert (MSP) MIPI John Gannon BSc MRUP Dip (Property Econ) MIPI
Description of Proposed Development	JBA Consulting	Conor O'Neill B.A. (Mod) M.Sc. Dip Planning and Env Law Bernadette O'Connell BA MSc CMLI PgCert
Population and Human Health	JBA Consulting	Justin Nangle B.Sc. Hons Env Sc Conor O'Neill B.A. (Mod) M.Sc. Dip Planning and Env Law
Biodiversity	JBA Consulting	William Mulville BSc (Hons), MSc Patricia Byrne BSc PhD MCIEEM
Land and Soil	JBA Consulting	Jemima Kivikoski B.Sc (Hons), PgD Env Sc Conor O'Neill B.A. (Mod) M.Sc. Dip Planning and Env Law
Water – Surface and Groundwater	JBA Consulting	Luigi Arbore BSc MSc Meng Sc David Casey BSc MSc MCIWEM
Air and Climate	AONA Environmental Consulting Ltd	Mervyn Keegan BSc. Dip Env Sc. MSc Env Sc. PgDip. Olivia Maguire BSc. MSc Env Sc. BSc
Noise and Vibration	AONA Environmental Consulting Ltd	Mervyn Keegan BSc. Dip Env Sc. MSc Env Sc. PgDip.
Material Assets	JBA Consulting	Justin Nangle B.Sc. Hons Env Sc Conor O'Neill B.A. (Mod) M.Sc. Dip Planning and Env Law
Cultural Heritage: -Archaeology -Architectural Heritage	ACAS Carrig Conservation	Aisling Collins BA PG Dip Maritime Archaeology MIAI Tim Dowling, B.Arch PgDip RIAI Accredited Architect Christell Dulon Architect MRAI and Architect Accredited in Conservation at Grade 3
Landscape and Visual Impact Assessment	JBA Consulting	Jemima Kivikoski B.Sc (Hons), PgD Env Sc Christos Papachristou MSc MA CMLI
Interactions	JBA Consulting	All of the above
Cumulative Impacts	JBA Consulting	All of the above
Schedule of Mitigation	JBA Consulting	Conor O'Neill B.A. (Mod) M.Sc. Dip Planning and Env Law Bernadette O'Connell BA MSc CMLI PgCert

1.7 Description of Effects

This EIAR follows the guidance set out in the Environmental Protection Agency's (EPA) Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022) in relation to describing accurately the full range of likely significant effects, Table 1-6 is

taken from the EPA's EIAR Guidelines (2022) and provides a classification of significance of effects (or impacts).

The EPA Guidelines (2022) outline that the probability of effects can be described as likely or unlikely and the duration of effects can range from momentary, brief, temporary, short-term, medium-term, long-term, permanent, or reversible while the frequency describes how often the effects will occur (Table 1-6). The quality of effects can be described as positive, neutral or negative/adverse with varying degrees of significance (Table 1-6).

1.8 Study Area

The study area for the proposed development is shown overleaf in Figure 1-1, it is located east of Lucan town centre, south Dublin. The site comprises a series of established hospital buildings and historical stone walls and artefacts all set within extensive woodland belts and open grassland. The site is bounded to the north by farmland, a school and a farmyard area located on the eastern boundary, a pre-school to the west, with the River Liffey beyond. Lucan Road is to the south with a residential area beyond.

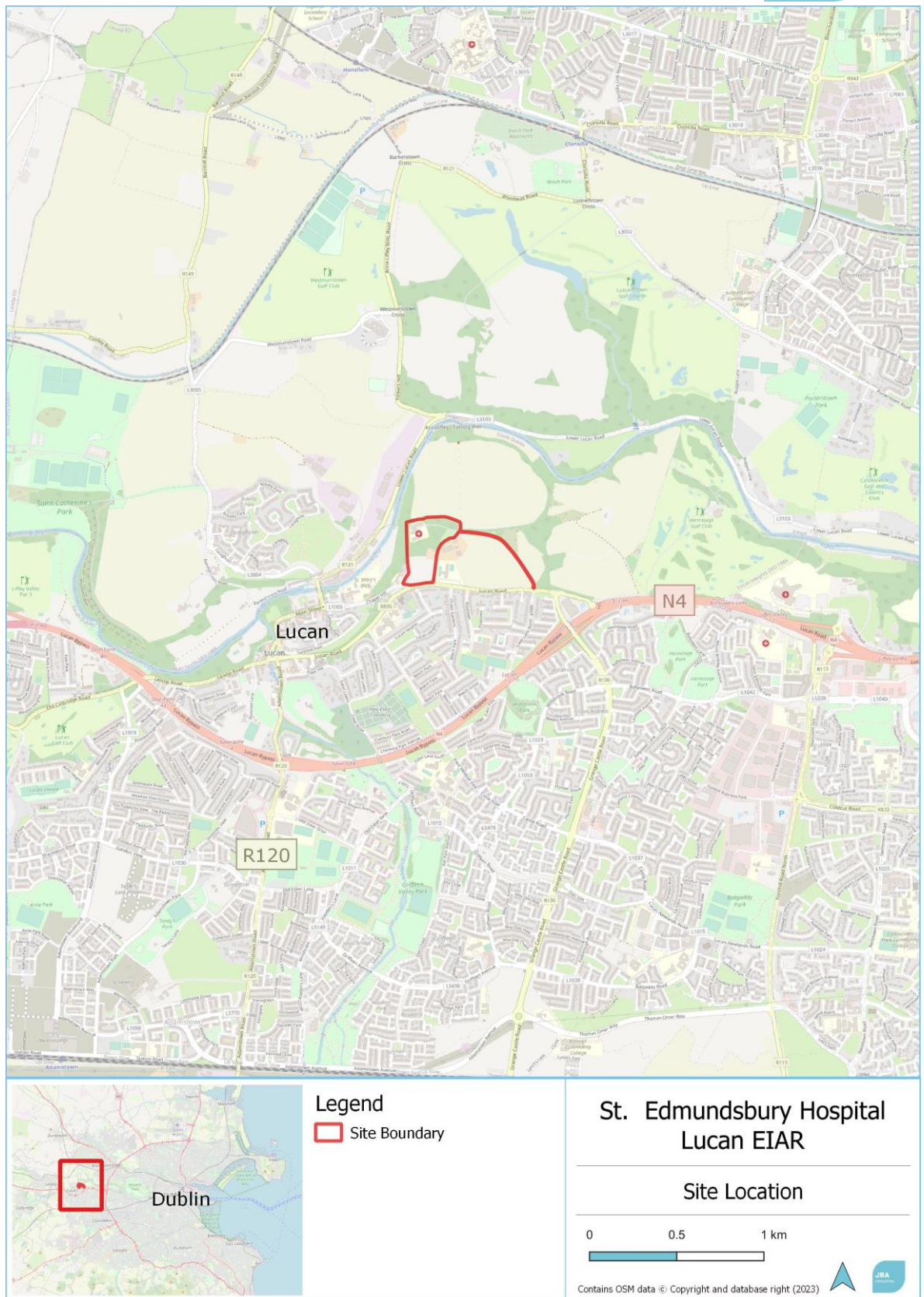


Figure 1-1: Location Plan



Figure 1-2: Site Plan taken from TOT Architects

Table 1-6 Description of Effects (EPA, 2022)¹

Quality of Effects	Positive Effects - A change which improves the quality of the environment
	Neutral Effects - No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative/Adverse Effects - A change which reduces the quality of the environment.
Describing the Significance of Effects	Imperceptible - An effect capable of measurement but without significant consequences.
	Not Significant - An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight Effects - An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate Effects - An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant Effects - An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
	Very Significant - An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
	Profound Effects - An effect which obliterates sensitive characteristics.
Describing the Extent and Context of Effects	Extent - Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
	Context - Describe whether the extent, duration or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)
Describing the Probability of Effects	Likely Effects - The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects - The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing the Duration and Frequency of Effects	Momentary Effects - Effects lasting from seconds to minutes.
	Brief Effects - Effects lasting less than a day.
	Temporary Effects - Effects lasting less than a year.
	Short-term Effects - Effects lasting one to seven years.
	Medium-term Effects - Effects lasting seven to fifteen years.
	Long-term Effects - Effects lasting fifteen to sixty years.
	Permanent Effects - Effects lasting over sixty years.
	Reversible Effects - Effects that can be undone, for example through remediation or restoration.
Describing the Types of Effects	Frequency of Effects - Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).
	Indirect Effects - Effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
	Cumulative Effects - The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.
	'Do-nothing Effects' - The environment as it would be in the future should the subject project not be carried out.
	'Worst-case' Effects - The effects arising from a project in the case where mitigation measures substantially fail.
	Indeterminable Effects - When the full consequences of a change in the environment cannot be described.
	Irreversible Effects - When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
	Residual Effects - The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic Effects - Where the resultant effect is of greater significance than the sum of its constituents (e.g. combination of SO _x and NO _x to produce smog).

¹ Environmental Protection Agency (May 2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports. Environmental Protection Agency, Ireland

1.9 Site designations

Figure 1-4 shows the designations covering the site and its surrounds from the South Dublin County Development Plan 2022-2028. The site is adjacent to a Special Amenity Area Order which wraps around the western part of the site, additionally a proposed Natural Heritage Area woodland is within the centre of the site. There are five features from the Record of Protected Structures within the site boundary, and the site is within an area covered by Specific Local Objective EDE20 SLO:1.

1.10 Planning Policy Provisions

This section sets out the relevant guidance and policy objectives to be considered in relation to the proposed development site. Firstly, this section considers the broad level national strategic objectives, guidelines and policies adopted by the Irish Government in relation to healthcare. Secondly, this section provides an overview of the regional context of the proposed site and lastly will consider local objectives and development standards as indicated within the county development plan.

1.10.1 National Policy

1.10.1.1 National Planning Framework 2040 First Revision (Updated April 2025)

The National Planning Framework (NPF) is the Government's high-level strategic plan for shaping the future growth and development of Ireland, to the year 2040. The NPF sets out a new Region-focused strategy for managing growth and a framework for the use of state lands for certain strategic purposes. This is supported by strengthened, more environmentally focused planning at local level. The revised NPF builds on the original 2018 framework and incorporates key changes in Government policy, reflecting updated priorities in relation to climate action, regional development, demographic change, digital transformation, infrastructure investment, and spatial resilience. The revised NPF continues to guide national planning and investment to accommodate projected growth, including the anticipated increase of over one million people living in Ireland, over 660,000 additional jobs, and the requirement for more than 500,000 new homes by 2040.

The Framework retains a strong emphasis on:

- Compact and sustainable growth in cities, towns and rural communities;
- Delivering climate-responsive and accessible urban centres of scale;
- Integrated planning and investment to improve outcomes for communities, services and the environment.

Dublin continues to be recognised as an international city of scale and is considered central to national economic competitiveness and innovation. The revised NPF places increased emphasis on the delivery of compact, low-carbon, place-based development within the existing urban footprint, supported by investment in public services and infrastructure.

A core strategic outcome remains universal access to quality health services, framed in the context of regional equity, social inclusion and the 15-minute neighbourhood model. The NPF sets out that:

"Equitable access to quality healthcare and social services is central to sustainable communities. Urban consolidation and rural renewal will enable the delivery of modern, accessible health infrastructure embedded within the fabric of daily life."

Relevant National Policy Objectives (NPOs) are noted as follows:

- **NPO 36** – Support the objectives of public health policy including the Healthy Ireland Framework and the National Physical Activity Plan, though integrating such policies, where appropriate and at the applicable scale, with planning policy.
- **NPO 37** – Ensure the integration of safe and convenient alternatives to the car into the design of our communities, by prioritising walking and cycling accessibility to both existing and proposed developments and integrating physical activity facilities for all ages.

- **NPO 40** – Local planning, housing, health facilities and services, transport/ accessibility and leisure policies will be developed with a focus on meeting the needs and opportunities of an ageing population along with the inclusion of specific projections, supported by clear proposals in respect of ageing communities as part of the core strategy of city and county development plans.

In addition, the following National Strategic Outcome is noted as being relevant:

- **NSO 10:** Healthy Communities and Healthcare Services in the Community.

NSO10 provides a robust policy basis for the delivery of specialist mental health infrastructure in Ireland. The NPF emphasises that;

“the development of new healthcare facilities requires that consideration be given to the location, number, profile and needs of the population to ensure access to the most appropriate care, while also ensuring quality of care, particularly in relation to more complex acute hospital services.”

This principle supports locating a mental health hospital where it can best serve identified regional need, with regard to accessibility and integration into the wider healthcare network. The document specifically commits to the “replacement and provision of additional acute mental health units, residential accommodation and modern facilities for adults and children on a national basis.” This clear national priority directly aligns with the delivery of a new, purpose-built mental health hospital, providing the high-quality, fit-for-purpose facilities required to meet modern standards of care and regulatory compliance under the forthcoming revised Mental Health Act.

NSO 10 also highlights the importance of “timely and accessible care... allied to person-centred and recovery-orientated principles” through implementation of the “Sharing the Vision 2020– 30” mental health policy and “Connecting for Life” suicide reduction strategy. These policy commitments underscore the need for facilities capable of delivering specialist, multi-disciplinary treatment in environments designed to support recovery and community reintegration.

Furthermore, the framework recognises that enhanced regulation of community mental health services will “require significant built environment enhancement”. This provides an explicit planning rationale for investment in modern, compliant facilities, ensuring that infrastructure keeps pace with regulatory and clinical requirements.

Finally, NSO 10 frames healthcare infrastructure within an integrated health and social care model, noting the role of “technologies, digital and data sharing capabilities... including virtual and digitally enabled care”. A new mental health hospital can be designed from the outset to incorporate these capabilities, aligning with national ambitions for a digitally enabled, resilient healthcare system.

In planning policy terms, NSO 10 offers direct and specific national-level support for the development of modern acute and residential mental health facilities, both to meet identified population needs and to deliver services in line with national mental health strategies, statutory regulation, and best practice care models.

In summary, the proposed development aligns with the goals and objectives of the NPF, particularly with core National Strategic Outcome No. 10 regarding access to quality health services. The needs of the growing population can be met in part by the provision of the proposed development.

Such a development also holds the potential to secure National Policy Objectives for population and employment growth, while strengthening our urban places. The new facility will bring an increased number of jobs to the greater Dublin area. The redevelopment of the subject site will provide increased mental health care for not only Dublin’s population but also the greater region.

1.10.1.2 Sláintecare 2025+ (2025)

Sláintecare 2025+ (2025) sets out a coordinated programme of reform over the period 2025 to 2027, with the objective of advancing a more integrated and universally accessible health service. Building on earlier phases of implementation, the approach reflects a clear policy direction towards the delivery of care at community level, reducing reliance on acute hospital settings and improving overall service accessibility. Key measures include the continued rollout of primary care centres, expansion of community healthcare networks, and investment in enabling infrastructure such as digital health systems and regional service structures. In planning terms, this represents a shift towards a more distributed model of service provision, aligned with population need and supported by enhanced workforce capacity and organisational reform.

The implementation of Sharing the Vision, together with the National Mental Health Promotion Plan and a successor to the existing suicide reduction strategy, indicates a whole system approach encompassing prevention, early intervention and specialist care. From a spatial planning perspective, there is a clear emphasis on embedding mental health services within community settings and existing healthcare infrastructure. This supports the broader objective of accessible, locally delivered care, though it suggests that future requirements for dedicated mental health facilities may arise incrementally as part of integrated service expansion. In this regard we note that the plan states; “Mental Health Promotion: A new National Mental Health Promotion Plan was launched in December 2024. Pathways to Wellbeing, our National Mental Health Promotion Plan, is Ireland’s first National Mental Health Promotion Plan, fulfilling a policy commitment set out in both Sharing the Vision: A Mental Health Policy for Everyone and in the Healthy Ireland Strategic Action Plan. The Plan shifts our focus beyond individually oriented clinical services to stronger protective factors and enhanced supports for good mental health.”

The proposed development is in line with Sláintecare as it aims to provide timely access to essential medical care and increase capacity in mental health services in Ireland. The facility aims to focus on ensuring patient wellbeing by providing different levels of care across out-patients and in-patients.

1.10.1.3 Sharing the Vision – Implementation Plan 2025-2027

The ‘Sharing the Vision (StV)- A mental health policy for everyone 2020-2030’ ensures the enhanced provision of mental health services in Ireland. The Plan is underpinned by four domains; these are listed as follows:

- i) Promotion, Prevention and Early Intervention;**
- ii) Service Access, Coordination and Continuity of Care;**
- iii) Social Inclusion and**
- iv) Accountability and Continuous Improvement”. [Our Emphasis]**

The proposed development is in line with the Plan’s underpinning objectives, the provision of mental health services often includes ensuring there is the availability for continuation of care over prolonged periods of time. The redevelopment of St. Edmundsbury includes a range of services that provide a multitude of levels of care, ensuring the patient’s well-being throughout one’s journey of care.

The Plan focuses on the promotion of positive mental health, by improving access to mental health services including children and younger people. The proposed development is in line with the Plan’s priorities as there are to be services provided for adolescent patients. The core values of the Plan include the following;

- “Domain 1- Promotion, Prevention and Early Intervention;
- Domain 2 - Service Access, Co-ordination and Continuity of Care;
- Domain 3 - Social Inclusion;
- Domain 4 - Accountability and Continuous Improvement”.

The proposed development will aid in achieving the Plan's four main domains for improving mental health facilities within Ireland. The redevelopment of St. Edmundsbury will provide increased availability of mental health services to adolescents and adults.

In summary the proposed development will help achieve the objections and aspirations to create a healthier Ireland as outlined in the Sharing the Vision-Implementation Plan 2022- 2024.

1.10.2 Regional Policy

1.10.2.1 The Eastern and Midland Regional Assembly, Regional Spatial and Economic Strategy 2019-2031

The Regional Spatial and Economic Strategy (RSES) is a strategic plan spanning over two decades, providing a roadmap to manage planning and economic development to shape the future of the Eastern and Midland Region. The RSES is underpinned by three key principles, focusing on ensuring healthy placemaking, by creating places that are attractive to work and live promoting the quality of people's life above as a top priority. Enhance climate resilience, and to create opportunities to achieve the Region's economic growth.

There are a number of key transport infrastructure investments set out within the Dublin Metropolitan Area Strategic Plan (MASP) for the greater area of Dublin. The document outlines proposals for two Strategic Development Corridors to Finglas and Lucan unlocking long-term capacity and providing connectivity to strategic landbanks. Section 5.4 of the Plan states it is envisioned the Luas line's extension to Lucan will be expected for post- 2027.

The proposed development is in line with a number of Regional Strategic Outcomes such as No. 1 'Sustainable Settlement Patterns', geared towards ensuring the sustainable and compact growth of Dublin City as an international city. The development and enhancement of the subject site satisfy RSO No. 2 'Compact Growth and Urban Regeneration', as the proposed aims to restore a number of existing buildings and utilise the site to its full capacity. This outcome is as follows:

"Promote the regeneration of our cities, towns and villages by making better use of under-used land and buildings within the existing built-up urban footprint and to drive the delivery of quality housing and employment choice for the Region's citizens. (NSO 1)". [Our Emphasis]

The development also contributes to RSO No. 4 'Healthy Communities', the provision of a health care facility of increased capacity should be acceptable as it meets the following:

"Protect and enhance the quality of our built and natural environment to support active lifestyles including walking and cycling, ensure clean air and water for all and quality healthcare and services that support human health. (NSO 10)". [Our Emphasis]

The Policy discusses health services within the Midland Region, as the provision of such is key in ensuring a healthier population and alleviating tertiary care. The document identifies that there are gaps in the Region's current healthcare infrastructure, placing an emphasis on ensuring there are adequate primary care, acute care, and social care services.

Figure 1-2 shows current mental health facilities permitted and planned in the Greater Dublin area. Table 1-7 in Appendix 1 describes the nature of the individual planning applications.

"Provision of Health Services RPO 9.23: Facilitate the development of primary health care centres, hospitals, clinics, and facilities to cater for the specific needs of an ageing population in appropriate urban areas in accordance with RSES settlement strategy and core strategies of development plans". [Our Emphasis]

The protection and integration of heritage resources in urban regeneration are addressed in RSO No. 5 'Creative Places'. The outcome focuses on the protection and restoration of cultural/heritage assets to integrate these structures into the urban fabric, creating interesting places to work and live. The redevelopment of Saint Edmundsbury will restore the currently derelict outbuildings on site, allowing these structures to be utilised and form a part of the Lucan area. The restoration of such will incorporate a number of structures that represent a key period in history for the area.

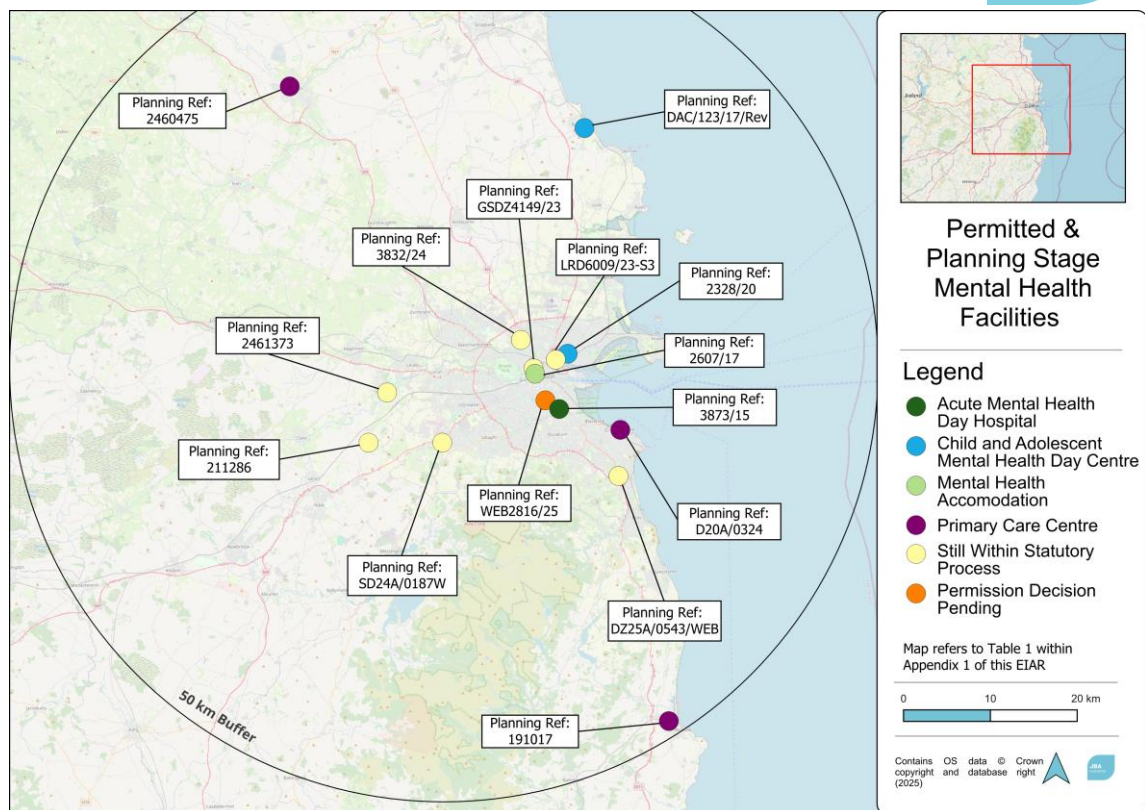


Figure 1-3 Current Mental Health Facilities in Greater Dublin area, permitted and in planning

To summarise, much of the policies and objectives contained in the RSES emulate those which are laid out within the NPF. The potential for the expansion and intensification of existing health services is evident. Policies on the growth of employment and population (particularly employment-led population growth) highlight the way the proposed development has the likely potential to align with regional policies.

1.10.3 South Dublin County Development Plan 2022-2028

A review of the South Dublin County Development Plan 2022-2028 was undertaken as a part of this Report. There are a number of policies and objectives in support of the proposed development, these are outlined in further detail below.

1.10.3.1 Zoning and other Designations

It is an objective of the Development Plan to ensure the protection of the Liffey Valley; there are specific land use zoning and designations applied to lands in and surrounding the valley. Due to the subject site's central location in the River Liffey Valley, the following is deemed to be of relevance.

The site is primarily zoned as 'Objective HA: To protect and enhance the outstanding natural character of the River Liffey', please see Figure 1-4. There are also a number of land use designations present on the subject land; this is outlined in detail below.

"High Amenity Liffey Valley (HA-LV): To protect and enhance the outstanding character and amenity of the Liffey Valley". **[Our Emphasis]**

The classes of use related to the land use zoning "Objective HA-LV", are addressed in Table 12.13 in Chapter 12.2 Land-Use Zoning Objectives of the Development Plan, these are listed as follows.

"Permitted in Principle: Open Space;

Open for Consideration: Agriculture, Allotments, Bed & Breakfast, Car Park, Cemetery, Childcare Facilities, Community Centre, Cultural Use, Doctor / Dentist, Education, Embassy, Guest House, Home Based Economic Activities, Hotel / Hostel, Place of Worship, Public House, Public Services, Recreational Facility, Residential Restaurant / Café, Rural Industry- Food, Shop-Local, Sports Club / Facility, Traveller Accommodation;

Not Permitted: Abattoir, Advertisements and Advertising Structures, Aerodrome / Airfield, Betting Office, Boarding Kennels, Camp Site, Caravan Park-Residential, Concrete / Asphalt Plant in or adjacent to a quarry, Conference Centre, Crematorium, Data Centre, Enterprise Centre, Fuel Depot, Funeral Home, Garden Centre, **Health Centre**, Heavy Vehicle Park, **Hospital**; Housing for Older People, Industry-Extractive, Industry-General, Industry-Light, Industry-Special, Live-Work Units, Motor Sales Outlet, Nightclub, Nursing Home, Office-Based Industry, Offices less than 100 sq m, Offices 100 sq m-1,000 sq m, Offices over 1,000 sq m, Off-Licence, Outdoor Entertainment Park Petrol Station, Primary Health Care Centre, Recycling Facility, Refuse Landfill / Tip, Refuse Transfer Station, Residential Institution, Retail Warehouse, Retirement Home, Science and Technology Based Enterprise, Scrap Yard, Service Garage, Shop-Major Sales Outlet, Shop- Neighbourhood, Social Club, Stadium, Transport Depot, Veterinary Surgery, Warehousing, Wholesale Outlet, Wind Farm, Work-Live Units". **[Our Emphasis]**

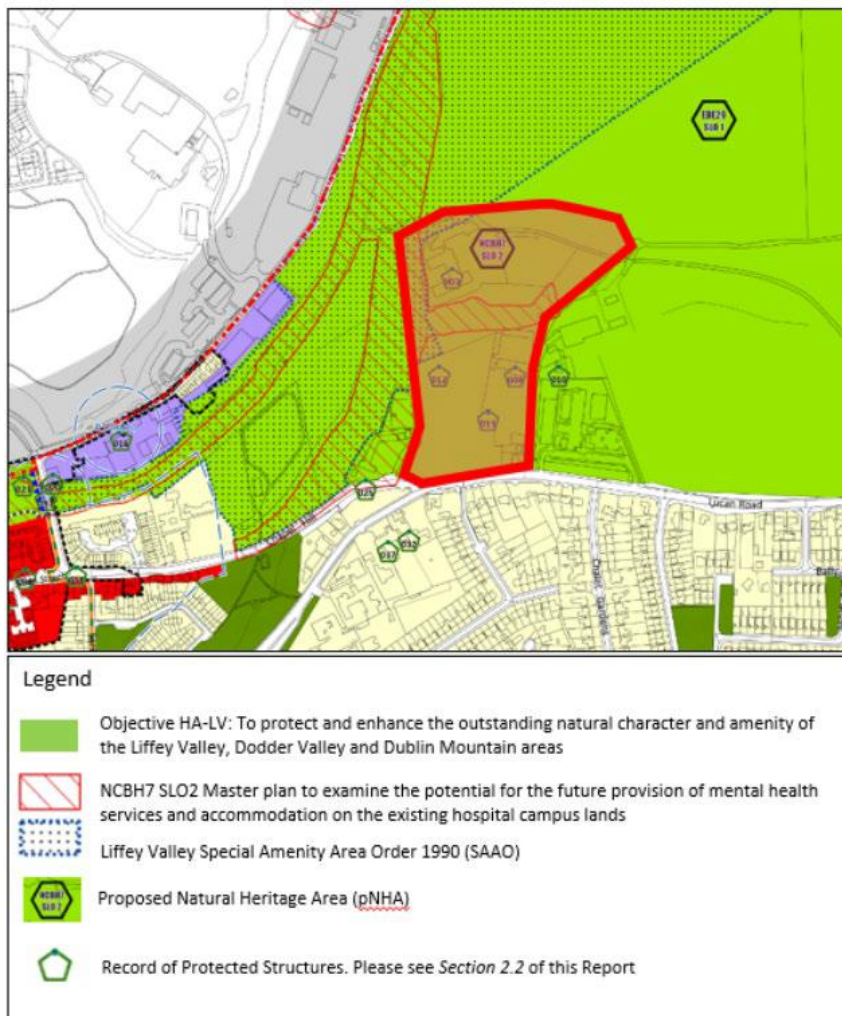


Figure 1-4 Site Designations, extract from SDCDP 2022-2028

The 'HA-LV' land use zoning states developments such as hospitals are not to be permitted. However, there is the provision to provide developments that are not residential subject to

certain circumstances under Planning Objective 'NCBH7 Objective 2'. The development standards associate with the HA-LV land use zoning are further outlined below.

NCBH7 Objective 1: To restrict development within areas designated with Zoning Objective 'HA-LV' (To protect and enhance the outstanding character and amenity of the Liffey Valley) and to **ensure that new development:**

- **Does not significantly impact on built or cultural heritage assets, on sensitive habitats, species, or ecosystem services;**
- **Is related to the area's amenity potential;**
- **Is designed and sited to minimise environmental and visual impacts; and;**
- **Enhances the County's green infrastructure network". [Our Emphasis]**

It is an objective of the Plan to ensure all future development within the Liffey Valley not only has regard for but also enhances the receiving environment. The Plan has aspirations to facilitate the improvement and expansion of the County's green infrastructure network.

"NCBH7 Objective 2: Within areas designated 'High Amenity – Liffey Valley' ('HA- LV'), non- residential development will only be permitted where it:

- **Relates to the area's amenity potential or to its use for agriculture or recreational purposes, including recreational buildings; or**
- **Comprises the redevelopment of or extensions to existing commercial or civic uses or development of new commercial or civic uses within an existing established area of commercial or civic activity; and**
- **Preserves the amenity value of the river valley including its biodiversity value, its landscape value, and views or vistas of the river valley". [Our Emphasis]**

Under NCBH7-Objective 2 non-residential development is acceptable in theory if the proposed development is in relation to the extension or the redevelopment of an existing commercial/civic use building. St Edmundsbury has operated as a hospital for a number of decades and therefore is a well-established use within the Liffey Valley. Upon considering these facts alongside the established and pressing need for more health care facilities/infrastructure, we are of the opinion that the proposed redevelopment of the site should be permitted in principle. This is explored further in the enclosed Planning Report prepared by Tom Phillips + Associates.

1.10.3.1 *Protected Structures*

There are six registered Protected Structures within the curtilage and surrounds of St. Edmundsbury House. These have been assessed by the Project Conservation Specialist. In this regard we note that the following are of relevance to the proposed development; RPS Ref Nos. 003, 008, 012, 013.

The South Dublin County Development Plan (2022-2028) states the following with regard to the development proposals involving officially designated Protected Structures:

"Policy NCBH19: Protected Structures Conserve and protect buildings, structures and sites contained in the Record of Protected Structures **and carefully consider any proposals for development that would affect the setting, special character or appearance of a Protected Structure including its historic curtilage, both directly and indirectly.**

NCBH19 Objective 2: To ensure that all development proposals that affect a Protected Structure and its setting **including proposals to extend, alter or refurbish any Protected Structure are sympathetic to its special character and integrity and are appropriate in terms of architectural treatment, character, scale and form. All such proposals shall be consistent with the Architectural Heritage Protection Guidelines for Planning Authorities, DAHG (2011 or any superseding documents) including the principles of conservation.**

NCBH19 Objective 3: To address dereliction and to welcome, encourage and **support the rehabilitation, renovation, appropriate use and sensitive re-use of Protected Structures consistent with RPO 9.30 of the RSES.**

NCBH19 Objective 4: To support alternative uses for Protected Structures including former institutional sites in order to provide continued security of the heritage value of these buildings, attendant grounds and associated landscape features. To this end, the relaxation of site zoning restrictions may be considered in order to secure the preservation and conservation of the protected structure where the use proposed is compatible with the existing structure and where the proposed development is consistent with best practice conservation policies and the proper planning and sustainable development of the area". **[Our Emphasis]**

It is submitted that the presence of these structures has informed the subject application, with the subject proposal striving to integrate these Protected Structures into the design and use of the proposed development.

The reuse and integration of these structures within the subject proposal is further detailed within the accompanying Architectural Heritage Impact Assessment prepared by Carrig Conservation International, which precisely addresses the integration of each Protected Structure in to the subject proposal.

The proposed development thus represents the appropriate reuse, and therefore 'conservation in use' of these Protected Structures, thus adhering with the key development plan objectives and requirements of the South Dublin Development Plan 2022-2028 concerning heritage and Protected Structures.

1.10.3.2 *Designations*

The subject lands are located with the Liffey Valley, due to the sites sensitive location there are a number of designations that bare relevance in this instance. The Development Plan states the following in relation to the River Liffey;

- The valley is a proposed Natural Heritage Area (pNHA);
- The Liffey Valley is identified as a Strategic Corridor, the "Liffey Valley Corridor";
- There is also a special amenity order in place to preserve the Liffey Valley. This is further discussed in detail below.

1.10.3.3 *Proposed Natural Heritage Area*

The River Liffey Valley is a designated proposed Natural Heritage Area (pNHA), once a site is proposed to be a NHA it is awarded EU-level protection. The Development Plan outlines several planning objectives regarding pNHAs, these are outlined in further detail below.

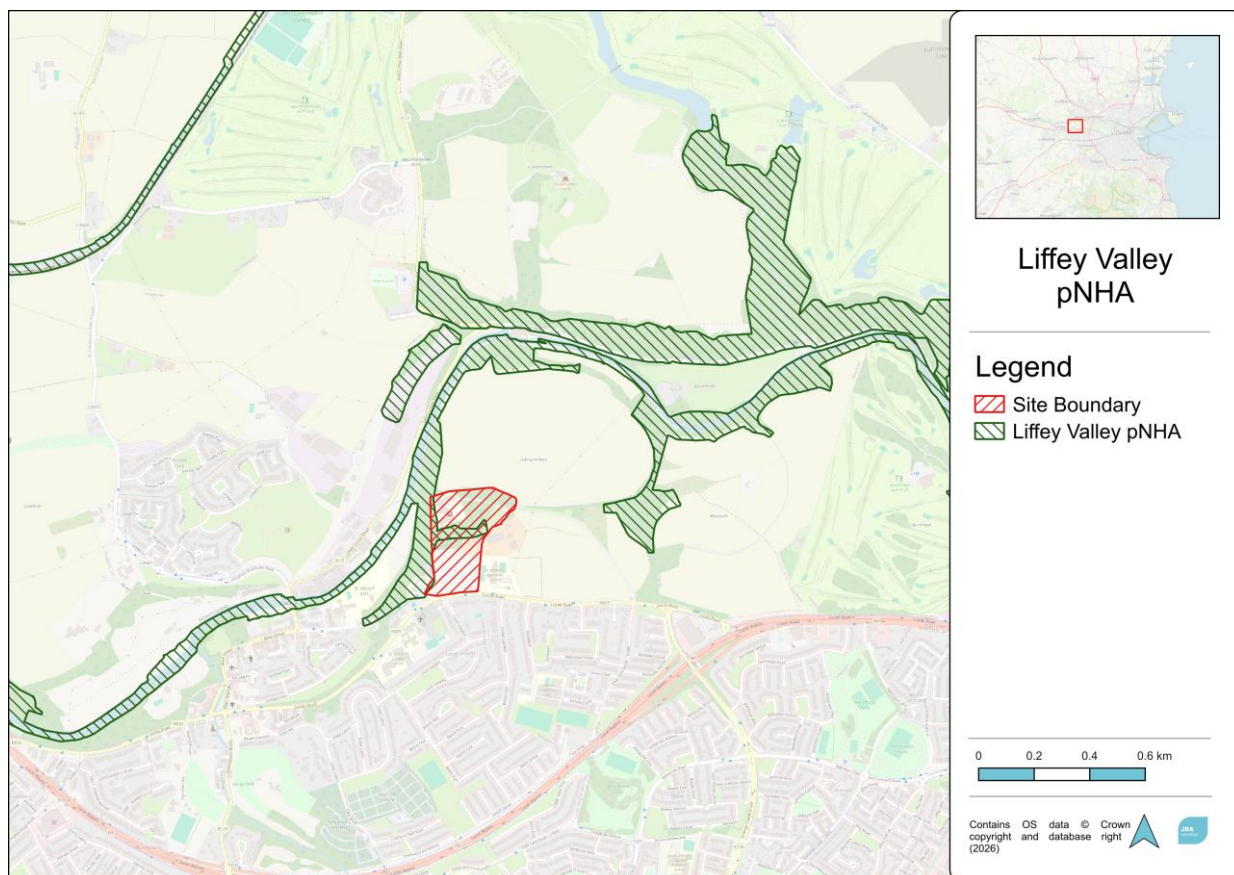


Figure 1-5 Liffey Valley pNHA Location Map

“NCBH4: Proposed Natural Heritage Areas: Referral to NPWS and other relevant prescribed bodies. Source: National legislation and APAS;

NCBH4 Objective 1: To ensure that any proposal for development within or adjacent to a proposed Natural Heritage Area (pNHA) is designed and sited to minimise its impact on the biodiversity, ecological, geological and landscape value of the pNHA particularly plant and animal species listed under the Wildlife Acts and the Habitats and Birds Directive including their habitats;

NCBH4 Objective 2: To restrict development within or adjacent to a proposed Natural Heritage Area to development that is directly related to the area’s amenity potential subject to the protection and enhancement of natural heritage and visual amenities including biodiversity and landscapes. Such developments will be required to submit an Ecological Impact Assessment prepared by a suitably qualified professional”.

An Environmental Impact Assessment Screening Report (EIAR) prepared by EGIS Engineering has been submitted as a part of the Planning Application. The EIA Report ensures the proposed development’s impact on the receiving environment is as minimal as possible, outlining appropriate mitigation measures where necessary.

“**Policy NCBH5:** Protection of Habitats and Species Outside of Designated Areas: Protect and promote the conservation of biodiversity outside of designated areas and ensure that species and habitats that are protected under the Wildlife Acts 1976 to 2018, the Birds Directive 1979 and the Habitats Directive 1992, the Flora (Protection) Order 2015, and wildlife corridors are adequately protected;

NCBH5 Objective 1: To ensure that development does not have a significant adverse impact on biodiversity, including known rare and threatened species, and that biodiversity enhancement measures are included in all development proposals;

NCBH5 Objective 2: To ensure that an Ecological Impact Assessment is undertaken for developments proposed in areas that support, or have the potential to support, protected species or features of biodiversity importance, and that appropriate avoidance and mitigation measures are incorporated into all development proposals”

The EIAR has assessed the native species on site this and is submitted with this application. As a part of the Planning Application, an Arboricultural Impact Assessment Report has been prepared by Arbor Care Arborist and Tree Consultant, and the Commission is invited to refer to this document.

There are seven sites within the Development Plan designated as proposed Natural Heritage Areas, among which is the Liffey Valley. It is an objection of the Plan to utilise local planning powers to minimise the risk of degradation in these areas. There are a number of objectives ensuring this, these are listed as follows.

“Policy GI2: Biodiversity: Strengthen the existing Green Infrastructure (GI) network and ensure all new developments contribute towards GI, in order to protect and enhance biodiversity across the County as part of South Dublin County Council’s commitment to the National Biodiversity Action Plan 2021-2025 and the South Dublin County Council Biodiversity Action Plan, 2020-2026, the National Planning Framework (NPF) and the Eastern and Midlands Region Spatial and Economic Strategy (RSES);

GI2 Objective 1: To reduce fragmentation and enhance South Dublin County’s GI network by strengthening ecological links between urban areas, Natura 2000 sites, proposed Natural Heritage Areas, parks and open spaces and the wider regional network by connecting all new developments into the wider GI Network;

GI2 Objective 2: To protect and enhance the biodiversity and ecological value of the existing GI network by protecting where feasible (and mitigating where removal is unavoidable) existing ecological features including tree stands, woodlands, hedgerows and watercourses in all new developments as an essential part of the design and construction process; such proactive approach to include provision to inspect development sites post construction to ensure hedgerow coverage has been protected as per the plan;

GI2 Objective 3: To retrospectively repair habitat fragmentation and provide for regeneration of flora and fauna where weaknesses are identified in the network through the implementation of new GI interventions;

GI2 Objective 4: To integrate GI, and include areas to be managed for biodiversity, as an essential component of all new developments in accordance with the requirements set out in Chapter 12: Implementation and Monitoring and the policies and objectives of this chapter;

GI2 Objective 5: To protect and enhance the County's hedgerow network, in particular hedgerows that form townland, parish and barony boundaries recognising their historic and cultural importance in addition to their ecological importance and increase hedgerow coverage using locally native species including a commitment for no net loss of hedgerows on any development site and to take a proactive approach to protection and enforcement;

GI2 Objective 6: To continue to support and expand the County Pollinator Plan through the management and monitoring of the County's pollinator protection sites as part of the Council's commitment to the provisions of the National Pollinator Plan 2021-2025;

GI2 Objective 7: To enhance the biodiversity value of publicly owned hard infrastructure areas by incorporating the planting of new trees, grasses and other species, thereby integrating this infrastructure into the overall GI network;

GI2 Objective 8: To take all possible steps to mitigate the impacts on biodiversity of increased recreation within the GI network, bearing in mind the effects of scramblers, dogs, drones, littering and illegal dumping;

GI2 Objective 9: To examine where appropriate the full potential of landfill sites and quarries as well as existing underutilised perimeter and border park spaces through the augmentation of wild grasses and other naturally occurring vegetation that enhance local area biodiversity and habitats in support of the National Pollinator Plan and to consider wildflower meadows where beneficial to biodiversity;

GI2 Objective 10: To enhance biodiversity and the health of pollinator species by banning the use of glyphosate in or close to public parks, public playgrounds, community gardens / allotments and within residential estates, whether by directly employed Local Authority staff or private contractors."

It is an underpinning objective of the Development Plan to ensure the protection of natural heritage within the county.

1.10.3.4 Strategic Corridor: Liffey Valley Corridor

The Liffey Valley is classed as Strategic Corridor 4: Liffey Valley Corridor in the Development Plan (please see Figure 1-5), the valley is described as the city's green lung and provides opportunities to strengthen the visual and landscape amenity of the county. It is an objective of the Plan to protect such amenity; this is summarised as follows.

"Strategic Corridor 4: Liffey Valley Corridor: The River Liffey traverses the northern boundary of the County and is a GI corridor of regional importance. It provides a 'green lung' for Dublin City / County and is a key element of the wider regional GI network, running from its origins in the Wicklow Mountains through the plains of County Kildare and through County Dublin into Dublin City Centre where it enters the sea;

Sections of the River Liffey are designated as proposed Natural Heritage Areas, while the portion within South Dublin County and Final County is also subject to a Special Amenity Area Order. These designations reflect the variety of habitats and protected species supported by the River Liffey; The majestic open parkland setting of sections of the River Liffey Valley provide opportunities to strengthen the visual and landscape amenity value of the valley and create appropriately designed pedestrian and cycle routes that can traverse the County and link with amenities in adjoining counties;

Overreaching Objectives: To protect and enhance the outstanding character and ecology of the Liffey Valley Corridor, recognising its value as a key regional landscape and GI feature that supports important habitats, species, and a range of ecosystem services;

- To protect and enhance the recreation and amenity value of the Liffey Valley Corridor, recognising its environmental sensitivities;
- To enhance connectivity with the surrounding regional GI network infrastructure;
- To facilitate and support the development of the Liffey Valley as an interconnected network of parklands and support the development of a carefully considered greenway

in collaboration with Dublin City Council, Fingal County Council, and Kildare County Council;

- To protect green and blue infrastructure within the River Liffey corridor based on the riparian corridors outlined in the Development Plan Green Infrastructure Map;
- To protect and enhance the outstanding landscape character and amenity of the Liffey Valley (see Appendix 9: South Dublin County Landscape Character Assessment, for landscape character details)".

The Development Plan identifies the St. Edmundsbury site as a core area within the Liffey Valley. In Section 4.3.2 the Plan addresses objectives for strategic corridors, this includes envisioned pathways for the development of the area which are listed below.

"Table 4.1 Strategic Green Infrastructure Corridors;

- To investigate the potential for enhanced connectivity between Lucan Demesne and St. Edmundsbury lands;
- **To investigate the potential for enhanced access to St. Edmundsbury lands from Lucan;**
- **To preserve and enhance existing woodlands and hedgerows at St. Edmundsbury". [Our Emphasis]**

The proposed development aims to retain the natural attributes of the site and implement mitigation measures where portions of the site will be altered to facilitate construction. This is further outlined within the accompanying Arboricultural Report prepared by Arbor Care Arborist and Tree Consultant and Landscape Masterplan and Report prepared by Dermot Foley Landscape Architects.

1.10.3.5 Liffey River Valley and Special Amenity Order

Under the Special Amenity Order, the Liffey Valley is protected for its landscape, visual, recreational, ecological, geological, and built heritage values.

It is an objective of the Plan to increase the permeability of the St. Edmundsbury Site, by facilitating and promoting increased connections and access to the subject lands. The proposed development aims to achieve the Council's aspirations regarding St. Edmundsbury laid out in the Plan, to increase connections with the Lucan area and the grounds of St Edmundsbury.

"Section 3.3.4 Liffey River Valley and Special Amenity Order: A Special Amenity Area Order (SAAO) was made for the Liffey Valley by Dublin County Council in 1990 and now straddles the administrative boundaries of South Dublin County Council and Fingal County Council. The extent of the area covered by the SAAO is from Lucan Bridge to Chapelizod; the area within the County is identified on the County Development Plan Land-Use Zoning maps that accompany this written statement;

Policy NCBH7: Liffey River Valley and Special Amenity Area Order Protect and enhance the special amenity value of the Liffey Valley, including its landscape, visual, recreational, ecological, geological, and built heritage value, as a key element of the County's Green Infrastructure network and implement the provisions of the Liffey Valley Special Amenity Area Order (SAAO);

NCBH7 Objective 3: To improve and extend the Liffey Valley Special Amenity Area Order along the Liffey Valley area in South Dublin from the border with Dublin City administrative area to Kildare County and promote its tourism potential subject to the protection of its biodiversity and ecological value;

NCBH7 Objective 4: To facilitate and support the development of the Liffey Valley (Zoning Objective 'HA-LV') as an interconnected green space and park in collaboration with Dublin City Council, Fingal County Council, Kildare County Council;

the OPW and other State agencies, existing landowners, community groups and sectoral and commercial interests in accordance with the Ministerial Order for the Liffey Valley SAAO by:

- Carrying out a study of the lands that comprise Liffey Valley inclusive of the Special Amenity Area Order (SAAO) and adjacent lands;

- Investigating and determining, as part of the study, viable and appropriate uses to support and facilitate the development of a Regional Park (Liffey Valley Park), with particular emphasis on enhancing the recreation, amenity value and accessibility of the area while protecting the valley's biodiversity and enhancing the green infrastructure network;
- Identifying and designating, as part of the study, possible future new pedestrian routes and footbridge locations in accordance with 'Towards a Liffey Valley Park' (2007) or any superseding plan, including potential permissive access routes.

Universal accessibility for all should be balanced with ensuring that environmental and built heritage sensitivities are not negatively impacted upon;

NCBH7 Objective 5: To ensure that development proposals within the Liffey Valley, including local and regional networks of walking and cycling routes;

- Avoid impacts on the Valley's sensitive landscape character and ecological network;
- Maximise opportunities for enhancement of existing features;
- Protect and incorporate natural and built heritage features as part of the County's Green Infrastructure network;
- Do not prejudice the future creation and development of interconnected public parklands;

NCBH7 Objective 6: To actively pursue the extension of publicly owned lands, either by direct purchase or land swap within and adjacent to the Liffey Valley Special Amenity Area to create a linked series of park land and open spaces;

NCBH7 Objective 7: To work in collaboration with the owners of lands along the length of the river to seek to provide appropriate public access".

The proposed development includes adequate provision to increase public accessibility to the St Edmundsbury grounds. It is an underpinning value of the proposed development to ensure the surrounding environment is protected and enhanced. The St Edmundsbury grounds is a key aspect of the River Liffey Valley, and the redevelopment of the site has been mindful of such.

1.10.3.6 South Dublin County Development Plan 2022-2028; Relevant Policies

The South Dublin County Development Plan 2022-2028 contains several policies that relate to the development of the wider Lucan area and the St Edmundsbury site, these are discussed in further detail below.

The subject site is within the Masterplan NCBH7 SLO 2, the Plan provides the provision for the future development of the Mental Health Facility on site. It is an objective of the Plan to ensure the expansion of the hospital can be achieved while ensuring the preservation of and proper regard to the surrounding environment and existing character.

"NCBH7 SLO 2: To work in collaboration with the owners of St Patrick's Hospital lands at St Edmundsbury, Lucan in the preparation of a Masterplan to examine the potential for the future provision of mental health services and accommodation on the existing hospital campus lands. The Masterplan will have full regard to the setting and integrity of the Protected Structures on the lands, the highly sensitive environmental characteristics of the site in relation to the Liffey Valley and Green Infrastructure principles and the need to provide appropriate public access including an area of accessible public realm within the lands and connectivity to adjacent lands to further the overall objective of developing a Liffey Valley public park". **[Our Emphasis]**

The Development Plan states it is an objective of South Dublin County Council to facilitate the development of the St Edmundsbury site. The Council has provided the scope to assess and work together with the owners of St Edmundsbury to expand the existing hospital facility on site.

It is an objective of the Council to ensure that adequate public access is provided to the St Edmundsbury site. Planning Objective EDE20 SLO1 outlines the following.

**“EDE20 SLO 1: To work in collaboration with the owners of lands at St. Edmundsbury, Lucan to seek to provide appropriate public access to these lands in the Liffey Valley”.
[Our Emphasis]**

The proposed development includes plans to ensure increased connections where appropriate between the St Edmundsbury Site and the Lucan area. This is further outlined in the accompanying Design Statement prepared by TOT Architecture as well as the Landscape Masterplan and Report prepared by Dermot Foley Landscape Architects and submitted with this application.

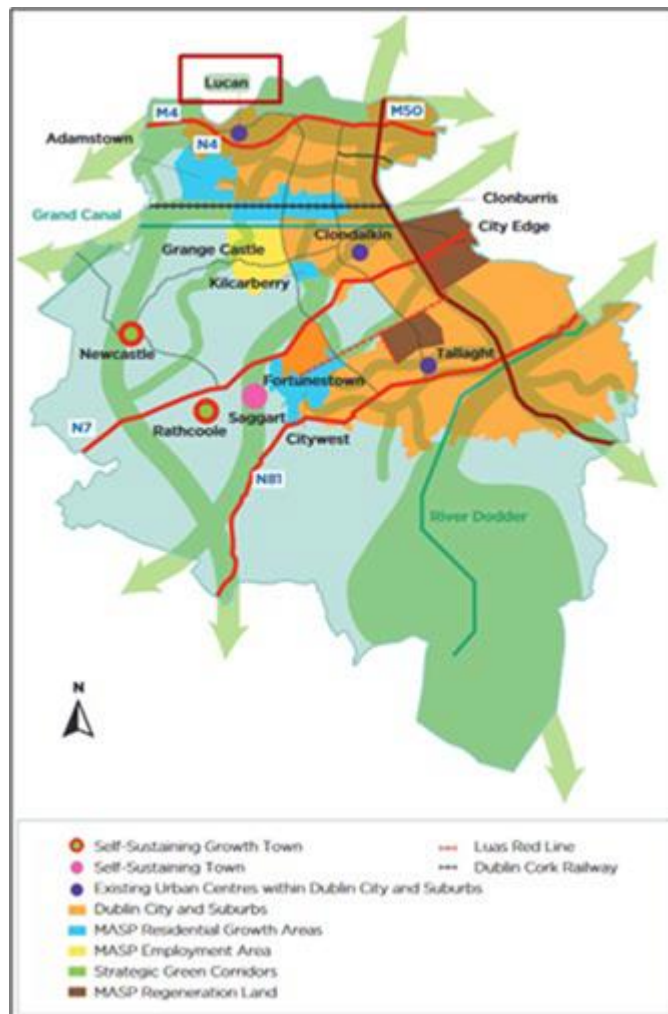


Figure 1-6 South Dublin County Core Strategy Map 2022-2028

The County follows an urban hierarchy with Lucan forming one of the larger centres. It is key to ensure the continued delivery of essential services and developments that boost economic activity to drive growth in the urban environment. The Development Plan addresses expected growth targets for the settlements of Lucan, Adamstown, and Palmerstown as one area. In Table 11 of the Core Strategy, it is stated that the area's population is expected to increase from 59,000 people in 2016 to c. 68,483 in 2028. There is a 21% increase, as the area grows there is a need to increase the availability of essential services and employment in the greater Dublin area.

In Figure 10 of the Core Strategy of the South Dublin County Development Plan, Lucan is identified to be an 'Existing Urban Centre within Dublin City and Suburbs' (Figure 1-6).

“Dublin City and Suburbs: international business core with a highly concentrated and diversified employment base and higher order retail, arts, culture, and leisure offer. Acts

as national transport hub with strong inter and intra-regional connections and an extensive commuter catchment". [Our Emphasis]

Lucan is considered to be a level 3 district centre, well connected with high-frequency bus routes, the Dublin-Kildare rail line services, and is located c. 14 km to the west of Dublin City.

In the Development Plan, the town is considered to be an employment hub for the surrounding lower density suburban neighbourhoods. There are future proposals to extend the Luas line to Lucan from Dublin City and to implement an upgrade to the Kildare line involving electrification and high-frequency commuter services.

"SM3 Objective 2: To facilitate and secure the implementation of major public transport projects as identified within the NTA's Transport Strategy for the Greater Dublin Area (2016-2035) as updated to 2042, or any superseding document, including BusConnects, **the DART expansion programme along the Kildare route, the opening of the new rail station at Kishogue and the Luas to Lucan;**

SM3 Objective 16: To support a review of bus corridors in the N4 environs to expand into the commuter belt towns of bordering County Kildare with a view to meeting future demand of the surrounding Lucan and Adamstown area;

Table 7.4 Park and Ride Proposals: (N4 Bus Corridor) Availability of site for the provision of park and ride to be investigated including potential for Park and Ride at location on N4 immediately adjacent exit 4A and subject to this location being acceptable to the NTA;

SM3 Objective 19: To promote the delivery of the Luas to Lucan and facilitate the reservation of any identified or emerging route". **[Our Emphasis]**

The planned expansion of the Luas to Lucan will further increase connectivity to Lucan and promote economic growth.

It is our opinion that the proposed development achieves a number of aspirations outlined in the South Dublin County Development Plan 2022-2028. The development of the St Edmundsbury site is identified as an opportunity to enhance connections between the Lucan area and the River Liffey Valley, improving the area's green network and utilising the amenity of the River Liffey Valley to its full potential. The development of the St Edmundsbury site is outlined in planning objectives EDE20 SLO 1 and NCBH7 SLO 2. The Council has taken into consideration the possibility of the hospital expansion and is prepared to work in conjunction with the owners to ensure the site is developed to benefit the wider Lucan area through their own development plan policy support.

1.11 Planning History

There are a number of historical planning applications within the general vicinity of the proposed development shown in Chapter 13 Cumulative Impacts (Figure 13-1 and

Table 13-1). These are further examined in Chapter 13 including details relating to nature of the planning applications.

2 Description of Proposed Development

2.1 Need for the Proposed Development

The Governors of Saint Patrick's Hospital (SPMHS) are the largest independent provider of mental health care in Ireland and comprises of two campuses: St. Patrick's University Hospital, James' Street, Dublin 8 and St. Edmundsbury Hospital, Lucan, Co. Dublin. In addition, SPMHS operate several community-based services by way of Dean Clinics located across the country. St. Patrick's University Hospital has been based in inner-city Dublin since its foundation in 1746 with money bequeathed by Jonathan Swift following his death in 1745. Since its inception, SPMHS have sought to provide the highest quality of mental health care to the people of Ireland.

SPMHS facilitates for more than 3,000 in-patient admissions per year, over 15,000-day care group therapy sessions per year, in addition to approximately 15,000 community-based individual treatment and care sessions in the Dean Community Mental Healthcare Clinics. SPMHS provides services for a wide range of mental illnesses and mental health difficulties including Addictions & Dual Diagnoses, Anxiety Disorders, Bipolar and other Mood Disorders, Eating Disorders, Depression and Psychoses. It also provides specialist services centred on Young Adults, Adolescents and Older Adults. Many services are now delivered through Technology-Mediated Interventions (TMI) where services are delivered remotely to people in their own homes on an individual and group basis.

Currently, the Board and Management are working to consolidate St. Patrick's Mental Health Services into a national centre of excellence for mental health care, research, and education. As part of the Organizations commitment in continuing to honour Swifts' vision, they now wish to redevelop their physical infrastructure for the continued benefit of future generations. This next phase in the evolution of SPMHS will consolidate and enhance their capability to provide the highest quality of care to more people, while greatly improving the physical environment and experience for future service users.

The proposed development is identified as a Specific Local Objective (SLO) in the SDCC Development Plan:

NCBH7 SLO2: To work in collaboration with the owners of St Patricks Hospital lands at St Edmundsbury, Lucan in the preparation of a Masterplan to examine the potential for the future provision of mental health services and accommodation on the existing hospital campus lands. The Masterplan will have full regard to the setting and integrity of the Protected Structures on the lands, the highly sensitive environmental characteristics of the site in relation to the Liffey Valley and Green Infrastructure principles and the need to provide appropriate public access including an area of accessible public realm within the lands and connectivity to adjacent lands to further the overall objective of developing a Liffey Valley public park.

The need for additional mental health facilities is also described in unpublished report by HSE on the 'Acute Bed Capacity'²

"Nationally there are 2,630 mental health approved centre beds across public and private centres. This represents a rate of 55.2 per 100,000. Of these, 1,912 are beds in public approved centres, a rate of 40.2 per 100,000 (23.8 per 100,000 acute beds and 16.3 per 100,000 continuing care beds). Considering just acute beds, in both public and private approved centres as per the recommendation of 50 per 100k laid out by the Oireachtas Joint Committee on the Future of Mental Health, there is a current shortfall of 832 beds nationally."

Whilst the proposed development at St Edmundsbury comprises relocation of beds from the St. Patrick's University Hospital, Dublin 8 campus and does not provide additional bed numbers, it will consolidate St. Patrick's Mental Health Services into a national centre of excellence for mental health care, research, and education.

² HSE Acute Bed Capacity- Report of the Specialist Group, (June 2020) *Sharing The Vision - A Mental Health Policy for Everyone*. Unpublished

2.1.1 Vision

Since 2017, TOT Architects have worked closely with the Board and Management of St. Patrick's Mental Health Services to aid in the realization of a national centre of excellence for mental health care, research, and education. This vision, as outlined below, is set within a strict requirement to maintain the level of services that currently operate at a minimum 96% In-Patient capacity on any given day. This is in addition to Day Services & TMI sessions.

Vision Outline

- Creation of an Exemplar National Mental Health Facility;
- Change Public Perception of Mental Health Issues and Service Provision;
- Provide a Robust Campus Wide Plan, Allowing for Maximum Flexibility with Adopted Designs;
- Creation of a Sense of Arrival & Individuality for Service User & Visitor;
- Enhancement of Patient Dignity and Experience;
- Upgrade & Consolidation of In-Patient Facilities;
- Upgrade & Consolidation of Day Service Facilities;
- Efficient Cross-Over of In-Patient, Day Service & TMI Packages;
- Creation of a Safe & Secure Environment for All;
- Creation of a More Radically Open Environment; and
- Future Proof New Facilities in Anticipation of Tighter Regulatory Requirements.

2.1.2 SPMHS Development Plan

2.1.2.1 James' Street Campus

The James' Street Campus dates from 1757 and currently operates a total of 255 In-patient bed spaces in tandem with the many out-patient clinical & group sessions that also overlap with In-patient services. This is coupled with extensive research, training, and educational departments. Inpatient services are spread across eight wards, some of which are still located within the original George Semple 1757 historic core. As the Campus has developed over the centuries, the standard of accommodation varies significantly in age, size and provision ranging from:

- Single bedroom with shared sanitary provision;
- Shared dormitory with shared sanitary provision; and
- Single bedroom with ensuite provision.

The campus can be divided into 3 distinct groupings namely: Adult In-Patient, Adolescent In-Patient, and Day Care Services. Supporting these departments are the many important services including Nursing, Clinical, Education, Sports, Catering, Administration, Human Resources, Housekeeping, Grounds + Garden Maintenance, and various Technical Services. The departments are spread around the campus in a diverse manner with little or no physical connections in some instances. Development of the campus has occurred on a needs basis with the result that growth has been 'ad-hoc' with little consideration given to coherent development of the site. With an ever-increasing demand for mental health service provision, this has added increased pressure on the existing facility and capacity to operate in a more flexible manner, as the hospital responds to changing needs. Heretofore, the hospital has managed to utilize space within existing buildings coupled with significant expenditure in upgrade of older building stock. Where SPMHS is to realize its vision as it progresses into the 21st Century, a significant reorganization of existing infrastructure and accommodation standards shall be required.

2.1.2.2 Saint Edmundsbury Campus

Built by Edmund Sexton Pery (1719-1806) the St Edmundsbury Estate House and a significant portion of associated lands were acquired by SPMHS in 1898. The first in-patients were admitted in March of 1899, initially comprising of convalescing female in-patients from St James' Street. The surrounding site comprised of a working farm with walled gardens that serviced the hospital's needs. Sadly, the original farm and gardens have fallen into disrepair along with the dispersal of parts of the original land holdings.

Currently, St Edmundsbury is home to a 52 Bed In-Patient Facility (built 1985) linked to the Historic Building. The Historic Building is also home to Inpatient and Staff facilities in addition to accommodating a dedicated Day Service Unit. Since the outbreak of Covid 19, the 52 bed In-patient facility has served as a dedicated Covid Isolation Ward for the Dublin 8 Campus. A standalone Dean Clinic, located at the main entrance to the site, completes the community services provision on site.

2.2 Alternatives Considered

2.2.1 Do-Nothing

The do-nothing option would see SPMHS continue in their existing facilities, with no development or changes taking place.

This is not an option for the future viability of SPMHS, particularly as an In-patient Service Provider. Their existing real estate, comprising in the main of old and outdated buildings are nearing end of life and no longer provide the requisite efficiencies or built environment for mental health service provision. Where the option to do nothing is pursued, the goals set out by SPMHS vision will not be achieved and the ability to maintain provision of services in the long term will become increasingly diminished.

As the do-nothing option is not a viable option for SPMHS, it is not considered further in this report.

2.2.2 Dublin 8 Redevelopment

Since 2017, TOT Architects have worked closely with the Board and Management of St. Patrick's Mental Health Services to put in place a comprehensive Development Control Plan (DCP) for their Dublin 8 Campus (St. Patrick's University Hospital, James' Street, Dublin). This is comprised of nine (9) Main Development Phases complete with decanting, demolition, and construction subphases.

In order to maintain the existing provision of services on site, a continuous building program in excess of fifteen (15) years would be required to complete the redevelopment of the campus. This is primarily due to maintaining existing operations and the associated safety and logistical challenges in achieving same. While SPMHS have applied for and obtained Grants of Permission for the initial phases of the proposed DCP, it has become increasingly apparent that funding a rebuilding program of such magnitude and complexity, is proving cost prohibitive without a significant down scaling in provision of their current services over a several year period. This is also set against a marked increase in demand for quality mental health provision within the State. This realization has led to a renewed focus on the SPMHS folio and how best to achieve their stated vision in a more viable manner.

Under the Proposed Development Control Plan, SPMHS have applied for Planning Permission to Dublin City for the following:

- Phase 1: Relocation of Existing & Enhancement of Day & In-Patient Clinical Services. Grant of Permission: Ref - 3609/17;
- Phase 2: Construction of a new Special Care Unit and General Adult Wards complete with new Clinical Hub. Grant of Permission: Ref - 3760/17;
- Phase 3: Construction of In-Patient Extension to Existing Adolescent Unit and Establishment of a National Hub for Mentally Healthy Living. Grant of Permission: Ref - 2881/19; and
- Phase 4: The maintenance and upgrade works, to the original historic building (Protected Structure) Grant of Permission: Ref - 3387/22.

Stemming from the above, SPMHS are currently reviewing redevelopment options for their Dublin 8 campus with a clear commitment to maintaining a permanent presence within its Historic Core. This has led to a renewed focus and further detailed analysis of their Lucan facility and how this may become a more viable option for the continuance of SPMHS operations. Such a move would entail relocating the majority of existing services that are currently provided in Dublin 8, to a purpose built, state of the art facility in St Edmundsbury. It is further reasoned that the proposed development is eminently viable from a timing and capital expenditure perspective. The

development can be completed as a single phase, within a circa. thirty (30) month construction program.

2.3 Proposed Development

2.3.1 Overview

The proposal as outlined here is to create a world-class Adult and Adolescent Inpatient mental health facility complete with Daycare, Dean Clinic Services, Research, Educational and Advocacy programs on the site of St Edmundsbury Hospital. These will compliment retained services in Dublin 8. Paramount to this will be the enhancement of service user dignity, experience and the breaking down of public misconceptions surrounding mental health issues.

In achieving this, it is recognized that Saint Edmundsbury holds no less challenges than exist in Dublin 8, in particular, integration of such a facility within the 'Natural, Cultural and Built Heritage-Liffey River Valley and Special Amenity Order' zoning (South Dublin County Council Development Plan 2022 – 2028). Best Evidence Based Clinical Design recognizes that a greater connection to, and integration of biophilia, set within a positive sense of place, contributes significantly to the wellbeing and positive experiences of mental health service users. On first visit to St Edmundsbury, it was clear these qualities permeate throughout the site, if having somewhat fallen into neglect.

2.3.2 Existing Site

St Edmundsbury Hospital (C. 8.10 ha) is accessed off the R835 Lucan Road at two locations that also form a long - established public right of way 'walking loop' around the inner edges of the site. The Existing Hospital facility is located to the northwest corner of the site, set within secluded wood lands. Access to the hospital buildings is via the loop road. The public are not encouraged to detour into and around the immediate facility. The southern portion of the site comprises of an overgrown and derelict farmyard and partly demolished walled garden. Both elements are associated with the original estate and are not accessible to the public. The derelict building areas have also become a home for antisocial activity adjacent to the hospital site.

The adjoining lands comprise of the following:

- North: Arable Farm and Mature Wood Lands;
- South: Lucan Road (R385) with predominant residential housing fronting onto south side;
- East: Arable Farmlands, Semi Derelict Farmyard and St Andrew's National School; and
- West: Mature Wood Lands, ESB Step Down Station and 'The Village' Montessori Pre-School.

2.3.3 Proposed Key Site Interventions

- Retain public walking loop and enhance public interaction / experience;
- Increased woodland and site wide planting;
- Refurbishment and repurposing of historic farm building(s) into proposed new hospital facility;
- Creation of a public Café in the historic barn interface with walking loop;
- Repurposing of the historic walled garden into proposed new 200-bedroom in-patient adult hospital facility with surrounding gardens;
- Demolition of existing 52 bed adult in-patient facility (currently connected to St Edmundsbury House) and construction of a new standalone: 14 bed in-patient adolescent unit on same site;
- Refurbishment and repair of St Edmundsbury House as may be required from undoing of contemporary alterations;
- Creation of a welcoming and open interface between SPMHS and its surroundings;
- Creation of feature landscaping and natural screening and associated hospital carparking provision; and
- Widening of site entrance located at existing Dean Clinic Service.

2.4 Outline of Proposed Development

The proposed development will consist of:

- Demolition of existing modern extension to St Edmundsbury House, currently in use as a 52-bed adult facility;
- Construction of new 14-bed adolescent facility on the site of the modern extension to St Edmundsbury House, consisting of:
 - Secure Adolescent Care Unit, catering for a wide range of psychiatric treatment programs for both in-patient and day service users comparable to Main Hospital, with dedicated gymnasium.
- Construction of new 200-bed in-patient adult facility to the south of the existing woodland consisting of:
 - Specialist Age Care Unit, High Dependency Unit, Eating Disorder Unit, Higher Acuity General Psychiatric Unit, Occupational Therapy Hub.
 - Hospital Admissions, Education and Training, Restaurant, Shop, Hairdresser, Multi Faith, Library, Pharmacy,
 - Housekeeping, Kitchen and Facilities Management.
 - 3 no. General Psychiatric Unit, Hospital SMT.
- Soft landscaping including:
 - Public Open Space maintaining the existing walking loop and access to the future Liffey Valley Park.
 - Open garden (green lunges connecting the new hospital and the existing buildings, accessible by service users and staff only),
 - Private gardens (secure garden directly accessible from the new hospital by service users and staff only),
 - Private Courtyards (secure private green spaces within the ward areas),
 - Green roofs on the new 200-bed facility.
- Reconfigured and additional new car and cycle parking facilities (with revised total of 214 no. car parking spaces, 2 no. bus parking spaces and 160 no. secure cycle parking spaces;
- Retention, refurbishment and repurposing of existing historic farm buildings into Individual Therapy Consultation Suites, a Public Café, and Hospital Facilities Buildings;
- Hard landscaping including all footpaths, internal roadways, courtyards, and boundary treatments;
- Continued use of St Edmundsbury House for Adult Daycare/Group and Individual Therapy sessions in addition to associated consultant, administration and support facilities.
- Refurbishment of existing kitchen facilities serving both Adolescent Unit and Staff.
- Removal of contemporary interfaces at St Edmundsbury House, and repair/reinstatement of historic façade.
- All ancillary features.

The proposed development is shown in Figure 1.2.

3 Population and Human Health

3.1 Introduction

This chapter describes the likely impacts of the proposed development on the human environment including the potential effects on human health and disruptions to the population of Lucan and the surrounding area. This chapter primarily addresses the potential effects of the proposed scheme on human health, demographics, receptors such as schools and existing community facilities, recreation and tourism. Other chapters of the EIAR, such as Chapter 8 on the construction impacts with regard to noise and air quality, are closely linked to effects on population and human health. All of these chapters should be read to gain a full understanding of the impacts on human health.

3.2 Assessment Methodology

This chapter has been prepared having regard to the EIA Directive 2014/52/EU and the associated Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022), as well as the Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment, August 2018. It is noted that Article 3 of the 2014 Directive effectively defines the EIA process as identifying, describing, and assessing in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on a series of specified environmental factors. The first of these is “population and human health” which replaces “human beings” in the 2011 Directive. The term “human health” is not defined in the 2014 Directive.

Consideration of human health effects resulting from the construction and operation of a project should focus on health issues arising in the context of the other environmental factors listed in Article 3 of the Directive/ Section 171A of the Act, namely:

- Population;
- Biodiversity, with particular attention to protected species and habitats;
- Land, soil, water, air and climate;
- Material assets, cultural heritage and the landscape; and
- Interaction between the above factors.

European Commission guidance relating to the implementation of the 2014 Directive, in reference to “human health” states *“Human health is a very broad factor that would be highly Project dependent. The notion of human health should be considered in the context of other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study. In addition, these would concern the commissioning, operation, and decommissioning of a Project in relation to workers on the Project and surrounding population”*.

A desktop study will be carried out to establish the baseline associated with economic activity, employment opportunities, settlement and social patterns. Noise and dust generation during construction will be assessed in air and noise chapter, positive impacts and improved quality of life due to the scheme will be discussed in the EIAR.

The proposed development site (C. 7.03Ha) is located within the Lucan Heights Electoral District, an area of 22.3 km² / 5,521.1 acres / 8.6 square miles. Baseline information with respect to the demographic and employment characteristics of the resident population within the catchment area was sourced from the 2022 Censuses from the Central Statistics Office. The data included information on population, structure, age profile, and household size, number of persons at work and unemployment profile. Information was also sourced from the South Dublin County Development Plan 2022-2028 Written Statement.

3.3 Receiving Environment

St Patrick's Mental Health Services provides two main in-patient facilities in Dublin: St Patrick's University Hospital on Steeven's Lane (Dublin 8) and St Patrick's Hospital Lucan (St

Edmundsbury) in County Dublin. They also provide community-based care through the Dean Clinics, one of which is also located in St Patrick's Hospital Lucan (St Edmundsbury). The facility at St Edmundsbury has 52 beds for in-patient services, and additional out-patient space. The facility caters mainly for people who reside outside Dublin City, with out-patient surveys showing nearly 85% travel from County Dublin and the rest of the country.

Lucan is within the suburbs of Dublin City, located on the busy N4 corridor. Lucan is regarded as one of the critical areas for delivering services, retail, and economic activity in the suburb areas. According to the SDCC CDP 2022-2028, the population of the Lucan/Adamstown/Palmerstown area is anticipated to grow by 16%, to over 68,000 by 2028.

The proposed development is located within the land boundaries of St Edmundsbury Hospital, located north-east of Lucan Co. Dublin. The south border of the site runs by the Lucan Road (R835) and the site is approximately 60m east of the River Liffey (Liffey_180). The north boundary of the site is adjacent to a greenfield of agricultural land. St Andrew's National School and some farmhouse buildings border the south- east and east of the site boundary, the Village Montessori Pre-School borders the south-west of the site.

3.3.1 Immediate Vicinity

The immediate environs of St. Edmundsbury, the Woodville area to the east, and the Woodlands area to the north are all agricultural lands. The Hermitage Golf Club is 1.7km to the east of St Edmundsbury and the Golf Course at Luttrellstown Castle Resort is 2km to the northeast. The River Liffey forms the immediate northern border of the site, and the Lucan Road (R835) forms the southern boundary. The urban centres of Lucan and Pettycannon and Ballydowd form the western and southern boundary areas.

The site itself is split into two distinct areas, divided by a woodland of the Liffey Valley proposed Natural Heritage Area (pNHA) which extends along the western boundary. According to the SDCC CDP 2022-2028 the land use zoning describes the site use as 'To protect and enhance the outstanding character and amenity of the Liffey Valley' and 'All development classes shall not be permitted within 30m of the riverbank, in order to protect recreational amenity', doctors' buildings are permitted in existing premises.

3.3.2 The Wider Area

Lucan is situated on the banks of the Griffeen and Liffey Rivers in a scenic part of the Liffey Valley and adjoins the Liffey Valley Special Amenity Area Order (SAAO). Lucan largely dates from the eighteenth century when the town became a fashionable resort, following the discovery of a sulphuric spa in 1758. A series of mills, including linen, woollen and flour mills, was established on the Liffey downstream from Lucan during the eighteenth and nineteenth centuries and several mill complexes survive in varying degrees of preservation.

Palmerstown is 5km to the east along the N4 in west county Dublin. A large part of Lucan Village is covered by the National Monuments Service (NMS) 'Sites and Monuments Record Zone (SMR)'. There are approximately 28 Sites and Monuments Records and 168 National Inventory of Architectural Heritage within 1.5km of the site. South Dublin County has grown around the villages of Clondalkin, Lucan, Newcastle, Palmerstown, Rathcoole, Rathfarnham, Saggart, Tallaght and Templeogue.

Lucan is situated 14 kilometres to the west of Dublin City along the N4 economic corridor. It is characterised by a historic village core surrounded by generally low-density suburban neighbourhoods based around a polycentric network of local retail centres and a level 3 district centre.

The area is served by high frequency bus routes to Dublin City. The Dublin to Kildare rail line serves communities, including Adamstown, to the south of Lucan. Employment is provided for locally through mixed use retail and commercial areas adjacent to the village core. Grange Castle and other business parks provide employment to the south. The GDA Transport Strategy proposes a Luas line to Lucan from Dublin City and upgrading of the Kildare line as far as Hazelhatch involving electrification and high-frequency commuter services.

3.3.3 Demographics

The smallest geographical units distinguished by the Central Statistics Office (CSO) are Electoral Districts (EDs) and Small Areas (SAPS).

Table 3-1 outlines the population change between 2016 and 2022 in the State, in Dublin and South County Dublin. This Table demonstrates the population increases are consistent across all regions, in particular a higher rate of increase recorded in Dublin and South Dublin area. Given the location of the proposed development, the SAPS are used to determine the localised catchment within 2km of the proposed development site, compiling statistic information from Central statistics Office census data³.

Table 3-1 Population Trends within the intercensal period 2016-2022

District	2016	2022	Change from 2011-2016 (%)
State	4,761,865	5,149,139	+8.1
Dublin (All)	1,173,179	1,450,01	+7.7
South Dublin	278,767	301,868	+8.0

On the Census Interactive Map 2022 the proposed development site is labelled as A267101018/A267102004 (Small Areas Map), where the 2022 population comprises 168 persons, a decrease of 35 from 2016.

3.3.4 Households

Table 3-2 below outlines the average household size in each of the geographical areas assessed. The statistics illustrate an increase in household size from 2016 to 2022, for the State and South Dublin County Council area, as follows:

Table 3-2 Household size during the intercensal period 2016-2022

State	2016	2022
Dublin (All)	2.75	2.74
South Dublin	2.99	2.97

(Data source: CSO website www.cso.ie)

Recent trends in employment were evaluated using CSO information from the 2016 and 2022 Censuses and Small Area Population statistics. The information was compiled on the basis that:

- The labour force is defined as the sum of people aged 15 years and over who are at work or who are employed.
- The participation rate is the proportion of persons in the labour force aged 15 years and over expressed as a percentage of all persons in that age group.

Statistics shown in Table 3-3 below outlines the employment figures for the State and South Dublin. Table 3-3 below and Table 3-4 over leaf illustrate the employment figures and distribution of employment for the Lucan area.

Table 3-3 Employment Figures for the State and South Dublin

Area	Total Persons At Work		Unemployed (ex 1st time job seekers)		% Rates of Participation in Labour Force	
Year	2016	2022	2016	2022	2016	2022
State	2,006,641	2,300,00	297,396	127,000	61.3	64.9
South Dublin	119,210	137,111	16,235	10,841	42.7	45.5

³ <https://www.cso.ie/en/statistics/population/censusofpopulation2022/censusofpopulation2022profile1-populationdistributionandmovements/>

Table 3-4 Employment Figures for Lucan Heights (Persons 15 Years and Over)

Town	Unemployed (ex. first time job seekers)		At Work	
	2016	2022	2016	2022
Lucan Heights	148	141	2187	2167

This indicates that, the number at work in the Lucan Heights ED decreased during the intercensal period, the national trend increased, the number of unemployed decreased, this was in line with the national trend with the number of people unemployed in the State and in South Dublin.

Table 3-5 Distribution of employment by broad industrial group in Lucan ED and the SAPs area (Number of persons aged 15 and over) for 2022

Industry	Lucan Heights	Small Area
Managers, Directors and Senior Officials	204	6
Professional Occupations	538	36
Associate Professional and Technical Occupations	362	17
Administrative and Secretarial Occupations	301	6
Skilled Trades Occupations	209	5
Caring, Leisure and Other Service Occupations	146	4
Sales and Customer Service Occupations	144	7
Process, Plant and Machine Operatives	101	5
Elementary Occupations	166	5
Not stated	146	0
Total	2,317	91

The majority of employment in the Small Area in 2022 is professional occupations grouping, in addition to the majority of employment is Lucan Heights ED as a whole.

3.3.5 Principal Potential Receptors

An assessment of the principal potential receptors within the environs of the proposed development including homes, schools, tourism, agriculture and commercial and industrial premises was conducted in detail below.

3.3.5.1 Homes

According to the most recent 2022 census Lucan Heights ED contains approx. 1,921 dwellings and a further 1,918 units within Rathcoole.

Looking at the wider area of Adamstown, Palmerstown and Lucan using the ED of Lucan St. Helens, Lucan Eskler, Clondalkin-Cappaghmore, Clondalkin-Rowlagh, Clondalkin-Moorfield, Palmerstown West and Lucan heights There are approximately 23,171 units of house/bungalow and flat/apartments within approximately 4km of the proposed development site.

The site provides a 183m buffer between the industrial building and the nearest single private residence to the south (and a 150m buffer between the perimeter 3m high planted earth berm and the same private residence).

3.3.5.2 Schools and Colleges

There are approximately 6 schools within a 1.2km distance of the proposed development.

Table 3-6 Educational Facilities in the Area

School Type	Name	Address
Primary	St. Andrews National School	Lucan
Primary	Scoil Mhuire Girls' National School	Lucan
Post Primary	St. Joseph's College	Lucan
Post Primary	Coláiste Phádraig	Lucan
Primary	St. Mary's Boys National School	Lucan

There is one school (St. Andrews National School) located to the immediate east of the proposed development.

3.3.5.3 Childcare Facilities

There are two pre-schools, one in the immediate area of the proposed development, The Village Montessori, located, to the west of the site off Chapel Hill and a second, Learning for Life approximately 1km away off Lucan-Newlands Road.

3.3.5.4 Health, Social and Community Facilities

Local Facilities within 1.5km include; Lucan Lodge Nursing Home, Ardeevin Drive, Lucan Centre Retreat, Primrose Lane, Lucan Youth-reach, Life Centre, Lucan-Newlands Rd, Esker Lawns Medical Centre, 49a Esker Lawns. Churches in the area include St. Mary's Church, Lucan Rd, approximately 100m southwest of the proposed development.

3.3.5.5 Other

There is a golf club approximately 1.15km to the east of the proposed development, The Hermitage Golf Club in Ballydowd, several agricultural fields separate the site from the golf course, along the Lucan Road.

3.4 Potential Effects

The impacts of the proposed development on human beings are discussed in terms of the construction phase and operational phase.

3.4.1 Construction Phase

The potential construction phase impacts on local residences and businesses associated with the proposed development will relate mainly to traffic, noise, water quality, air emissions and visual impacts, all of which are outlined in Chapters 5, 6, 7, 8, 9, 10, and 11 of this EIAR.

3.4.1.1 Impacts on Economic Activity

No economic activity will be displaced through the construction phase of the proposed development. During construction, trucks and vans will be delivering materials to the site on a daily basis and the employment of construction workers on-site is expected to boost local economic activity. Their personal and business-related expenditures on retail, leisure, and accommodation services are anticipated to positively impact to local businesses.

The impact on economic activity during construction will be **Temporary, Imperceptible, Positive**.

3.4.1.2 Impacts on Human Health and Safety

There will be potential risks to the health and safety of construction personnel on-site due to the use of large, mobile machinery and heavy equipment and materials. Health and safety procedures will be put in place as part of the Construction Management Plan and the Construction Traffic Management Plan with the appointed contractor to ensure the safety of construction staff. The Construction Traffic Management Plan will also consider the proximity and interaction of pedestrians and school traffic to the site entrance in particular St. Andrew's National School on Lucan Road. Additionally, the building footprints within the site of proposed development site will be securely fenced off from the public during the construction phase. It is considered that with

construction traffic management measures in place that there will be no significant off-site health and safety risks.

The impact on human health and safety during construction will be **Temporary, Imperceptible, Adverse**.

3.4.1.3 Impacts on Residential, Recreational Amenities and Community Facilities

The construction phase of the development will impact on residential amenity in the locality; it will be a temporary, minor impact, and, as set out in Chapters 7, 8, and 9 of this EIAR, the environmental impact will be within accepted limits. A local Communication Plan will be implemented to address local concerns as part of the Construction Traffic Management Plan with the appointed contractor. Pedestrian access through the site along the vehicular track will be maintained albeit separated from construction vehicular traffic to allow for continuation of the existing looped walk within St Edmundsbury grounds. The construction of the proposed development will not affect the tourism profile of the area.

The impact on residential, recreational amenities and community facilities during construction will be **Temporary, Imperceptible, Adverse**.

3.4.2 Operation Phase

Once operational, **Permanent, Imperceptible, Positive** impacts will result from the operation of the proposed development for population and human health in the local area and within the Greater Dublin Area; this section is further discussed in the Material Assets chapter.

3.4.3 Do Nothing Scenario

The do-nothing option would see SPMHS continue in their existing facilities, with no development or changes taking place.

This is not an option for the future viability of SPMHS, particularly as an In-patient Service Provider. Their existing real estate, comprising in the main of old and outdated buildings are nearing end of life and no longer provide the requisite efficiencies or built environment for mental health service provision. Where the option to do nothing is pursued, the goals set out by SPMHS vision will not be achieved and the ability to maintain provision of services in the long term will become increasingly diminished.

As the do-nothing option is not a viable option for SPMHS, it is not considered further in this chapter.

3.5 Mitigation Measures

3.5.1 Construction Phase

The design of the proposed development will be subject to safety design reviews to ensure that all requirements of the project are safe. A Project Supervisor for the Design Process (PSDS) will be appointed as part of this process.

The following measures are proposed during the construction phase to mitigate impacts on Population and Human Health:

- A comprehensive Health and Safety Programme will be put in place on the site prior to commencement of construction to minimise any risks to site personnel and visitors. The requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013) will be complied with at all times.
- A Construction Traffic Management Plan will be developed and agreed with South Dublin County Council prior to undertaking any construction works.
- During pre-construction and construction phases safety will be managed in accordance with the Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013). A Project Supervisor Construction Stage (PSCS) will be appointed as part of the proposed project;
- A Construction Waste Management Plan will be produced by the appointed contractor to mitigate impacts on the surrounding roads. Safety will be a primary concern during the construction phase of the proposed development. A contractor safety management

program will be implemented identifying potential hazards associated with the proposed work including a permit to work system;

- Temporary contractor facilities and areas under construction will be enclosed and fenced off from the public with adequate warning signs of the risks associated with entry to these facilities. The temporary facilities are shown and described in the Construction Environment Management Plan (CEMP). Entry to these areas will be restricted and will be kept secure when construction is not taking place;
- Measures to ensure public safety with respect to air quality and dust, and noise and vibration, are detailed in Chapter 7 and 8, and
- Measures to ensure public safety with respect to construction traffic, are detailed in Chapter 9.

3.5.2 Operation Phase

The operation of the proposed development will be carried out in strict accordance with all Irish and European Regulations governing safety in the workplace and in particular the regulations implemented under the Safety, Health and Welfare at Work Act, 2005 and its subsequent amendments.

All relevant facility employees will be fully trained in the operating procedures for equipment and processes, with particular emphasis on related health and safety issues.

All mitigation measures outlined in the respective chapters of this EIAR will be implemented in full to ensure the potential impact is minimised in relation to traffic, noise and vibration, air quality and water.

3.6 Residual Impacts

The proposed development will generate a range of short-term construction phase impacts and long-term operational phase outcomes for the local population and human health.

During construction, temporary effects on the residential population, healthcare facilities, education institutions, and amenity spaces are anticipated, primarily relating to noise, dust, visual change, and construction traffic. These will be effectively managed and reduced to acceptable levels through the CEMP, traffic management measures, and site-specific safeguards. Consequently, residual impacts during construction are expected to be **Temporary, Imperceptible, Adverse**.

In the operational phase, the scheme will contribute significantly to local and national mental health services, including inpatient and outpatient facilities, while ensuring a high-quality public realm. This will deliver **Permanent, Imperceptible, Positive** effects for the local population. Operational impacts on healthcare and education facilities are considered Not Significant, given the availability and capacity of existing provision. Open space and amenity will be kept through the retention of walking routes and green spaces.

3.7 Interactions

Impacts to population and human health have the potential to interact with the following environmental factors:

- Material Assets discussed in Chapter 9: Impacts to material assets, in particular to utilities or roads, traffic, and transport, could lead to interactions with population and human health if significant or allowed to go on for a long time. This is unlikely to occur given the nature of the proposed works and likely short length of disruptions to utilities. Impacts on population and human health due to material assets impacts are likely to be **Temporary, Slight, Adverse**.
- Air quality, Noise and Vibration discussed in Chapters 7 and 8: Excessive noise or vibration during construction can cause disturbance to human health to residents the surrounding area. Mitigation measures outlined in the Construction Impacts chapter will ensure that the impact of noise and vibration on population and human health will be **Temporary, Not Significant, Adverse**.

3.8 Potential Cumulative Effects

Several developments are proposed or under construction in the area of the proposed development, as outlined in Chapter 13 Cumulative Impacts. If the construction periods of these developments are to overlap, there is a potential to impact on population and human health through disruptions in Lucan and to residential and community facilities along the Lucan Road (R835). These effects will be Temporary while the construction phase progresses and will not be significant.

Once operational, the proposed mental health facility, when considered cumulatively with the above developments, will have a Positive impact on population and human health.

4 Biodiversity

4.1 Introduction

This chapter assesses the impact of the proposed St Edmundsbury Hospital development expansion project (hereafter referred to as 'the proposed development') on biodiversity during the construction and operation phases.

This chapter provides an overview of the assessment and field methodologies; receiving ecological environment; a description of the nature and scale of any potential significant direct or indirect impacts; and any necessary mitigation and biodiversity enhancement measures recommended as part of this EIAR.

The design of the proposed development has evolved through comprehensive design iteration, with particular emphasis on minimising the potential for ecological impacts, where practicable, whilst ensuring the objectives of the proposed development are attained. In addition, feedback received from the comprehensive consultation programme undertaken throughout the design development process has been incorporated, where appropriate.

It is strongly recommended that this Biodiversity Chapter be read in conjunction with the below chapters and their respective appendices, which provide further detail on related impacts and the proposed mitigation measures for topics discussed within this chapter:

- Chapter 5 - Land and Soil;
- Chapter 6 - Water;
- Chapter 7 - Air and Climate;
- Chapter 8 - Noise and Vibration;
- Chapter 9 - Material Assets;
- Chapter 10 - Cultural Heritage: Archaeology and Architectural Heritage; and
- Chapter 11 - Landscape and Visual Amenity.

4.2 Methodology

4.2.1 Study Area

The study area of the proposed development was defined by the findings of the desk study, site surveys for presence/absence of protected habitats, flora or fauna within the Zone of Influence (Zoi) and best practice methodology referenced above for assessing effects on those ecological features. In general, surveys were conducted for each of the key ecological receptors (KERs) within specific geographical areas; and focussed on assessing potential impacts within the Zoi of the proposed development.

4.2.2 Relevant Guidelines, Policy and Legislation

The biodiversity assessment included a comprehensive policy, plan and strategy review of the following documents:

- The Planning & Development Act 2000 & the Planning and Development (Amendment) Act, 2010 (as amended) hereafter referred to as the Planning Acts;
- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive);
- Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Birds Directive);
- Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 as amended by Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 on the assessment of the effects of certain public and private projects on the environment;
- European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) (as amended);

- EU Water Framework Directive (2000/60/EC) and European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003);
- OPR Practice Note PN02 Environmental Impact Assessment Screening (OPR, 2021);
- Guidelines for planning authorities and An Bord Pleanála on carrying out environmental impact assessment (Department of Housing, Planning and Local Governments, August 2018);
- Guidelines on the information to be contained in Environmental Impact Assessment Reports Environmental Protection Agency (EPA, 2022);
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009);
- Wildlife Acts (and amendments) 1976 to 2023;
- Flora (Protection) Order, 2022 (S.I. No. 235 of 2022);
- Inland Fisheries Acts 1959 to 2017;
- National Biodiversity Plan 2023-2030, Department of Housing, Local Government and Heritage (DHLGH) 2024;
- South Dublin County Council Biodiversity Action Plan 2020-2026;
- Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes, NRA 2006;
- Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes, NRA 2006;
- Guidelines for the Treatment of Bats during the Construction of National Road Schemes, NRA 2006;
- Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub prior to, during and post Construction of National Road Schemes, NRA 2006;
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (EU 2013);
- Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, (CIEEM, 2018);
- Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition) (Collins (ed.), Bat Conservation Trust 2024;
- Bat Mitigation Guidelines for Ireland (Marnell et al., 2022);
- Guidance Note 08/123. Bats And Artificial Lighting At Night - Institute of Lighting Professionals and Bat Conservation Trust (ILP & BCT, 2023);
- The Bat Workers' Manual, 3rd Edition (Mitchell-Jones and McLeish), Joint Nature Conservation Committee 2004;
- Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (2008), NRA 2008;
- Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads, NRA 2010;
- The Management of Invasive Alien Plant Species on National Roads – Standard (GE-ENV-01104), TII 2020;
- The Management of Invasive Alien Plant Species on National Roads – Technical Guidance (GE-ENV- 01105), TII 2020; and
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters, IFI 2016.

4.2.3 Data Collection & Collation

This ecological assessment is based on a combination of desk-based research and a number of ecological field surveys targeting select groups of protected fauna likely to be impacted by the construction and operation of the proposed scheme. The desk-based research includes a data search for protected and notable species using the National Biodiversity Data Centre (NBDC)

Mapping System (NBDC, 2026). A customised polygon was produced to extract all the species data from the set ZOI for this proposed development.

4.2.3.1 Data Sources

Reviewed data sources included relevant published biodiversity data; collation of existing information on the ecological environment; and consultation with relevant statutory bodies. Accessed data sources include:

- The Status of EU Protected Habitats and Species in Ireland Volume 1: Summary Overview, NPWS 2019;
- The Status of EU Protected Habitats and Species in Ireland Volume 2: Habitats Assessment, NPWS 2019;
- The Status of EU Protected Habitats and Species in Ireland Volume 3: Species Assessment, NPWS 2019;
- EPA Online databases on water quality and WFD maps;
- Aerial photography available from www.osi.ie and Google Maps;
- National Biodiversity Data Centre - Species Distribution Maps;
- NBDC All Ireland Red Data lists for vascular flora, mammals, butterflies, non-marine molluscs, dragonflies & damselflies, amphibians, and fish;
- International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species;
- Online data available on Natura 2000 network of sites and on Natural Heritage Areas (NHAs) or proposed Natural Heritage Areas (pNHAs) as held by the National Parks and Wildlife Service (NPWS);
- Habitat and species GIS datasets provided by the NPWS;
- Bat records from Bat Conservation Ireland's (BCI) database;
- Environmental Impact Statements for any developments located within the locality of the site;
- Environmental information/data for the area available from the EPA website;
- Records from the Botanical Society of Britain & Ireland (BSBI); and
- Any additional existing environmental or ecological reports examining the local areas.
-

The following organisations, amongst others as necessary, with relevance to biodiversity have had their respective data:

- National Parks and Wildlife Service;
- Inland Fisheries Ireland;
- Bat Conservation Ireland;
- BirdWatch Ireland (BWI);
- Botanical Society of Britain & Ireland; and
- Other members of the public with local knowledge/ records (e.g. relating to bat roosts).

4.2.4 Field Surveys

The initial ecological site walkover, including habitat mapping and species-specific surveys, was conducted on the 01/02/2023 by JBA Consulting Ecologists to inform the ecological baseline of the site.

Aerial photographs and site maps assisted the habitat survey. Habitats have been named and described following A Guide to Habitats in Ireland by Fossitt (2000). Identification for higher plants principally follows that given in Webb's An Irish Flora (Parnell and Curtis, 2012); while contemporary nomenclature is in line with The New Flora of the British Isles 4th Edition (Stace, 2019).

The survey methods were in general accordance with those outlined in the following documents:

- Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009)

- Best Practice Guidance for habitat Survey and Mapping. The Heritage Council. (Smith et al., 2011)
- Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition) (Collins, 2024)

Additional species-specific surveys were also conducted on-site on the following dates as outlined in Table 4-1 below.

Table 4-1: Ecological surveys and survey dates

Ecological Survey / Consultant	Survey Dates
Habitats (Fossitt) & Invasive Species / JBA	01/02/2023; 05/07/2023; 29/09/2023; 13/06/2025; and 08/08/2025
Rare & Protected Flora / JBA	05/07/2023; 17/07/2025; and 08/08/2025
Non-volant Mammals / JBA	01/02/2023; 05/07/2023 and 17/06/2025
Preliminary Bat Roost Assessment / G&A*	22/09/2022
Bat Emergence Activity Surveys / G&A	22/09/2022; 07/07/2023; 27/07/2023; and 06/09/2023
Breeding Bird Surveys / JBA	21/04/2023; 08/05/2023; 12/06/2023; 06/06/2025; 13/06/2025; and 17/06/2025 (Static deployment 06/06/2025 - 11/06/2025)
Breeding Bird Nest-Count Survey (Farm Courtyard Buildings) / JBA	29/09/2023 and 08/08/2025

* G&A: Gannon and Associates

Habitat & Invasive Species Surveys

All habitats located within the survey area of the proposed development were mapped to level three of the Heritage Council's Fossitt (2000) habitat codes, and in accordance with Best Practice Guidance for Habitat Survey and Mapping (Smith et al., 2011). Floral species present that were either representative of a habitat or considered to be of conservation interest were recorded. The habitat's extent was mapped onto an aerial photograph within the QField GIS Android application, with GPS points taken where any ecological features of note were observed. Any non-native invasive plant species listed on the Third Schedule of the Birds and Habitats Regulations were also recorded during the habitat surveys. Identification for higher plants principally follows that given in Webb's - An Irish Flora (Parnell and Curtis, 2012); while contemporary nomenclature is in line with The New Flora of the British Isles 4th Edition (Stace, 2019).

Rare & Protected Flora

Given the potential presence of a number of rare or protected flora (Flora Protection Order, 2022), targeted flora surveys were conducted to record any notable flora which is associated with the Liffey Valley pNHA. Identification for higher plants principally follows that given in Webb's - An Irish Flora (Parnell and Curtis, 2012); while contemporary nomenclature is in line with The New Flora of the British Isles 4th Edition (Stace, 2019).

Non-volant Mammals

As recent data, including records from the NBDC place Badger *Meles meles*; Pine Marten *Martes martes*; and Hedgehog *Erinaceus europaeus* within the surrounding vicinity of the proposed development they must be considered within the scope of the EIAR Biodiversity Chapter. The non-volant mammal surveys examined the suitable areas within the footprint of the proposed development for field signs of the above including scat/ droppings, setts/ dens and any mammal tracks.

The surveys involved a one-day survey by ecologists to cover the extent of the proposed development, as well as a 50m disturbance buffer for the site. Field signs were recorded and later mapped and photographed within the QField GIS Android application. Surveying techniques were in line with those outlined in the Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes (2006); and Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (2006).

Bats - Preliminary Roost and Emergence Surveys

Please see Gannon & Associates Bat Report in Appendix X.X for details on the methodologies for these bat surveys.

Breeding Bird Surveys

Breeding bird surveys were conducted across three visits during April, May and June 2023, with a further three surveys conducted in June 2025 (including a deployment of static recorder, which recorded bird song for 5 consecutive days at dawn and dusk periods). All suitable breeding bird habitat located within approx. 50m of the proposed development were slowly walked in a manner allowing the ecological surveyors to come within 20m of all suitable habitats. Birds were identified by sight and song, and general location and activity were recorded within the QField GIS Android application. Conservation status of the bird species were later recorded as per:

- Birds of Conservation Concern in Ireland (BoCCI) lists which classify bird species into three categories: Red List – birds of high conservation concern; Amber List – birds of medium conservation concern; and Green List – birds not considered threatened (Gilbert et al., 2021);
- Bird species listed on the Annex of the EU Birds Directive (2009/147/EC); and
- SCI species of SPAs within the Zol of the proposed project.

Surveying techniques were in line with those outlined in the Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (2009) / Common Bird Census (CBC) methodology.

4.2.5 Zone of Influence

The Zol for the project is based on a judgement of the likely extent of the ecological impacts on key ecological receptors. This will vary for different ecological features, depending on their sensitivities to environmental change.

In relation to terrestrial habitats, impacts will be limited to the lands within the site boundary of the proposed development, as well as the immediate surrounding environs (e.g. overshadowing and soil; root compaction, dust settlement and changes to local hydrological regimes).

Hydrological connections (e.g. drainage ditches) are often the most far-reaching impacts due to their lotic or semi-lotic nature. It becomes increasingly difficult to precisely predict the likely significance of adverse water-borne pollutants as they travel downstream from the pollution point source, given potential dilution and retention factors along the course of the impacted watercourse. Under the precautionary principle any designated sites (Natura 2000 and proposed NHA sites), protected habitats or species (flora and fauna) located downstream of the local watercourses, namely the other sections of the Liffey Valley pNHA, will be considered to be within the hydrological Zol of this proposed development.

Regarding the groundwater-to-surface water impact pathway, the characteristics of the proposed site's underlying aquifers mean that surface water pollution that manages to seep into aquifers below the site, is likely to discharge to the nearby watercourses, i.e. the drainage ditch (connected to the River Liffey) to the north-east of the site; and the River Liffey itself located 60m west of the site (GSI, 2026). Therefore, the groundwater-to-surface water Zol will be set to 300m, with the addition of downstream surface water hydrological connections.

In respect to Zol for air pollution (emissions and dust), designated sites within a 250m buffer zone of the development sites, i.e. the Grand Canal pNHA, were considered as per the Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2024), including ex-situ foraging habitats utilised by protected species associated with local designated sites.

In relation to physical (vibration and clearance works); audible and visual disturbance, faunal species will be considered on a species-by-species basis. Generally, smaller mammal species (e.g., Pygmy Shrew) will be given 100m disturbance zones, which is reflective of their relatively small territories. For larger mammals, such as Badger, a 150m disturbance zone can be established in the scenario where there is an active sett.

The Zol for local bat species is centred around lighting impacts within and adjacent to footprint of the development sites, as well as the developments' proximity of known bat roosts within the locality. Impacts are likely to occur within a 3km radius sustenance zone around each of these known bat roosts.

The Zol for bird species is generally linked with direct habitat loss within the footprint of the proposed development sites. Additional adverse impacts for these birds will likely arise from the disturbance from construction works, which can extend 500m (Cutts et al, 2013).

The Zol for amphibians is linked with direct habitat loss and degradation, as well as construction and operational disturbances. As the furthest impact pathway that can affect terrestrial and drainage ditch habitats is 300m (plus the addition of downstream drainage ditch habitat), this will be the Zol distance for amphibian species.

The Zol for freshwater fish and aquatic invertebrates is linked to the drainage ditch in the northwest corner of the site, that flows into the River Liffey and has the potential to be degraded as a result of the construction and operations of the proposed development site. Therefore, the Zol for these faunal species will mirror that of the surface water Zol, i.e. all surface waters downstream of the site's drainage ditch.

The Zol for terrestrial invertebrates is generally linked with direct habitat loss and degradation, as well as construction and operational disturbances. As the furthest impact pathway that can affect terrestrial habitats is 300m, this will also be the Zol distance for terrestrial invertebrate species.

4.3 Impact Assessment Methodology

4.3.1 General Approach

The KERs identified during the ecological walkover surveys and from desk-based assessments were reviewed. A summary of KERs to be examined within the impact assessment section is presented at the end of the baseline environment section to highlight the KERs that have been identified as being present within the Zol of the proposed development site.

4.3.2 Appropriate Assessment Process

The initial, screening stage of the Appropriate Assessment is to determine:

- Whether the proposed plan or project is directly connected with or necessary for the management of the European designated site for nature conservation.
- If it is likely to have a significant effect on the European designated site, either individually or in combination with other plans or projects.

For those sites where potential likely significant effects are identified, either alone or in combination with other plans or projects, further assessment is necessary to determine if the proposals will have an adverse impact on the integrity of a European designated Natura 2000 site, in view of the site's conservation objectives (i.e. the process proceeds to Stage 2).

A separate Stage 1 - Screening for Appropriate Assessment (AA) report has been produced (JBA, 2026), to assess the potential for likely significant effects on designated Natura 2000 sites. The Screening for Appropriate Assessment report concluded that adverse likely significant effects were not anticipated for Natura 2000 sites, including effects on ex-situ QI/SCI-supporting habitats outside the boundaries of the designated sites.

4.3.3 Valuation of Receptors

The value of designated sites, habitats and species populations is assessed with reference to:

- Their importance in terms of 'biodiversity conservation' value (which relates to the need to conserve representative areas of different habitats and the genetic diversity of species populations).
- Any social benefits that habitats and species deliver (e.g., relating to enjoyment of flora and fauna by the public).

The valuation of designated sites considers different levels of statutory and non-statutory protection. Assessment of habitat depends on several factors, including the size of the habitat, its conservation status and quality. The assessment also takes account of connected off-site habitat that has the potential to increase the value of the on-site habitat through association. Valuation of

species depends on a number of factors including distribution, status, rarity, vulnerability, and the population size present.

Table 4-2: Examples of criteria used to define the value of ecological features (NRA, 2009)

Level of Value	Examples of Criteria
International	- European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation; - Proposed Special Protection Area (pSPA); - Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended); - Features essential to maintaining the coherence of the Natura 2000 Network; - Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive; - Resident or regularly occurring populations (assessed to be important at the international level) of the following: > Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or > Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; - Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971); - World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972); - Biosphere Reserve (UNESCO Man & The Biosphere Programme); - Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979); - Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979); - Biogenetic Reserve under the Council of Europe; - European Diploma Site under the Council of Europe; and - Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).
National	- Site designated or proposed as a Natural Heritage Area (NHA / pNHA); - Statutory Nature Reserve; - Refuge for Fauna and Flora protected under the Wildlife Acts; - National Park; - Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park; - Resident or regularly occurring populations (assessed to be important at the national level) of the following: > Species protected under the Wildlife Acts; and/or > Species listed on the relevant Red Data list; - Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive.
County (Co. Dublin)	- Area of Special Amenity; - Area subject to a Tree Preservation Order; - Area of High Amenity, or equivalent, designated under the County Development Plan; - Resident or regularly occurring populations (assessed to be important at the County level) of the following: > Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; > Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; > Species protected under the Wildlife Acts; and/or > Species listed on the relevant Red Data list; - Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance; - County important populations of species, or viable areas of semi-natural habitats or

Level of Value	Examples of Criteria
	natural heritage features identified in the National or Local BAP, if this has been prepared; - Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county; and - Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.
Local (High)	- Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared; - Resident or regularly occurring populations (assessed to be important at the Local level) of the following: > Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; > Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; > Species protected under the Wildlife Acts; and/or > Species listed on the relevant Red Data list. - Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality; and - Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.
Local (Low)	- Sites containing small areas of semi-natural habitat that are of some local importance for wildlife; and - Sites or features containing non-native species that are of some importance in maintaining habitat links.
Less than local*	- Areas of heavily modified or managed vegetation of low species diversity or low value as habitat to species of nature conservation interest; and - Common and widespread species.
* Not included within the original NRA table. Level of value added to address features with less than 'Local' value	

Guidance published by CIEEM (2024) recommends breaking down the importance of ecological features in a geographic context similar to the NRA guidance shown in Table 4-2 with the following frame of reference to be adapted to local circumstances.

- International and European
- National
- Regional
- Metropolitan, County, vice-county or other local authority-wide area
- River Basin District
- Estuarine system/Coastal cell
- Local

The NRA (2009) guidance is congruent with this CIEEM (2024). The NRA (2008, rev. 2009) guidance on geographic criteria for ecological valuation, as described in Table 4-2 is utilised as the primary means of habitat valuation assessment in this chapter, as only the NRA guidance provides a split of High and Low level valued local ecological features, which provides more flexibility in regard to assessment of low-valued habitats that still provide ecological services (e.g. monoculture non-native ornamental shrubbery providing nesting opportunities to local breeding bird species).

4.3.4 Descriptive Terminology & Significance of Impacts

The EPA Guidelines (EPA, 2022) provide guidance on determining significance and type of ecological effects. The assessment of effects of the proposed development site on biodiversity are assessed in terms of quality (positive, neutral or negative effects), significance (imperceptible, not significant, slight, moderate, significant, very significant or profound effects), extent, context, probability (likely, unlikely effects) and duration (momentary, brief, temporary, short term, medium

term, long term, permanent or reversible effects) in line with the criteria set out in 'Description of Effects' table as it appears within the 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports'.

Additionally, the NRA (2009) and CIEEM (2018) guidelines were followed (in conjunction with the EIA guidelines), which requires examination of the following two key elements:

- Impact on the integrity of the ecological feature; and
- Impact on its conservation status within a given geographical area.

4.3.5 Ecological Integrity

Ecological integrity should be regarded as the coherence of ecological structure and function, across the entirety of a site that enables it to sustain all of the biodiversity or ecological resources for which it has been valued (NRA, 2009).

Ecological integrity is most often used when determining impact significance in relation to designated nature conservation areas (e.g. SACs, SPAs or pNHA/NHAs) but can often be the most appropriate method to use for non-designated areas of biodiversity value where the component habitats and/or species exist, with a defined ecosystem at a given geographic scale.

Any adverse impact on the integrity of an ecological site or ecosystem is considered to be significant if it moves the condition of the ecosystem away from a favourable condition: removing and/or changing the processes that support the sites' habitats and/or species; affects the nature, scale, structure, complexity and functioning of component habitats; and/or, affects the population size and viability of the inhabiting floral and faunal species therewithin.

4.3.6 Conservation Status

The definitions for conservation status given in the EU Habitats Directive 92/43/EEC, in relation to habitats and species, are also used in the CIEEM (2024) and NRA (2009) guidance:

- For natural habitats, conservation status means the sum of the influences acting on the natural habitat and its typical species, that may affect its long-term distribution, structure and functions as well as the long-term survival of its typical species, at the appropriate geographical scale.
- For species, conservation status means the sum of influences acting on the species concerned that may affect the long-term distribution and abundance of its populations, at the appropriate geographical scale.

An impact on the conservation status of a habitat or species is considered to be significant if it will result in a change in conservation status.

After the definitions provided in the EU Habitats Directive 92/43/EEC, the conservation status of a habitat is favourable when:

- Its natural range and areas it covers within that range are stable or increasing;
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and
- The conservation status of its typical species is favourable as defined below under species.

And the conservation status of a species is favourable when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

If it is determined that the ecological integrity and/or conservation status of a key ecological feature will be impacted on, then the level of significance of that impact is related to the geographical scale at which the impact will occur (i.e. local, county / regional, national, international). In some cases, an impact may not be significant at the geographic scale at which

the ecological feature has been valued (e.g. national) but may be significant at a lower geographical level (e.g. local).

4.3.7 Residual Impacts

The development is assessed for positive, neutral and negative residual impacts, which includes the evaluation of the proposed development's mitigation by design measures. This is carried out where mitigation is proven to be effective and will be implemented effectively with a high degree of certainty. Where significant residual impacts are still identified, further mitigation measures will be proposed as part of the EIA process to avoid, reduce or minimise them. Each impact assessment sub-section assigns a final significance level to the impact described, which considers and includes the implementation of any stated mitigation measures; these are the residual impacts.

4.3.8 Cumulative Impacts

Potential sources of cumulative and in-combination impacts were identified based on their potential impacts on KERs. Potential sources of cumulative impacts were sought within an area where there is the potential for a significant impact on a site or species. The plans and projects identified as potential cumulative impact sources are outlined in Chapter 13 of this EIAR.

4.3.9 Constraints & Limitations

This Biodiversity Chapter is based on ecological site surveys and existing desktop data from the sources outlined within previous sub-sections. The chapter necessarily relies on some assumptions and is inevitably subject to some limitations as detailed below. These do not affect the conclusion, but the following points are recorded in order to ensure the basis of the assessment is clear:

- Information on the works and conditions on site are based on current knowledge at the time of writing. Changes to the site since surveys were undertaken cannot be accounted for. However, the site surveys have followed CIEEM (2019) Advice note on the lifespan of ecological reports and surveys.
- Where field data and desktop data are limited, the precautionary principle is utilised when determining potential ecological sensitivities within the proposed schemes Zol.

4.4 Baseline Environment

This baseline environment section presents information gathered from existing reports and desk-based sources as detailed in sub-section 4.2.3 and a series of ecological site visits conducted on the dates listed in sub-section 4.2.4.

4.4.1 Designated Sites

This section lists the designated sites of international and national importance within the Zol of the proposed development. Table 4-3 below lists these designated sites with their respective direct and hydrological distances from the proposed site development.

Table 4-3: Site proximity and importance of designated sites within the Zol buffers

Site Name	Designation	Importance	Distance from site	Hydrological distance from site
North Dublin Bay	SAC	International	16.7km	21.2km
South Dublin Bay	SAC	International	15.0km	20.0km
North Bull Island	SPA	International	16.7km	21.2km
South Dublin Bay and River Tolka Estuary	SPA	International	13.6km	18.4km
North-West Irish Sea	SPA	International	19.0km	21.2km
Liffey Valley	pNHA	National	Within site	Within site
Dolphins, Dublin Docks	pNHA	National	16.0km	18.4km

Site Name	Designation	Importance	Distance from site	Hydrological distance from site
North Dublin Bay	pNHA	National	13.6km	19.5km
South Dublin Bay	pNHA	National	15.0km	20.0km

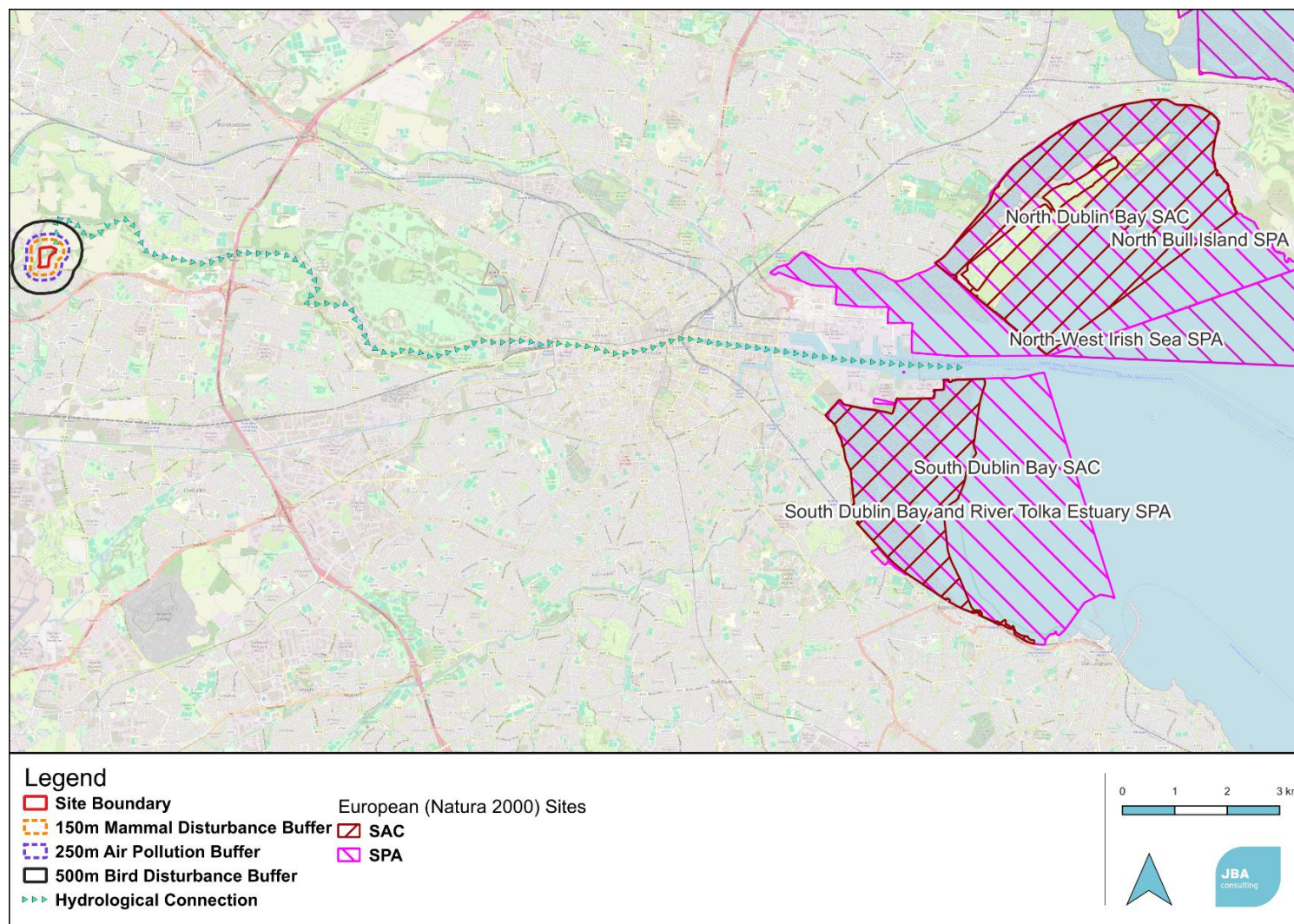


Figure 4-1: Natura 2000 sites within the Zol of the proposed development (OSM, 2026)

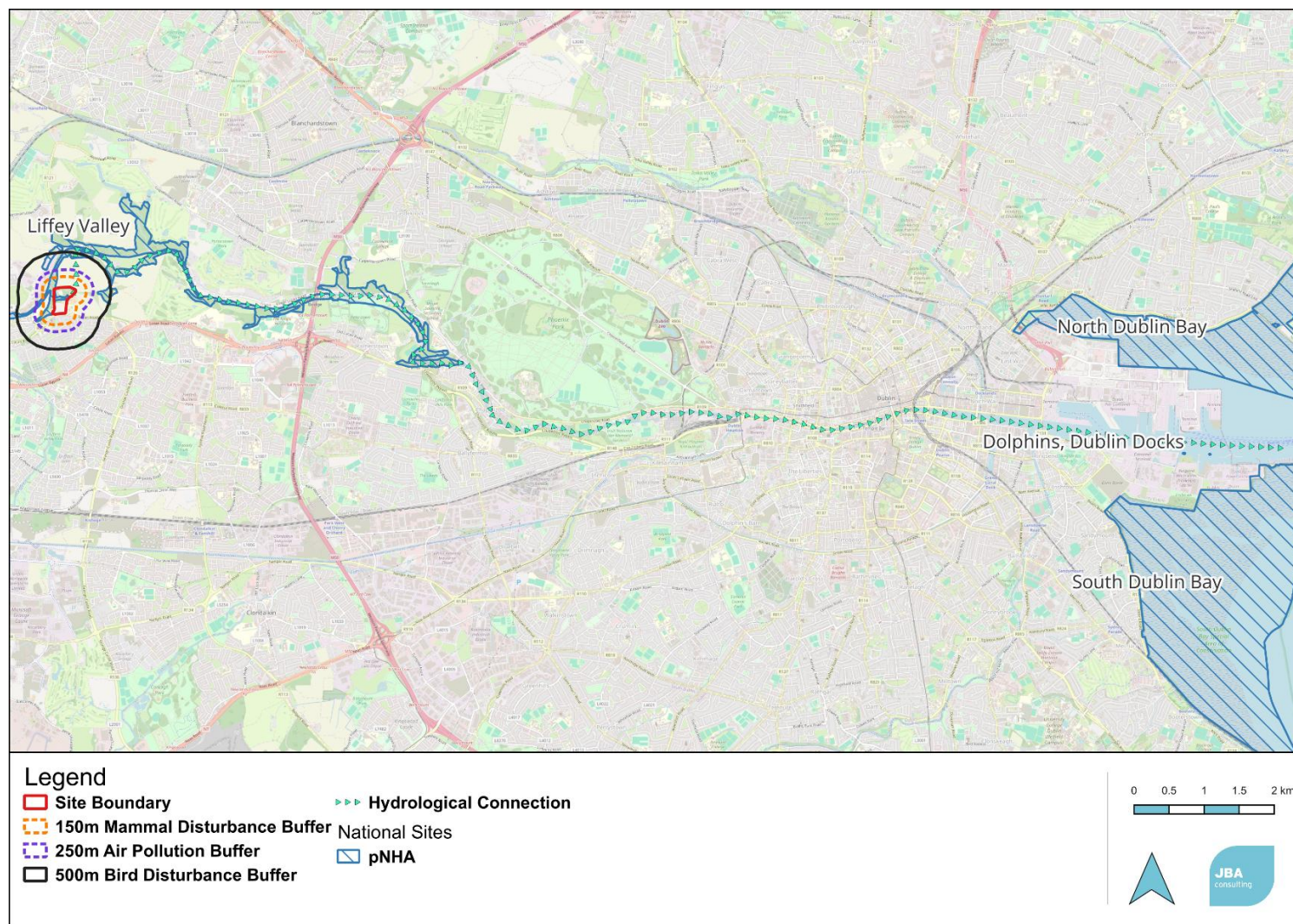


Figure 4-2: pNHA sites within the Zol of the proposed development (OSM, 2026)

Table 4-4: Site briefs; QIs / SCIs; and project-relevant threats and their impacts and sources to the Natura 2000 sites within the Zol

Site Name	Brief	KERs (QIs / SCIs)	Project-relevant Threats: Impact (Source)
North Dublin Bay SAC (000206)	The North Bull Island sand spit is a relatively recent depositional feature, formed as a result of improvements to Dublin Port during the 18th and 19th centuries. The seaward side of the island has a fine sandy beach. A substantial area of shallow marine water is included in the site. The interior of the island is excluded from the site as it has been converted to golf courses. Nature conservation is a main land use within the site. The North Bull Island dune system is one of the most important systems on the east coast and is one of the few in Ireland that is actively accreting. It possesses extensive and mostly good quality examples of embryonic, shifting marram and fixed dunes, as well as excellent examples of humid dune slacks. Both Atlantic and Mediterranean salt marshes are well represented, and a particularly good marsh zonation is shown. The salt marshes grade into mudflats and sandflats, some of which are dominated by annual <i>Salicornia</i> species. Petalwort <i>Petalophyllum ralfsii</i> occurs at its only known station away from the western seaboard (NPWS, 2013a).	- Mudflats and sandflats not covered by seawater at low tide [1140] - Annual vegetation of drift lines [1210] - <i>Salicornia</i> and other annuals colonising mud and sand [1310] - Atlantic salt meadows <i>Glauco-Puccinellietalia maritimae</i> [1330] - Mediterranean salt meadows <i>Juncetalia maritimi</i> [1410] - Embryonic shifting dunes [2110] - Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120] - Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] - Humid dune slacks [2190] - Petalwort <i>Petalophyllum ralfsii</i> [1395] (NPWS 2013b)	Urbanised areas, human habitation: High impact (outside) Discharges: High impact (inside) Diffuse pollution to surface waters due to other sources not listed: Medium impact (inside) (EEA, 2020a)
South Dublin Bay SAC (000210)	This intertidal site extends from the South Wall at Dublin Port to the West Pier at Dun Laoghaire, a distance of c. 5 km. Several permanent channels exist, the largest being Cockle Lake. A small sandy beach occurs at Merrion Gates, while some bedrock shore occurs near Dun Laoghaire. A number of small streams and drains flow into the site. The designated site possesses a fine and fairly extensive example of intertidal flats. Sediment type is predominantly sand, with muddy sands in the more sheltered areas. A typical macro-invertebrate faunal assemblage exists within the SAC. The SAC has the largest stand of Dwarf Eelgrass <i>Zostera nolti</i> on the east coast (NPWS, 2015a).	- Mudflats and sandflats not covered by seawater at low tide [1140] - Annual vegetation of drift lines [1210] - <i>Salicornia</i> and other annuals colonising mud and sand [1310] - Embryonic shifting dunes [2110] (NPWS 2013c)	Urbanised areas, human habitation: High impact (outside) Discharges: Medium impact (both) Marine water pollution: Medium impact (both) (EEA, 2020b)
North Bull Island SPA (004006)	The North Bull Island is among the top ten sites for wintering waterfowl in the country. It supports internationally important populations of Light-bellied Brent Goose and Bar-tailed Godwit and is the top site in the country for both of these	- Light-bellied Brent Goose <i>Branta bernicla hrota</i> [A046] - Shelduck <i>Tadorna tadorna</i> [A048] - Teal <i>Anas crecca</i> [A052] - Pintail <i>Anas acuta</i> [A054]	Continuous urbanisation: Medium impact (outside) Discharges:

Site Name	Brief	KERs (QIs / SCIs)	Project-relevant Threats: Impact (Source)
	species. A further 14 species have populations of national importance, with particular notable numbers of Shelduck, Pintail, Grey Plover, and Red Knot. The SPA is a regular site for passage waders such as Ruff, Curlew Sandpiper and Spotted Redshank. The site supports Short-eared Owl in winter (NPWS, 2014a).	- Shoveler <i>Anas clypeata</i> [A056] - Oystercatcher <i>Haematopus ostralegus</i> [A130] - Golden Plover <i>Pluvialis apricaria</i> [A140] - Grey Plover <i>Pluvialis squatarola</i> [A141] - Knot <i>Calidris canutus</i> [A143] - Sanderling <i>Calidris alba</i> [A144] - Dunlin <i>Calidris alpina</i> [A149] - Black-tailed Godwit <i>Limosa limosa</i> [A156] - Bar-tailed Godwit <i>Limosa lapponica</i> [A157] - Curlew <i>Numenius arquata</i> [A160] - Redshank <i>Tringa totanus</i> [A162] - Turnstone <i>Arenaria interpres</i> [A169] - Black-headed Gull <i>Chroicocephalus ridibundus</i> [A179] - Wetland and Waterbirds [A999] (NPWS, 2015b)	Medium impact (both) (EEA, 2020c)
South Dublin Bay and River Tolka Estuary SPA (004024)	This designated site comprises of the intertidal area in the south bay, as well as much of the Tolka Estuary to the north of the River Liffey. A portion of the shallow bay waters is also included. The sediments are predominantly well-aerated sands. The sands support the largest stand of Dwarf Eelgrass on the east coast of Ireland. Sediments in the Tolka Estuary vary from soft thixotropic muds with a high organic content in the inner estuary to exposed, well aerated sands off the Bull Wall. The site possesses extensive intertidal flats which support wintering waterfowl which are part of the overall Dublin Bay population. It regularly has an internationally important population of Light-bellied Brent Geese, which feeds on Dwarf Eelgrass in the autumn. It has nationally important numbers of a further 6 species including: Oystercatcher, Ringed Plover, Red Knot, Sanderling, Dunlin and Bar-tailed Godwit. It is an important site for wintering gulls, especially Black-headed Gull and Common Gull <i>Larus canus</i> . South Dublin Bay is the premier site in Ireland for Mediterranean Gull <i>Larus melanocephalus</i> , with up to 20 birds present at times. Is a regular autumn roosting ground for significant numbers of terns, including	- Light-bellied Brent Goose <i>Branta bernicla hrota</i> [A046] - Oystercatcher <i>Haematopus ostralegus</i> [A130] - Ringed Plover <i>Charadrius hiaticula</i> [A137] - Grey Plover <i>Pluvialis squatarola</i> [A141] - Knot <i>Calidris canutus</i> [A143] - Sanderling <i>Calidris alba</i> [A144] - Dunlin <i>Calidris alpina</i> [A149] - Bar-tailed Godwit <i>Limosa lapponica</i> [A157] - Redshank <i>Tringa totanus</i> [A162] - Black-headed Gull <i>Chroicocephalus ridibundus</i> [A179] - Roseate Tern <i>Sterna dougallii</i> [A192] - Common Tern <i>Sterna hirundo</i> [A193] - Arctic Tern <i>Sterna paradisaea</i> [A194] - Wetland and Waterbirds [A999] (NPWS, 2015d)	Urbanised areas, human habitation: High impact (outside) (EEA, 2020d)

Site Name	Brief	KERs (QIs / SCIs)	Project-relevant Threats: Impact (Source)
	Roseate Terns, Common Tern and Arctic Tern (NPWS, 2015c).		
North-West Irish Sea SPA (004236)	The North-West Irish Sea SPA constitutes an important resource for marine birds; it includes the estuaries and bays that open into it along with the collection of intertidal and subtidal habitats that stretch along the coast. These areas provide habitats for foraging and maintenance for SCI seabirds on the North-West Irish Sea's islands and coastal headlines which are important during and outside the breeding period. The site is of conservation interest for many bird species (NPWS, 2023a).	- Common Scoter <i>Melanitta nigra</i> [A065] - Red-throated Diver <i>Gavia stellata</i> [A001] - Great Northern Diver <i>Gavia immer</i> [A003] - Fulmar <i>Fulmarus glacialis</i> [A009] - Manx Shearwater <i>Puffinus puffinus</i> [A013] - Shag <i>Phalacrocorax aristotelis</i> [A018] - Cormorant <i>Phalacrocorax carbo</i> [A017] - Little Gull <i>Larus minutus</i> [A177] - Kittiwake <i>Rissa tridactyla</i> [A188] - Black-headed Gull <i>Chroicocephalus ridibundus</i> [A179] - Common Gull <i>Larus canus</i> [A182] - Lesser Black-backed Gull <i>Larus fuscus</i> [A183] - Herring Gull <i>Larus argentatus</i> [A184] - Great Black-backed Gull <i>Larus marinus</i> [A187] - Little Tern <i>Sterna albifrons</i> [A195] - Roseate Tern <i>Sterna dougallii</i> [A192] - Common Tern <i>Sterna hirundo</i> [A193] - Arctic Tern <i>Sterna paradisaea</i> [A194] - Puffin <i>Fratercula arctica</i> [A204] - Razorbill <i>Alca torda</i> [A200] - Guillemot <i>Uria aalge</i> [A199] (NPWS, 2023b)	Not currently listed by the European Environment Agency website given that the site has only recently confirmed its status as a fully designated Natura 2000 site.

Table 4-5: Nationally designated site (proposed Natural Heritage Areas) briefs and their respective KERs of conservation concern within the Zol

Site Name	Brief	KERs
Liffey Valley pNHA (000128)	The Liffey Valley site is situated along the River Liffey between Leixlip Bridge on the Kildare-Dublin border and downstream of the weir at Glenaulin, Palmerstown, Co. Dublin. The river hosts an Atlantic Salmon population and there are a series of weirs along the river between	- Atlantic Salmon <i>Salmo salar</i> - Green Figwort <i>Scrophularia umbrosa</i>

Site Name	Brief	KERs
	Palmerstown and Leixlip. The main terrestrial habitat included within the site is mixed deciduous woodland on fertile, limey alluvium and boulder clay, in which Beech is dominant in some areas. These woodlands occur on both sides of the river and normally consist of old estate woodlands. A wet marsh occurs on the strip of land between the Mill Race and the river east of the metal bridge and west of the paint factory. This marsh is fed by seepage from the Mill Race and plant species such as Bulrush <i>Typha latifolia</i> , Marsh-marigold <i>Caltha palustris</i> and sweet-grass <i>Glyceria</i> spp. occur here. The threatened Green Figwort <i>Scrophularia umbrosa</i> , a species listed in the Irish Red Data Book, is recorded from a number of stations along the river within the site. The rare and legally protected Hairy St. John's-wort <i>Hypericum hirsutum</i> (Flora Protection Order 1987) has been recorded from the woodlands in this site. The threatened Yellow Archangel, listed in the Irish Red Data Book, is also recorded from these woodlands (NPWS, 2009).	- Hairy St. John's-wort <i>Hypericum hirsutum</i> - Yellow Archangel <i>Lamiastrum galeobdolon</i> - Otter <i>Lutra lutra</i> - Kingfisher <i>Alcedo atthis</i> - Lamprey <i>Lampetra</i> spp. - European Eel <i>Anguilla anguilla</i>
Dolphins, Dublin Docks (000201)	As per South Dublin Bay and River Tolka Estuary SPA description in Table 4-4.	Species associated with the docks as outlined in South Dublin Bay and River Tolka Estuary SPA description.
North Dublin Bay (000206)	As per North Dublin Bay SAC description in Table 4-4.	As per those outlined in North Dublin Bay SAC and North Bull Island SPA descriptions.
South Dublin Bay (000210)	As per South Dublin Bay SAC description in Table 4-4.	As per those outlined in South Dublin Bay SAC and South Dublin Bay and River Tolka Estuary SPA (those which relate to southern bay area only) descriptions.

Other Designated Sites

A number of other designated sites are present within the Zol of the proposed Scheme, including four Ramsar wetland sites, one Special Amenity Area Orders (SAAO) and the UNESCO Dublin Bay Biosphere. Biodiversity receptors in these other designated sites are assessed along with the Natura 2000 sites, where overlap occurs.

Ramsar Sites

The two Ramsar sites located within the proposed development's Zol are as follows:

- Sandymount Strand/Tolka Estuary [Site code: 832]; and
- North Bull Island [Site code: 406].

The impact assessment of the above Ramsar sites, which are located within Natura 2000 sites and pNHAs, is examined thoroughly under the assessment of Natura 2000 sites and pNHAs in impact assessment section and therefore will not be examined separately.

Special Amenity Area Orders (SAAO)

The Liffey Valley is the only SAAO area present within the Zol of the proposed development. The SAAO looks to protect areas with noteworthy landscapes, nature and amenity. These areas were placed on a statutory footing under the Local Government (Planning and Development) Act 1963 [including amendments]; and re-enacted under section 202 of the Planning and Development Act 2000. These areas have been designated as a result of the remarkable aesthetics they present, as well as the need to conserve the nature contained within them.

The ecological impact assessment of the SAAO area, which is located within the Liffey Valley pNHAs, is examined thoroughly under the assessment of Liffey Valley pNHAs and local habitats within Zol in the impact assessment section and therefore will not be examined separately.

UNESCO Dublin Bay Biosphere

The UNESCO Dublin Bay Biosphere extends to over 300km² of marine and terrestrial habitat, including North Bull Island and other ecologically significant habitats, such as the Tolka and Baldoyle Estuaries, Howth Head, Dalkey Island, Killiney Hill and Booterstown Marsh.

The ecological impact assessment of the UNESCO Dublin Bay Biosphere, which is located within Natura 2000 sites and pNHAs, is examined thoroughly under the assessment of Natura 2000 sites and pNHAs in impact assessment section and therefore will not be examined separately.

4.4.2 Ecological Baseline Surveying

The initial ecological walkover was conducted on the 01/02/2023 by JBA Ecologists, followed by numerous subsequent site surveys, specifically examining habitats, flora, invasives, non-volant mammals, and breeding birds. Bat-related surveying was provided over a multi-year period by Ganon & Associates Ltd. Descriptions of habitats and associated species are provided in the sub-sections below.

4.4.2.1 Habitats

A list of habitats recorded during the initial ecological walkover and subsequent habitat surveys are listed in Table 4-6 and mapped in Figure 4-3 below, and are presented in detail in the following sub-sections.

Table 4-6: List of habitats (Fossitt Classification) recorded on site

Fossitt Habitat	Fossitt Code	Linked KERs Recorded On-site (Presence/Utilisation/Hydrological Link)
Stone walls and other stonework	BL1	Three bat spp. (P) Green-listed bird spp. (P / U) Invertebrate (pollinator) spp. (P / U)
Buildings and artificial surfaces	BL3	Three bat spp. (P) Green-listed bird spp. (P / U)

Fossitt Habitat	Fossitt Code	Linked KERs Recorded On-site (Presence/Utilisation/Hydrological Link)
		Amber-listed bird spp. (P / U) Invertebrate (pollinator) spp. (P)
Mosaic: Spoil and bare ground / Dry meadows and grassy verges	ED2 / GS2	Three bat spp. (P) Green-listed bird spp. (P) Amber-listed bird spp. (P) Invertebrate (pollinator) spp. (P)
Mosaic: Recolonising bare ground / Scrub	ED3 / WS1	Three bat spp. (P) Green-listed bird spp. (P) Amber-listed bird spp. (P) Invertebrate (pollinator) spp. (P)
Drainage ditches	FW4	Green-listed bird spp. (P) Hydrological Link to River Liffey
Mosaic: Improved agricultural grassland / Dry meadows and grassy verges	GA1 / GS2	Green-listed bird spp. (P) Amber-listed bird spp. (P) SCI Herring Gull (P) Invertebrate (pollinator) spp. (P)
Amenity grassland	GA2	Badger (P) Green-listed bird spp. (P)
Dry meadows and grassy verges	GS2	Three bat spp. (P) Green-listed bird spp. (P) Amber-listed bird spp. (P) Invertebrate (pollinator) spp. (P)
Mosaic: Dry meadows and grassy verges / Scrub	GS2 / WS1	Green-listed bird spp. (P)
(Mixed) broadleaved woodland	WD1	Hairy St John's-wort (P) Badger (P / U) Four bat spp. (P) Green-listed bird spp. (P / U) Amber-listed bird spp. (P) Invertebrate species groups (P)
Mixed broadleaved / conifer woodland	WD2	Green-listed bird spp. (P / U) Amber-listed bird spp. (P)
Scattered trees and parkland	WD5	Green-listed bird spp. (P)
Hedgerows	WL1	Green-listed bird spp. (P)
Treelines	WL2	Green-listed bird spp. (P) Amber-listed bird spp. (P)
Scrub	WS1	Green-listed bird spp. (P)

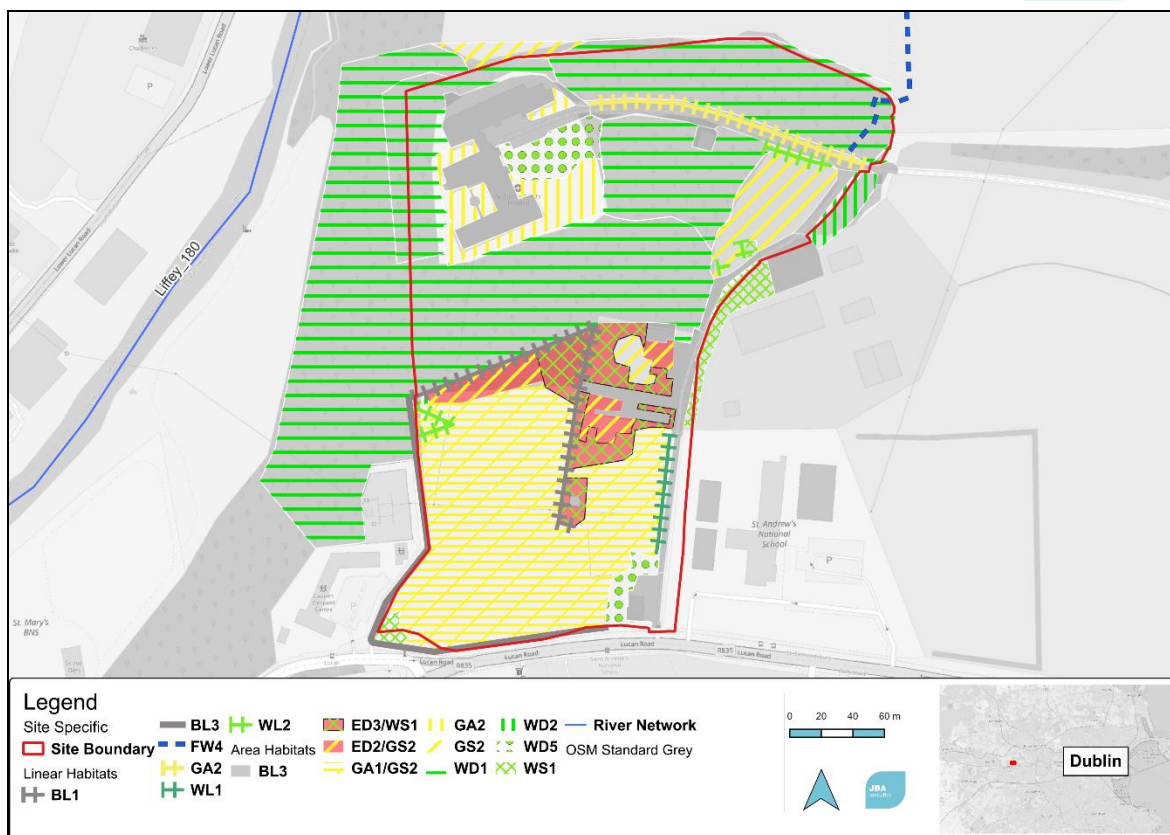


Figure 4-3: Habitat Map (OSM, 2026)

There are two KERs that occur within the ZoI of the proposed development, which are not directly linked (not present / no evidence of habitation during surveys) with any of above habitats that occur within or immediately adjacent to the development's site boundary. These KERs are listed below along with their rationale for inclusion within the chapter assessment:

- Pine Marten – Recent JBA survey data places Pine Marten in the Liffey Valley locality (within 1km) of the proposed development. This species is to be included in the assessment under the precautionary principle as the local Pine Marten population is likely to extend their territory into the woodlands in and around the proposed development; and
- Hedgehog – Recent NBDC data places Hedgehog within the immediate locality of the proposed development. This species is to be included in the assessment under the precautionary principle as the local Hedgehog population territory range already extends into the proposed site.

Stone walls and other stonework (BL1)

There are large stone walls which divide the woodland, grassland and farmyard sections of the site. These walls contain numerous small holes that have the potential to support the nesting of solitary and mason bee species (Figure 4-4); however, observers did not note any bees utilising these holes during any of the ecological surveys. Shorter stone walls also extend along the western and southern boundaries of the grassland habitat within the southern half of the site. Modern stone walls are also present throughout sections of the farmyard area.

Historic stone buildings are located close to the centre of the grassland section, these structures are comprised of a belfry, and a couple of historic farm buildings, which have degraded to the extent that only the stone walls are left (remainder of farm buildings described in the following sub-section. These stone walls contained numerous potential bat roost features; the details are outlined within the G&A Bat Report (See Appendix X.X.X). These stone structures support a range of flora including Ivy *Hedera helix*; Bramble *Rubus fruticosus* (agg.); Red Valerian *Centranthus ruber*; Ivy-leaved Toadflax *Cymbalaria muralis*; Herb-Robert *Geranium robertianum*; Common Polypody *Polypodium vulgare*; Ivy Broomrape *Orobanche hederaceae*; Ragwort *Jacobaea vulgaris*; Hedge

Bindweed *Calystegia sepium*; Hart's-tongue Fern *Asplenium scolopendrium*; and a small number of young Elder *Sambucus nigra*.

These habitats contained medium-impact invasive species, namely Butterfly-bush *Buddleia davidii* and Sycamore saplings.

Small bird nests were also recorded within degraded gaps in the historic stone walls, though their occupants were not present during surveying. Bird species recorded along the stone walls included Robin *Erithacus rubecula*; Blackbird *Turdus merula*; Coal Tit *Periparus ater*; Bullfinch *Pyrrhula pyrrhula*; Siskin *Spinus spinus*; and Wood Pigeon *Columba palumbus*. Of the above species, the Robin and Blackbird are the most likely to have built/occupied the observed nests.

Other fauna recorded utilising this habitat included Common Pipistrelle *Pipistrellus pipistrellus*; Soprano Pipistrelle *Pipistrellus pygmaeus*, Leisler's Bat *Nyctalus leisleri*; Small Tortoiseshell butterfly *Aglais urticae*; and Common Wasp *Vespula vulgaris*.

Given this habitat's capacity to support potential bat roosts, active breeding bird nests, and potential solitary and mason bee nesting, it has been deemed to be of high local ecological importance.



Figure 4-4: Stone wall, containing holes appropriate for solitary and mason bee species



Figure 4-5: Vegetated historic stone wall and belfry located south of the farmyard

Buildings and artificial surfaces (BL3)

There are two main buildings within the northern section of the site, which include the historic St Edmundsbury house / hospital and the neighbouring single-storey ward. There are also footpaths, car parking and storage facilities present within this northern area of the site. Two roadways run from the north-east corner of the site, with one heading west towards the hospital, while the other heads south through the farmyard area and down to the site's southern border where it connects with the Lucan Road. Beside this site entrance are the two Dean Clinic buildings. All of the above buildings have bat roost potential, the details of which are detail G&A Bat Report in Appendix X.X.X

Historic farm buildings, modern storage sheds and a paved farmyard area are present in the central area of the site (Figure 4-6). These buildings and the courtyard support a range of flora including Ivy; Red Valerian; Fairy Foxglove; Bramble; and invasive Butterfly-bush and Sycamore saplings.

These farmyard buildings support at least 20 bird nests (ground-based survey count), including Blackbird; Feral Pigeon *Columba livia domestica*; House Martin *Delichon urbicum* and Barn Swallow *Hirundo rustica* (Figure 4-7). The two latter bird species are currently Amber-listed birds of conservation concern in Ireland (BoCCI 2020-2026).

Other fauna observed utilising these habitats includes Common Pipistrelle, Soprano Pipistrelle, Leisler's Bat; Wood Pigeon, Blackcap *Sylvia atricapilla*, Wren *Troglodytes troglodytes*, Jackdaw *Corvus monedula*, Magpie *Pica pica*; Common Wasp; White-tailed Bumblebee *Bombus lucorum*, Common Carder-bee *Bombus pascuorum*; and Small Tortoiseshell.

This habitat type is considered to be of high local ecological importance, given its capacity to support potential bat roosts and active breeding bird nests, as well as foraging resources for all local fauna.



Figure 4-6: The barn's Ivy-clad exterior walls also supporting Red Valerian and Fairy Foxglove



Figure 4-7: House Martin nest within the modern shed building to the north of the farmyard

Mosaic: Spoil and bare ground / Dry meadows and grassy verges (ED2 / GS2)

There are patches of mosaiced bare ground and dry meadow habitats located within and adjacent to the farmyard area. These mosaiced habitats contained False Oat-grass *Arrhenatherum elatius*; Perennial Rye-grass *Lolium perenne*; White Clover *Trifolium repens*; Chickweed *Stellaria media*; Wood Avens *Geum urbanum*; Ragwort; Ivy; Ivy Broomrape; Herb-Robert; Red Valerian; Smooth Sowthistle *Sonchus oleraceus*; Dandelion *Taraxacum* spp.; Creeping Buttercup *Ranunculus*

repens; Marsh Pennywort *Hydrocotyle vulgaris*; Colt's-foot *Tussilago farfara*; Common Plantain *Plantago major*; and Common Couch *Elytrigia repens*.

Fauna recorded within this habitat included Common Pipistrelle, Soprano Pipistrelle, Leisler's Bat; Blackbird, House Martin, Barn Swallow, Rook *Corvus frugilegus*, Wren; Small Tortoiseshell; and Common Carder-bee.

This habitat is considered to have low local ecological importance given that it does not yet support the flora diversity of fully formed dry meadow, and as a result provides limited resources for the local fauna.

Mosaic: Recolonising bare ground / Scrub (ED3 / WS1)

There is a mosaic of recolonising bare ground and scrub located adjacent to the joining point of the large eastern and northern stone wall sections, west of the farmyard area. The floral assemblage of this mosaic habitat contained Bramble; Spear Thistle *Cirsium vulgare*; Creeping Thistle *Cirsium arvense*; Ivy; Ivy Broomrape; Cleavers *Gallium aparine*; White Clover; Herb-Robert; Nettle *Urtica dioica*; Common Polypody; Hart's-tongue Fern; American Willowherb *Epilobium ciliatum*; Great Willowherb *Epilobium hirsutum*; Ash *Fraxinus excelsior*; Blackthorn *Prunus spinosa*; Dog-rose *Rosa canina*; and Elder saplings; and the invasive Butterfly-bush and Sycamore saplings.

Common Pipistrelle, Soprano Pipistrelle, Leisler's Bat; Linnet *Linaria cannabina*; and White-tailed Bumblebee were observed utilising this mosaic habitat.

This mosaic habitat is considered to have high local ecological importance given its capacity to provide nesting and hive-building opportunities for breeding birds and hive-building invertebrates species, respectively. This habitat also provides foraging resources and refuge for all local fauna.

Drainage ditches (FW4)

A drainage ditch is located within the woodland to the north-east of the proposed site (Figure 4-8). This ditch flows into the agricultural grassland to the north of the site, where it continues downstream towards the River Liffey. As there were no instream flora present, its flora diversity matches that of the woodland floor, with Ivy; Male-fern *Dryopteris filix-mas*; Hart's-tongue Fern and moss species growing along the banks of the ditch. The ditch itself mainly contains silt sediment, with sporadic patches of cobble and gravel, as well as a notable amount of woodland detritus.

Blackbird, Blackcap, and Pheasant *Phasianus colchicus* were recorded utilising this aquatic habitat by surveyors.

This habitat is considered to have high local ecological importance given that is the only open water source within the site for local fauna, as well as its downstream connection to the River Liffey (and other sections of the Liffey Valley pNHA).



Figure 4-8: A section of the drainage ditch located in the north-east of the site

Mosaic: Improved agricultural grassland / Dry meadows and grassy verges (GA1 / GS2)

The majority of the grassland section of the site includes an improved grassland, which has been gradually naturalising, over the course of the multi-year surveys on-site. Floral species recorded within this grassland habitat included Perennial Rye-grass; Yorkshire Fog *Holcus lanatus*; Cock's-foot *Dactylus glomerata*; False Oat-grass; Common Couch; Ragweed; Dandelion spp.; Red Clover *Trifolium pratense*; Creeping Thistle; Yarrow *Achillea millefolium*; Ribwort Plantain *Plantago lanceolata*; Broad-leaved Dock *Rumex obtusifolius*; Creeping Buttercup; Bramble; Creeping Cinquefoil *Potentilla reptans*; Goat's-beard *Tragopogon pratensis* located in patches (Figure 4-9).

JBA surveyors recorded Blackbird, Blue Tit *Cyanistes caeruleus*, Bullfinch, Buzzard *Buteo buteo*; Herring Gull *Larus argentatus*, House Martin, Barn Swallow, Linnet, Wood Pigeon *Columba palumbus*, Robin, Rook, Wren; Small Tortoiseshell butterfly; and White-tailed Bumblebee foraging /hunting within this grassland habitat.

There were several small- to medium-sized mammal burrows within this habitat, which have been attributed to the presence of the invasive European Rabbit *Oryctolagus cuniculus*.

This habitat is considered to have high local ecological importance given the increasing floral diversity it has displayed since first surveyed in 2023; as well as its capacity to provide foraging, refuge, nesting and relatively sheltered commuting for all local fauna, including those of conservation concern.



Figure 4-9: The naturalising pastoral grassland with patches of dry meadow habitat

Amenity grassland (improved) (GA2)

The roadway entrance to the hospital site, is flanked by amenity grassland (Figure 4-10). There are also sections of amenity grassland adjacent to the main hospital buildings, as well as to rear of the Deans Clinic buildings in south-east corner of the site. These areas are maintained for amenity purposes and have very limited floral species diversity as a result. These grasslands only support several flora species including Daisy *Bellis perennis*; Perennial Ryegrass; White Clover; Dandelion spp.; and Ribwort Plantain, as well as moss species, where wetter topographical depressions are present.

Ecological surveyors recorded Badger *Meles meles* snuffle-holes (foraging); Wren, Wood Pigeon, Song Thrush *Turdus philomelos*, Robin, Mistle Thrush *Turdus viscivorus*, Chaffinch *Fringilla coelebs*, and Blackbird foraging within these amenity grasslands.

This habitat is considered to have low local ecological importance as it provides some foraging opportunities for local non-volant mammals, such as the local Badger population.



Figure 4-10: The road to the hospital flanked by amenity grassland strips

Dry meadows and grassy verges (GS2)

There is a section of dry meadow located in the north-east section of the site (

Figure 4-11), adjacent to the woodlands and the roadways, as well as a patch within the barn courtyard area and strip a meadow strip along the southern eastern site border. These meadow habitats support flora such as, False Oat-grass; Cock's Foot; Perennial Rye-grass; Yorkshire Fog; Meadow Foxtail *Alopecurus pratensis*; Common Bent *Agrostis capillaris*; Red Fescue *Festuca rubra*; Common Couch; Bush Vetch *Vicia sepium*, Cow Parsley; Herb-Robert; Creeping Buttercup; Curly Dock *Rumex crispus*; Dandelion spp.; Nettle; Bilbao Fleabane *Erigeron floribundus*; Red Valerian; Red Bartsia *Odontites vernus*; Field Forget-me-not *Myosotis arvensis*; Common Mouse-ear *Cerastium fontanum*; Scarlet Pimpernel *Anagallis arvensis*; Ragwort; Field Speedwell *Veronica agrestis*; Fairy Foxglove *Erinus alpinus*; Small-flowered Cranes-bill *Geranium pusillum*; Cut-leaved Cranes-bill *Geranium dissectum*; Common Vetch *Vicia sativa*; Meadow Vetchling *Lathyrus pratensis*; White Clover; Red Clover; Lesser Trefoil *Trifolium dubium*; Common Knapweed *Centaurea nigra*; Common Plantain; Smooth Sowthistle; Spiny Sowthistle *Sonchus asper*; Creeping Thistle; Spear Thistle; Tutsan *Hypericum androsaemum*; Cleavers; Goat's-beard; Cat's-ear *Hypochaeris radicata*; and Hogweed *Heracleum sphondylium*.

Fauna recorded within these dry meadow habitats included Common Pipistrelle, Soprano Pipistrelle, Leisler's Bat; Blue Tit, Wood Pigeon, Robin, Blackbird, Chiffchaff *Phylloscopus collybita*, Greenfinch *Chloris chloris*, Great Tit *Parus major*, Goldcrest *Regulus regulus*, House Martin, Linnet, Blackcap, Barn Owl *Tyto alba*, Long-eared Owl *Asio otus*; Small Tortoiseshell; Common Carder-bee, White-tailed Bumblebee; Common Wasp; and European Drone Fly *Eristalis arbustorum*.

These meadow habitats are considered to have high local ecological importance given that they host a moderate range of flora, as well as their capacity to provide foraging /hunting resources, refuge, nesting and relatively sheltered commuting for all local fauna.



Figure 4-11: White-tailed Bumblebee foraging on Knapweed within the courtyard meadow

Mosaic: Dry meadows and grassy verges / Scrub (GS2 / WS1)

Immediately north-west of the mosaiced pastoral and dry meadow habitat, a mixed patch of dry meadow and scrub supports Hogweed, False Oat-grass, Herb-Robert, Couch, Lords-and-ladies *Arum maculatum*, Ragwort, Bramble and Hawthorn *Crataegus monogyna*.

Surveyors recorded Blackbird; Long-tailed Tit *Aegithalos caudatus*; Wood Pigeon; Robin and Wren utilising this habitat.

This habitat is considered to have high local ecological importance given its capacity to provide foraging, refuge and nesting opportunities for local fauna.

(Mixed) broadleaved woodland (WD1)

This mixed broadleaved woodland habitat is present within the northern, western and central sections of the proposed site (Figure 4-14). The woodland section west and south of the hospital, i.e., the woodlands within the Liffey Valley pNHA, included species such as Pedunculate Oak *Quercus robur*; Ash; Holly *Ilex aquifolium*; Scot's Pine *Pinus sylvestris*; Horse Chestnut *Aesculus hippocastanum* sapling; Beech *Fagus sylvatica*; Black Pine *Pinus nigra*; Grey Willow *Salix cinerea*; English Elm *Ulmus procera*; Small-leaved Lime *Tilia cordata*; Elder; Male-fern; Soft Shield-fern *Polystichum setiferum*; Hart's-tongue Fern; Pendulous Sedge *Carex pendula*; Bluebell *Hyacinthoides non-scripta*; Ramsons *Allium ursinum*; Lesser Celandine *Ficaria verna*; Wood Sedge *Carex sylvatica*; Common Dog-violet *Viola riviniana*; Wood Anemone *Anemone nemorosa*; Ivy Broomrape; Bramble; Climbing Nightshade *Solanum dulcamara*; Lords-and-ladies; Ivy; Great Mullein *Verbascum thapsus*; Hemp-agrimony *Eupatorium cannabinum*; Nettle; Woodland Figwort *Scrophularia nodosa*; Hedge Woundwort *Stachys sylvatica*; Creeping Buttercup; Wood Dock *Rumex sanguineus*; Scaly Male-fern *Dryopteris affinis*; Hogweed; Ground-elder *Aegopodium podagraria*; Cleavers; and the protected Hairy St John's-wort *Hypericum hirsutum* (though its location is approximately 70m west of the western site boundary). The woodland floor also supported Common Liverwort *Marchantia polymorpha*.

Within this woodland habitat are sections of notable stands of invasive species including relatively widespread Cherry Laurel *Prunus laurocerasus* and Sycamore *Acer pseudoplatanus*, with some Cherry Laurel growing to the same canopy height of the semi-mature trees (lower canopy). There are sporadic patches of Butterfly-bush; Rock Cotoneaster *Cotoneaster horizontalis*, Milkflower Cotoneaster *Cotoneaster coriaceus*; garden escapee Spotted Laurel *Aucuba japonica*; and a Palm tree species that are also present within this woodland. These invasive floral species are largely concentrated within the woodland the separates the historic farmyard from the hospital buildings.

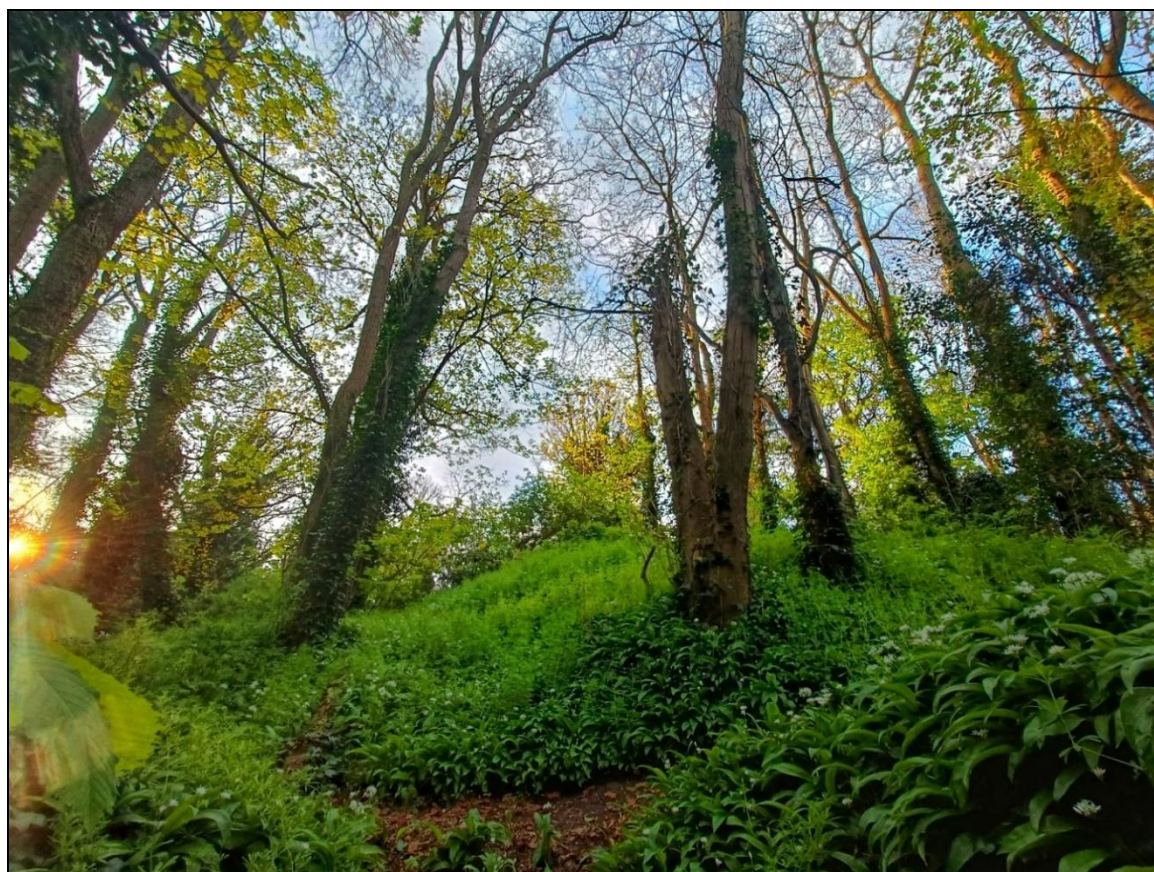


Figure 4-12: The pNHA mixed broadleaved woodland section during late spring

Ecological surveyors recorded Badger *Meles meles* paw-prints within the pNHA section of the woodland. Additionally, three inactive Badger satellite setts were recorded within the northern boundary woodland, with addition satellite sett located approximately 20m north-west of the site's northwestern corner. Repeated surveying of these setts, suggest that they are infrequently used by the local Badger population, and are not approaching the status of annex or core setts.

Surveyors also recorded Brown Long-eared Bat *Plecotus auritus*, Common Pipistrelle, Soprano Pipistrelle, Leisler's Bat; Long-eared Owl, Buzzard (Figure 4-13), Blue Tit, Wood Pigeon, Blackcap, Spotted Flycatcher *Muscicapa striata*, Stock Dove *Columba oenas*, Goldcrest, Song Thrush, Mistle Thrush, Hooded Crow *Corvus cornix*, Robin, Magpie, Wren, Chiffchaff, Treecreeper *Certhia familiaris*, Long-tailed Tit, Great Tit, Goldfinch *Carduelis carduelis*, Chaffinch, Raven *Corvus corax*; Starling *Sturnus vulgaris*, Jackdaw, Pheasant, Dunnock *Prunella modularis*, Coal Tit, Jay *Garrulus glandarius*, Rook, Greenfinch; Azure Damselfly *Coenagrion puella*, Banded Demoiselle *Calopteryx splendens*; Peppered Moth (caterpillar) *Biston betularia*; Speckled Wood *Pararge aegeria*; Common Carder-bee, White-tailed Bumblebee; Common Wasp; and a Buff-tailed Bumblebee *Bombus terrestris* queen across these woodland sections.



Figure 4-13: Buzzards were recorded within the pNHA woodland section frequently

Between the hospital buildings and the dry meadow to the east, is a younger, less diverse, section of woodland (outside of pNHA boundary) that contains a higher abundance of Ash, along with occasional Beech, Holly, Alder *Alnus glutinosa*, Elder, Horse Chestnut, Sycamore, Bramble, Ivy, Pedunculate Oak, Wood Sedge; Wood Dock; Silver Birch *Betula pendula* and Pendulous Sedge.

These mixed woodlands also hosted fungi species such as Dryad's Saddle *Polyporus squamosus* (Figure 4-14).

The woodland present within the boundary of the Liffey Valley pNHA is considered to have national ecological importance, while the woodland found beyond these boundaries is considered to have county-level ecological importance given its potential to reach the quality of the neighbouring designated woodland.



Figure 4-14: One several notable stands of Dryad's Saddle present within the woodland

The mixed woodland present within the boundary of the Liffey Valley pNHA is considered to have national ecological importance, while the woodland located beyond these boundaries is considered to have county level ecological importance given its potential to reach the quality of the neighbouring designated woodland as it continues to establish a greater diversity of understorey woodland flora and alongside the maturation of the existing trees.

(Mixed) broadleaved / conifer woodland (WD2)

There is a strip of mixed broadleaved and conifer woodland present in the north-eastern area of the site which supported *Leylandii* spp.; Downy Birch *Betula pendula*; Ivy; and Bramble, as well as two invasive species, namely Butterfly-bush and Cherry Laurel.

Fauna observed within woodland strip included Great Tit; Song Thrush; Long-tailed Tit; Robin; Blackbird; Blackcap; Chiffchaff; Wren; Chaffinch; House Sparrow *Passer domesticus*; and Wood Pigeon.

This woodland strip is considered to have high local ecological importance given its capacity to provide foraging, refuge and nesting opportunities for local fauna.

Scattered trees and parkland (WD5)

Immediate south of the hospital car park area is a small section of scattered trees and parkland. The tree species include a number of deciduous and coniferous ornamental trees and shrubs, with a mown amenity grassland dominated by Perennial Rye-grass, with some occasional Daisy and Dandelion spp. present.

Surveyors noted the presence of Wood Pigeon and Blackbird within this highly-managed habitat.

This habitat is considered to have low local ecological importance, with the majority of its value stemming from its limited foraging resources and capacity to support nesting birds.



Figure 4-15: The scattered tree and amenity area adjacent to the existing hospital area

Hedgerow (WL1)

North of the Deans Clinic buildings, a hedgerow runs along the western edge of one of the site's roadways. This hedgerow supports Hawthorn; Blackthorn; Ash; Ivy; Bramble; Hogweed; False Oat-grass and Cleavers.

JBA surveyors recorded Wren; Bullfinch; Blackcap; Song Thrush; Feral Pigeon; Great Tit; Blackbird; Robin; and Hooded Crow utilising this hedgerow.

This linear habitat is considered to have high local ecological importance given their capacity to provide foraging and nesting opportunities for local fauna.

Treelines (WL2)

There are small number of short treelines located within different areas of the site, which includes a V-shaped treeline (no overlapping canopy to form woodland patch) located in the north-west of the main grassland area, which is comprised of Ash, Cedar *Cedrus* spp., Hawthorn and Sycamore, with a Bramble and Ivy dominated understorey; three other short treelines located around the edge of the north-eastern dry meadow; another treeline adjoins the hedgerow habitat west / north-west of the Deans Clinic buildings, and another very short treeline (bisected by southern road entrance) is located in the south-eastern corner of the site. Tree species within these treelines include Ash; Sycamore; Holly; Lawson Cypress *Chamaecyparis lawsoniana*; Alder; Pedunculate Oak; and Blackthorn. The understorey of these treelines varied from amenity grassland flora to dry meadow; to a typical Bramble; Ivy; Cleavers; Hogweed and Hedge Bindweed composition.

Fauna recorded within these linear habitats included Feral Pigeon; Blackbird; Blackcap; Song Thrush; Long-tailed Tit; Great Tit; Wren; Robin; Blue Tit; Goldcrest; Dunnock; Linnet; and Wood Pigeon.

These linear habitats are considered to have high local ecological importance given their capacity to provide foraging for a range of local fauna and nesting opportunities for breeding bird populations.

Scrub (WS1)

A small patch of scrub is located in the south-west corner of the site, while a strip of scrub of vegetation runs along the eastern site boundary. This scrub habitat is dominated by Bramble, with occasional Downy Birch saplings, Great Willowherb, False Oat-grass and Ivy. The habitat also contained some deadwood piles. A second section of scrub is located within the dry meadow in the north-east of the site, which was also dominated with Bramble, with occasional Spear Thistle present.

Surveyors observed Blackbird; Siskin; Wren; Dunnock and Coal Tit utilising the scrub habitats present on-site.

These scrub habitats are considered to have high local ecological importance given their capacity to provide foraging and refuge for a range of local fauna, as well as nesting opportunities for breeding bird populations.

4.4.3 Rare & Protected Flora

Given the potential for the protected Hairy St John's Wort (Flora Protection Order, 2022) and the rare Yellow Archangel *Lamium galeobdolon*; Green Figwort *Scrophularia umbrosa*; Toothwort *Lathraea squamaria*; and Hairy Violet *Viola hirta* to be present within multiple sections of the Liffey Valley pNHA, a targeted protected floral survey was conducted of woodlands within and adjacent to the proposed site. The surveyors recorded the presence of one individual Hairy St John's Wort (Figure 4-16), located approximately 70m west of the proposed site, along the western edge of the pNHA woodland. While only one individual was present in 2023; a small population has been recorded in this location since 2005. The Hairy St John's-wort was not present during multiple checks to this location during its growing season in 2025. Surveyors noted that the location had become more shaded, contrasting notably with the sun-dappled individual shown in Figure 4-16. No other rare or protected floral species were recorded during the surveys.

This individual Hairy St John's Wort is considered to be of national ecological importance given its protection status, as well as its apparent scarcity within this section of the Liffey Valley pNHA.



Figure 4-16: Hairy St John's Wort along the western edge of the pNHA woodland

4.4.4 Fauna

Badger

JBA Ecologist recorded Badger paw-prints alongside the large stone wall separating the grassland and woodland. Additionally, two potential satellite / annex setts were recorded along the northern border of the site, along the edge of the woodland. Both potential setts were deemed inactive; and subsequent re-checks have confirmed that they have remained inactive over the length of the ecological surveying period. Badger is afforded protection under the Wildlife Act 1976 (and subsequent amendments).

The proposed site is considered to be of county level ecological importance for the local Badger population.



Figure 4-17: One of the inactive Badger satellite setts within the northern woodland section

Otter

The drainage ditch on-site was not capable of supporting fish, nor amphibian spawning, i.e., prey items that might attract an Otter from the River Liffey up the drainage ditch channel; therefore, Otter are not anticipated to navigate within or adjacent to the site. Otter regularly frequents the stretch of River Liffey adjacent to the site, hence their close association with the riparian zones within the Liffey Valley pNHA. Otter is afforded high level protection under Annexes I and IV of the EU Habitats Directive, as well as the Wildlife Act 1976 (and subsequent amendments).

The surface water network downstream of the proposed development is considered to be of national ecological importance for the local Otter population.

Pine Marten

There were no signs of Pine Marten habitation, i.e., individual sightings, commuting (tracks) or scat, recorded during the ecological walkover survey of the site and its surrounds. Although no record of Pine Marten was found, the woodland, hedgerow and treeline habitats present on-site, are suitable for this species and their presence should be presumed following the precautionary principle. Furthermore, JBA recently (March 2026) recorded Pine Marten 1km west of the site. As

male Pine Martens can have territories up to 400 hectares, it is possible that the recorded individual's territory may extend into the woodlands within and adjacent to the proposed site. Pine Marten is afforded protection under the Wildlife Act 1976 (and subsequent amendments), as well as Annex V of the EU Habitats Directive.

The proposed site is considered to be of high local ecological importance for the local Pine Marten population.

Hedgehog

No field signs including scat or tracks of Hedgehog were recorded on site or in the surrounding area during the ecological walkover survey. Although no record of Hedgehog was found, the woodland, hedgerow, treeline, scrub and grassy verge habitat is ideal for this species, and their presence should be presumed following the precautionary principle. Hedgehog is afforded protection under the Wildlife Act 1976 (and subsequent amendments).

The proposed site is considered to be of high local ecological importance for the local Hedgehog population.

Bats

The Gannon & Associates Ecologists recorded the presence of four bat species, namely Brown Long-eared Bat; Common Pipistrelle; Soprano Pipistrelle; and Leisler's Bat during the emergence surveys conducted on-site. For additional details on the bat activity surveys conducted between 2022 and 2025 please see the Gannon & Associates Bat Survey Report (2026) in Appendix X.X.X.

Recent NBDC records also indicate that two other bat species are present within the locality of the site, namely Daubenton's Bat *Myotis daubentonii* and Nathusius's Pipistrelle *Pipistrellus nathusii*.

The proposed site is considered to be of county level ecological importance for the local bat species.

Breeding Birds

Between April and June 2023, JBA Ecologists recorded a total of 33 bird species throughout and/or adjacent to the proposed development. This group of 33 birds included; one species listed a SCI for the North-West Irish Sea SPA; two Birds Directive Annex II & III species (both controlled hunting species, and only one native); seven Amber-listed (includes the SCI species); and 24 Green-listed bird species. Table 4-7 provides a summary of the recorded bird species that are afforded specific European protections and/or of conservation concern (Birds of Conservation Concern Ireland 2020-2026).

Table 4-7: Native protected and/or conservation concern breeding bird species recorded in 2023

Bird Species	Annex	SCI Species	Breeding (B) & Breeding / Wintering (B/W)
Greenfinch	-	-	Amber (B)
Barn Swallow	-	-	Amber (B)
Goldcrest	-	-	Amber (B)
Herring Gull	-	✓	Amber (B/W)
House Martin	-	-	Amber (B)
Linnet	-	-	Amber (B)
Spotted Flycatcher	-	-	Amber (B)
Wood Pigeon	II & III	-	-

Breeding bird surveys were conducted in June 2025, two in total with a five-day static survey to record breeding bird song and calls during this period to later undergo audio analysis. A total of 38 bird species were recorded throughout and/or adjacent to the proposed scheme's boundaries in the year 2025. This group of 38 birds included; one species listed as a SCI for the North-West Irish Sea SPA; two Birds Directive Annex II & III species (controlled hunting species); two Red-listed species; nine Amber-listed (includes the SCI species); and 25 Green-listed bird species. Table 4-8

provides a summary of the findings of the breeding bird surveys in the year 2025. Figure 4-18 displays the recording locations of native protected, SCI, and Red /Amber-listed bird species within the proposed site, bar the non-native species and those associated with hunting controls, i.e., Pheasant and Wood Pigeon, which are Green-listed, and Barn Owl, as the exact location was not recorded as it was an incidental recording.

Table 4-8: Native protected and/or conservation concern breeding bird species recorded in 2025

Bird Species	Annex	SCI Species	Breeding (B) & Breeding / Wintering (B/W)
Barn Swallow	-	-	Amber (B)
Barn Owl*	-	-	Red (B)
Goldcrest	-	-	Amber (B)
Greenfinch	-	-	Amber (B)
Herring Gull	-	✓	Amber (B/W)
House Martin	-	-	Amber (B)
House Sparrow	-	-	Amber (B)
Linnet	-	-	Amber (B)
Spotted Flycatcher	-	-	Amber (B)
Starling	-	-	Amber (B)
Stock Dove	-	-	Red (B)
Wood Pigeon	II & III	-	-

* Observed by G&A Surveyors during bat activity surveys

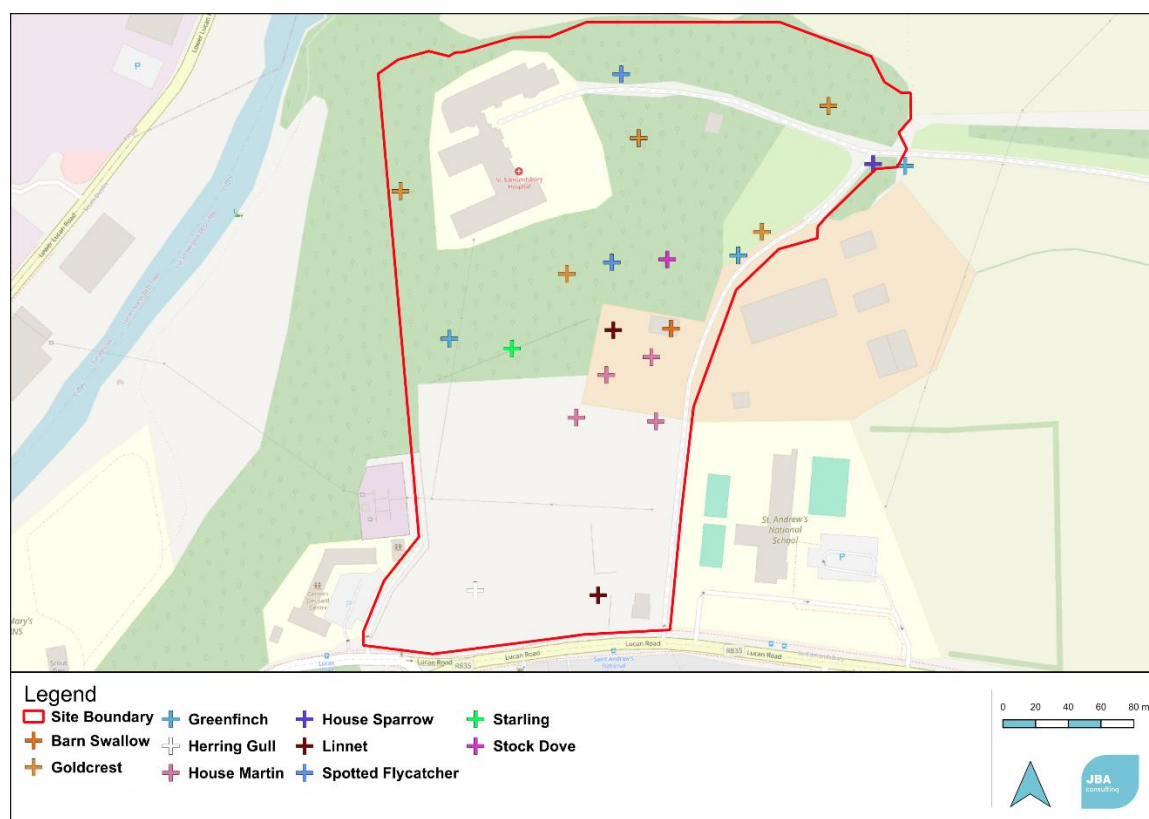


Figure 4-18: Locations of protected, SCI, and Red /Amber-listed bird species within the site

Additionally, JBA have conducted bird surveys within lands 1km to the west of the proposed site during March 2026, adding to the supplementary desktop data for breeding bird species present in the locality. The surveyed lands closely mirror the proposed site and its surrounds, i.e., mixed

woodland, arable crop fields, pastoral / meadow grassland, hedgerows and drainage ditches. Additional breeding bird species recorded within 1km of the site, that are not already listed above, include Woodcock *Scolopax rusticola*; Cormorant; Kingfisher; Mallard *Anas platyrhynchos*; Yellowhammer *Emberiza citrinella*; Reed Bunting *Emberiza schoeniclus*; Snipe; Grey Wagtail *Motacilla cinerea*; Grey Heron *Ardea cinerea*; Moorhen *Gallinula chloropus*; Meadow Pipit *Anthus pratensis*; Crossbill *Loxia curvirostra*; and Skylark *Alauda arvensis*. Of the above Woodcock, Yellowhammer; Snipe; Grey Wagtail; and Meadow Pipit are Red-listed, while Skylark, Kingfisher, Cormorant and Mallard are Amber-listed for their breeding populations.

Further local desktop data, i.e., recent NBDC records, highlight the presence of other breeding bird species not previously listed, including Golden Plover, Whooper Swan *Cygnus cygnus*, Coot *Fulica atra*, Pochard *Aythya ferina*, Teal, Tufted Duck *Aythya fuligula*, Wigeon, Snipe, Gadwall *Mareca strepera*, Goosander *Mergus merganser*, Lapwing *Vanellus vanellus*, Black-headed Gull, Lesser Black-backed Gull, Redshank, Mute Swan *Cygnus olor*, and Common Gull within 2km of the proposed site, with 14 of the above species recorded within or are highly likely to occur within the site's 500m disturbance buffer.

Table 4-9 below displays a summary of protected / Annex / SCI / Red-or Amber-listed breeding bird populations observed on-site, local NBDC data and local JBA desktop data from 2026.

Table 4-9: Other protected / Annex / SCI / Red-or Amber-listed breeding birds within the Zol

Bird Species	Annex	SCI Species	Breeding (B) & Breeding / Wintering (B/W)	Source
Golden Plover	I, II, III	✓	Red (B/W)	NBDC
Whooper Swan	I	-	Amber (B/W)	NBDC
Mallard	II, III	-	Amber (B/W)	JBA & NBDC
Coot	II, III	-	Amber (B/W)	NBDC
Yellowhammer	-	-	Red (B)	JBA & NBDC
Pochard	II, III	-	Red (B/W)	NBDC
Teal	II, III	✓	Amber (B/W)	NBDC
Tufted Duck	II, III	-	Amber (B/W)	NBDC
Wigeon	II, III	-	Amber (B/W)	NBDC
Snipe	II, III	-	Red (B/W)	JBA & NBDC
Gadwall	II, III	-	Amber (B/W)	NBDC
Goosander	II	-	Amber (B)	NBDC
Lapwing	II	-	Red (B/W)	NBDC
Black-headed Gull	-	✓	Amber (B/W)	JBA & NBDC
Grey Wagtail	-	-	Red (B)	JBA & NBDC
Common Gull	-	✓	Amber (B/W)	NBDC
Lesser Black-backed Gull	-	✓	Amber (B/W)	NBDC
Meadow Pipit	-	-	Red (B)	JBA & NBDC
Mute Swan	-	-	Amber (B/W)	NBDC
Redshank	-	✓	Red (B/W)	NBDC
Skylark	-	-	Amber (B)	JBA & NBDC
Kingfisher	I	-	Amber (B)	JBA & NBDC
Cormorant	-	✓	Amber (B/W)	JBA & NBDC
Woodcock	II, III	-	Red (B)	JBA

The woodland, scrub, hedgerows, treelines and old farmyard buildings of the proposed site offer suitable nesting habitat for breeding birds, with at least 20 confirmed active nests present during

the summer of 2023 and at least 17 active nests in 2025 (building elevations may have obscured additional nests not visible from the ground).

The proposed site is considered to be of high local ecological importance for the local breeding bird species, given its capacity to support both foraging and nesting activities.

4.4.5 Wintering Birds

Surveyors incidentally observed Herring Gull within the pastoral grassland during the initial ecological walkover during the winter of 2023. This gull species is Amber-listed for both breeding and wintering populations in Ireland.

While no protected and/or red-listed terrestrial invertebrate species were recorded on-site, during the ecological surveys; recent NBDC records highlight the presence of winter migrants such as Golden Plover, Whooper Swan, Mallard, Coot, Northern Pintail, Pochard, Teal, Tufted Duck, Wigeon, Snipe, Gadwall, Lapwing, Black-headed Gull, Brambling *Fringilla montifringilla*, Lesser Black-backed Gull, Redwing, Redshank, Mute Swan, and Common Gull within 2km of the proposed site, with 13 of the above species recorded within or are highly likely to occur within the site's 500m disturbance buffer.

Additionally, JBA have conducted wintering bird surveys within lands 1km to the west of the proposed site during 2026, adding to the supplementary desktop data for the locality. The surveyed lands closely mirror the proposed site and its surrounds, i.e., mixed woodland, arable crop fields, pastoral / meadow grassland, hedgerows and drainage ditches.

Table 4-10 below displays a summary of protected / Annex / SCI / Red- or Amber-listed wintering bird species observed on-site, local NBDC data and local JBA desktop data from 2026.

Table 4-10: Other protected / Annex / SCI / Red-or Amber-listed wintering birds within the ZoI

Bird Species	Annex	SCI Species	Wintering (W) & Breeding / Wintering (B/W)	Source
Golden Plover	I, II, III	✓	Red (B/W)	NBDC
Whooper Swan	I	-	Amber (B/W)	NBDC
Mallard	II, III	-	Amber (B/W)	JBA & NBDC
Coot	II, III	-	Amber (B/W)	NBDC
Northern Pintail	II, III	✓	Amber (W)	NBDC
Pochard	II, III	-	Red (B/W)	NBDC
Teal	II, III	✓	Amber (B/W)	NBDC
Tufted Duck	II, III	-	Amber (B/W)	NBDC
Wigeon	II, III	✓	Amber (B/W)	NBDC
Snipe	II, III	-	Red (B/W)	JBA & NBDC
Gadwall	II, III	-	Amber (B/W)	NBDC
Lapwing	II	-	Red (B/W)	NBDC
Black-headed Gull	-	✓	Amber (B/W)	JBA & NBDC
Brambling	-	-	Amber (W)	NBDC
Common Gull	-	✓	Amber (B/W)	NBDC
Lesser Black-backed Gull	-	✓	Amber (B/W)	NBDC
Redwing	-	-	Red (W)	JBA & NBDC
Mute Swan	-	-	Amber (B/W)	NBDC
Redshank	-	✓	Red (B/W)	NBDC
Cormorant	-	✓	Amber (B/W)	JBA & NBDC

The proposed site is considered to be of high local ecological importance for migrant wintering bird populations, given its capacity to support provide foraging and sheltered roosting during the winter months.

4.4.6 Reptiles

There was no evidence of Common Lizard *Zootoca vivipara* (listed under the Wildlife Acts 1976-2021, the Wildlife (Amendment) Act 2023) habitation within the proposed site. The site does not currently provide the optimal habitats required to sustain a regularly occurring Common Lizard population. Furthermore, there are no records of Common Lizard within 5km of the proposed site.

The proposed site is considered to be of less than local ecological importance for Common Lizard, given the species' absence from the locality.

4.4.7 Amphibians

There was no evidence of amphibian species listed under the Wildlife Acts 1976-2021, the Wildlife (Amendment) Act 2023 or the EU Habitats Directive recorded by the JBA Ecologists during the ecological walkover survey. However, both Common Frog *Rana temporaria* and Smooth Newt *Lissotriton vulgaris* have been recorded within NBDC within 2km of the site in the last 10 years. The site of the proposed development does not contain any breeding habitat but does provide ample foraging and hibernation habitats for both species.

The proposed site is considered to be of high local ecological importance for the local amphibian species, given its capacity to support both foraging and hibernation activities.

4.4.8 Fish

The drainage ditch within the site was not suitable to support any fish species. However, surveyors noted that drainage ditch section further downstream of the site would be suitable for juvenile glass European Eel. Additionally, Atlantic Salmon and Lamprey spp. have been recorded by IFI (Lucan Bridge - 2014) within the stretch of the River Liffey adjacent to the proposed development. This sampling survey also highlighted the presence of Brown Trout *Salmo trutta*; Gudgeon *Gobio gobio*; Minnow *Phoxinus phoxinus*; Stone Loach *Barbatula barbatula*; and the invasive Roach *Rutilus rutilus*.

The proposed site is considered to be of county level ecological importance for Atlantic Salmon, Lamprey spp. and European Eel; and high local ecological importance for the other native fish populations not afforded international protections, given their respective position within the local food chain.

4.4.9 Terrestrial Invertebrates

A total of ten terrestrial invertebrate species were recorded on-site, namely Small Tortoiseshell, Speckled Wood, Peppered Moth; White-tailed Bumblebee, Buff-tailed Bumblebee, Common Carder-bee; European Dronefly; Common Wasp; Azure Damselfly, and Banded Demoiselle, all of which are Green-listed species. While no protected and/or Red-listed terrestrial invertebrate species were recorded on-site during the ecological surveys; recent NBDC records highlight the presence of local populations of three Red-listed species, namely Moss Carder Bee *Bombus muscouri* ('Near threatened'); Large Red-tailed *Bombus lapidarius* ('Near threatened'); and Chimney Sweep moth *Odezia atrata* ('Vulnerable'). Habitats present on-site are capable of supporting the above Red-listed species, and will therefore, be considered within the impact assessment.

The proposed site is considered to be of high local ecological importance for the local terrestrial invertebrate populations, given its capacity to support both foraging and nesting / hive-building activities of local terrestrial invertebrate populations, including three Red-listed species.

4.4.10 Invasive Non-native Species

Certain invasive non-native animals and flora are listed under First Schedule of the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024) and the Commission Implementing Regulation (EU) 2025/1422 update. This makes it an offence to release, plant them in the wild or cause them to disperse, spread or otherwise cause them to grow. If these species occur on a site proposed for development or other work which may disturb the ground, control of these species is likely to be required.

European Council's Regulation on the prevention and management of the introduction and spread of invasive alien species [2025/1422] sets out to prevent, minimise and mitigate the adverse impacts of the introduction and spread, both intentional and unintentional, of invasive alien species on biodiversity and the related ecosystem services as well as on human health and the economy.

Table 4-11 below provides a list of INNS recorded within the proposed site. It includes species, their level of impact, and whether they are listed on the First Schedule of S.I. No. 374/2024 - European Union (Invasive Alien Species) Regulations 2024 and the Commission Implementing Regulation (EU) 2025/1422 update.

Table 4-11: INNS recorded within or adjacent to the proposed development's boundary

Invasive Non-Native Species	Impact	Regulation S.I. 374/2024
Sycamore	Medium	No
Cherry Laurel	High	No
Butterfly-bush	Medium	No
Rock Cotoneaster	Medium	No
Milkflower Cotoneaster	Medium	No

4.4.11 Ecological Receptors Considered for Further Assessment

The designated sites and other key ecological receptors identified during the desktop study and ecological surveys, that were deemed to require further examination within the impact assessment section, are listed in Table 4-12. Designated sites and ecological receptors that have been excluded from further examination are also listed in the below table, along with the reasoning for their exclusion.

Table 4-12: Summary of key ecological receptors requiring impact assessment

Key Ecological Receptors	Valuation	Rationale for Inclusion / Exclusion
North Dublin Bay SAC [000206]	International	Excluded: Screened out for potential impacts within Screening for Appropriate Assessment report (JBA, 2026).
North Bull Island SPA [004006]	International	Excluded: Screened out for potential impacts within Screening for Appropriate Assessment report (JBA, 2026).
South Dublin Bay SAC [000210]	International	Excluded: Screened out for potential impacts within Screening for Appropriate Assessment report (JBA, 2026).
South Dublin Bay and River Tolka Estuary SPA [004024]	International	Excluded: Screened out for potential impacts within Screening for Appropriate Assessment report (JBA, 2026).
North-West Irish Sea SPA [004236]	International	Excluded: Screened out for potential impacts within Screening for Appropriate Assessment report (JBA, 2026).
Liffey Valley pNHA [000128]	National	Included: Present within the proposed site and the footprint of the development.

Key Ecological Receptors	Valuation	Rationale for Inclusion / Exclusion
		Highly vulnerable to impacts.
Dolphins, Dublin Docks pNHA [000201]	National	Excluded: Screened out for potential impacts within Screening for Appropriate Assessment report under the South Dublin Bay and River Tolka Estuary SPA (JBA, 2026).
North Dublin Bay pNHA [000206]	National	Excluded: Screened out for potential impacts within Screening for Appropriate Assessment report under the North Dublin Bay SAC; North Bull Island SPA; and South Dublin Bay and River Tolka Estuary SPA (JBA, 2026).
South Dublin Bay pNHA [(000210]	National	Excluded: Screened out for potential impacts within Screening for Appropriate Assessment report under the South Dublin Bay and River Tolka Estuary SPA (JBA, 2026).
Stone walls and other stonework	High Local	Included: Valuation rationale and present within development's Zol
Buildings and artificial surfaces	High Local	Included: Valuation rationale and present within development's Zol
Mosaic: Spoil and bare ground / Dry meadows and grassy verges	Low Local	Included: Valuation rationale and present within development's Zol
Mosaic: Recolonising bare ground / Scrub	High Local	Included: Valuation rationale and present within development's Zol
Drainage ditches	High Local	Included: Hydrological link to the River Liffey; Valuation rationale; and present within development's Zol
Amenity grassland (improved)	Low Local	Included: Valuation rationale and present within development's Zol
Mosaic: Improved agricultural grassland / Dry meadow and grassy verges	High Local	Included: Valuation rationale and present within development's Zol
Dry meadow and grassy verges	High Local	Included: Valuation rationale and present within development's Zol
(Mixed) broadleaved woodland	High Local	Included: Valuation rationale and present within development's Zol
Mixed broadleaved / conifer woodland	High Local	Included: Valuation rationale and present within development's Zol

Key Ecological Receptors	Valuation	Rationale for Inclusion / Exclusion
Hedgerows	High Local	Included: Valuation rationale and present within development's Zol
Treelines	High Local	Included: Valuation rationale and present within development's Zol
Scattered trees and parkland	Low Local	Included: Valuation rationale and present within development's Zol
Scrub	High Local	Included: Valuation rationale and present within development's Zol
Protected Flora - Hairy St John's Wort	National	Included: Valuation rationale and present within development's Zol
Non-volant Mammals - Otter - Badger - Hedgehog and Pine Marten	National County High Local	Included: Valuation rationale and present within development's Zol
Bats	County	Included: Valuation rationale and present within development's Zol
Breeding Birds	High Local	Included: Valuation rationale and present within development's Zol
Wintering Birds	High Local	Included: Valuation rationale and present within development's Zol
Amphibians	High Local	Included: Valuation rationale and present within development's Zol
Fish	County / High Local	Included: Valuation rationale and present within development's Zol
Terrestrial Invertebrates	High Local	Included: Valuation rationale and present within development's Zol
Invasive Non-native Species	N/A	Included: Must be examined for impact assessment on KERs and mitigation purposes (biosecurity)

4.5 Potential Impact of the Proposed Development

4.5.1 Introduction

The potential impacts on the valued designated sites and ecological features, i.e. KERs, are assessed within this section. The initial assessment considers the potential impact pathways and whether these apply to the ecological features. The impact assessment considers the construction and operational stages of the proposed development and the predicted effects in the absence of

any mitigation. The descriptive terminology used to describe the characteristics (effects and significance) of these impacts is based on the terms provided within the EPA Guidelines (EPA, 2022).

4.5.2 Do Nothing Impact Scenario

If the proposed development were not to go ahead and the present land management continues as is, the ecological value of the site would remain largely unchanged given that the majority of the site's areas are currently under the management of the applicant.

There are large areas within the development's boundaries which do not undergo regular maintenance. These areas contain recolonising bare ground, dry meadow and scrub habitats. In the short-term, the recolonising areas will develop into dry meadow habitat, while the dry meadows will develop into scrub, and scrub into immature woodland where tree species are present.

Overall, these minor changes to the habitats within the proposed development's boundaries will result in slight positive impacts for specific faunal groups including:

- Non-volant Mammals – increased scrub cover provides more refuges for local mammals;
- Breeding Birds – increased scrub cover provides increased nesting opportunities for local birds; and
- Terrestrial Invertebrates – an increase in dry meadow cover will provide increased foraging opportunities for local terrestrial invertebrates and subsequently their predators (birds & bats).

However, the prevalence of invasive species throughout the site, including pNHA woodland would likely increase without wide-scale removal and subsequent management across the site.

The above scenario does not account for the other permitted or pending local developments.

4.5.3 Construction Phase

4.5.3.1 Designated Sites

Liffey Valley pNHA [National]

Given that the Liffey Valley pNHA is present within the development area, it is susceptible to potential adverse impacts via all impact pathways, i.e., surface water, groundwater, groundwater-to-surface water, land (physical loss and disturbance) and air (dust, chemical, and disturbance).

Following a surface water or groundwater to surface water pollution event, the north-eastern drainage ditch has the potential to transport pollutants (e.g. hydrocarbons) downstream to other sections of the Liffey Valley pNHA. Potential direct impacts include the degradation of overall water quality as a result of hydrocarbon and/or solvent pollution, which have the potential to adversely affect protected fish species associated within the River Liffey, namely Atlantic Salmon, Lamprey spp., and European Eel; as well as those that consume these fish, i.e., Otter and Cormorant. Hydrocarbon pollutants are also known to degrade the plumage of bird species associated with the pNHA, such as Kingfisher and Grey Wagtail. Moreover, water pollution impacts have the potential to indirectly impact pNHA associated bird and mammal species by negatively impacting the populations of lower trophic levels of the food chain e.g. floral and freshwater invertebrate species. In addition, the consumption of food items containing polluting elements will impact the health of mammal and bird populations.

The unintended introduction of sediment, via surface water run-off or dust settlement, has the potential to degrade the water quality of the site's drainage ditch and the River Liffey, including the other local sections of the pNHA. There are a range of aquatic flora, protected fish species and aquatic invertebrate groups associated with the pNHA, that will be vulnerable to excessive nutrient-based pollution (eutrophication) generated through the introduction of sediment, bound with nitrogen and phosphorus. Furthermore, regarding salmonid and lamprey species, excessive siltation can notably impact the quality of spawning grounds, which can have knock-on adverse effects on local population dynamics within the River Liffey downstream of the site.

A small section of mixed pNHA woodland habitat is set to be developed into artificial surfaces, resulting in irreversible permanent habitat loss during the construction phase (Figure 4-19). As part of the mitigation the woodland soil that is associated with this section of the pNHA is to be

relocated. However, this will not be within the existing footprint of the pNHA and therefore will result in the permanent loss of an area of woodland habitat associated with the Liffey Valley pNHA.

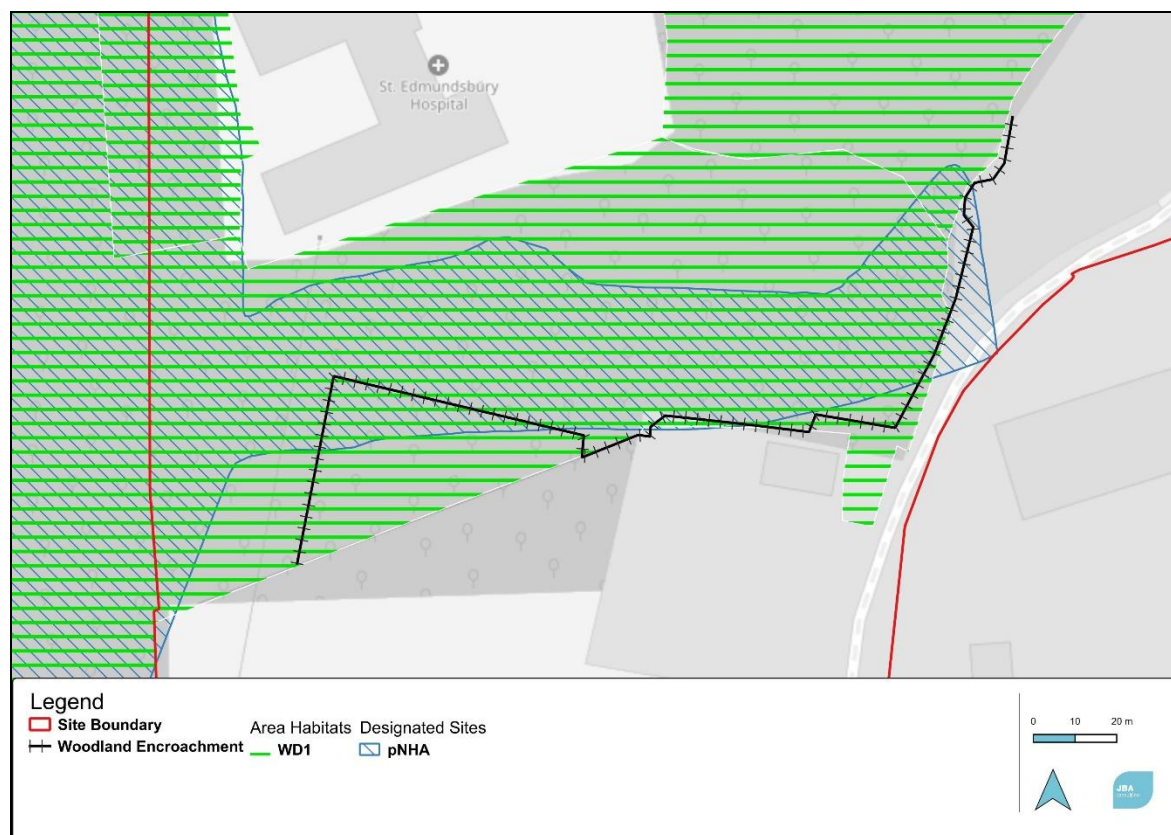


Figure 4-19: Encroachment of proposed works into pNHA woodland habitat

The retained mixed broadleaved woodland habitat adjacent to this development area will be exposed to a range of potentially adverse impacts generated by construction activities. Negative impacts will arise in scenarios where the accidental spillage of deleterious substances comes into direct contact with and negatively impacts the physiological health of trees and associated understorey flora; as well as seeping into the sub-surface / groundwater, which will degrade the root systems of the woodland flora. This impact may be slightly buffered by the woodland's existing mycelium network, if particular species such as Dryad's Saddle are present, which has been shown to bioremediate lead, chromium, nickel, magnesium, copper, iron, cadmium and mercury (Demirbaş, 2002; and Wuyep et al. 2007), heavy metals present in hydrocarbon fuel and solvents. However, not all species are capable of bioremediation, nor pollution-tolerant, so as a whole, the mycelium network will suffer, making it less capable of providing nutrients to the roots of adjacent trees, leading to malnutrition. Malnutrition of saplings and other immature trees is very problematic as the malnutrition impact is compounded by the presence of faster growing invasive species, such as Cherry Laurel, which quickly overshade and further stunt the natural succession of young trees within the pNHA woodland. Such impacts will lower the overall health and biodiversity value of the retained section of pNHA woodland.

Additionally, the pNHA woodland ground flora; root systems of the woodland trees; and the mycelium hyphae (microscopic fungal threads) network will be at risk of compaction degradation via heavy-machinery operations and parking. Furthermore, machinery used near to the trees in the broadleaved woodland habitat has the potential to result in the accidental breakage of sapling trunks and the damaging of tree limbs and trunk bark, degrading the overall health of an affected tree, and leaving it vulnerable to decay / infection. And as previously mentioned, any damage to the existing mycelium network will have knock-on malnutrition impacts on the pNHA's tree species.

The construction works will generate dust-based pollutants (e.g. cement-based dust), which have the potential to settle within the local drainage ditch and the Liffey Valley pNHA section located

within and north of the site. During long dry periods dust can coat plant foliage adversely affecting photosynthesis and other biological functions. Furthermore, cement-based dust deposited on leaves can increase the surface alkalinity, which in turn can hydrolyse lipid and wax components, penetrate the cuticle, and denature proteins, finally causing the leaves to wilt. The Hairy St John's-wort population [Flora Protection Order (2022)], located 75m west of the site boundary, has the potential to be adversely impacted by the above dust impact.

Furthermore, were the pNHA associated macrophytes (floating, emergent and aquatic flora) impacted in this manner, it will likely have knock-on impacts for protected bird species, particularly herbivorous species, which are supported by these macrophytes. Moreover, cement-based dust has the potential to be accidentally ingested by local riparian bird species when foraging and preening, when present within the air pollution buffer. Additionally, alkaline cement-based dusts have the potential to affect the pH levels, potentially impacting pH-sensitive aquatic macrophytes and aquatic fauna.

Increased vehicular presence adjacent to the local waterbodies will lead to local increases in nitrogen oxides (NO_x) potential resulting in the minor acidification / change of pH of the surface water network. Research has detailed how freshwater fish species have shown diminished abilities to respond to damage-released chemical alarm cues from other fish of the same species under weakly acidic conditions. This group of fish species includes Three-spined Stickleback (Peterson et al., 1989) and Atlantic Salmon (Leduc et al., 2010), which will potentially suffer an increased mortality predation rate within the River Liffey downstream, in the event that the local drainage ditch becomes slightly acidic (pH~ 6.0) during the construction stage. A short-term negative impact is predicted from potential impact of acidification of local surface water network. Additionally, acidification / low pH levels in combination with high metal concentrations, which can be introduced to the surface waterbody via a hydrocarbon or solvent spill, have the potential to increase the mortality of River Lamprey eggs and newly emerged larvae (Myllynen et al., 1997; and Lucas et al., 2021). The potential acidification of the drainage ditches has the potential to cause knock-on acidification impacts for the Liffey Valley pNHA downstream.

The above negative impacts that affect terrestrial flora, acting either alone, in a cumulative manner or in-combination, have the potential to result in the degradation and death of trees, understorey floral, and riparian species within the pNHA woodland, ultimately resulting in the fragmentation of this highly important woodland wildlife corridor, which currently provides dense understorey refuge and canopy cover.

Moreover, the potential spread of invasive non-native floral species, in particular Cherry Laurel, from its current locations along the woodland edge, will result in the displacement of native species via shading impacts and higher rates of colonisation within areas of open and/or disturbed ground.

The Liffey Valley pNHA is vulnerable to the direct physical impact of its associated fauna, with accidental physical disturbance impacts, resulting in injury and potential fatalities (e.g. road collision between Badger and site vehicle).

Therefore, in the absence of mitigation during the construction phase it is predicted that there will be a range of temporary to permanent adverse impacts of moderate significance for the Liffey Valley pNHA.

4.5.3.2 Habitats

Stone walls and other stonework [High Local]

The stone wall habitats across the southern extent of the development site (i.e., the Walled Garden, Boundary Wall with Bell Tower and Stone Boundary Walls and Associated Entrance Structures to the south) will undergo both temporary and long-term habitat loss and/or degradation, in respect to ecology, during the construction phase. Sections of the garden wall structures will be removed where required to facilitate the development, including parts of the north and east walls. Other sections will be incorporated into the internal structure / finish of the proposed main hospital building, such as Bell Tower and wall sections either side, so while the stone wall structure is intact, it has now been excluded from the external environment. Alterations to the Stone Boundary Wall along Lucan Road will see it temporarily removed and then relocated further within the site, setting it further back from the existing road and pedestrian infrastructure.

The proposed incorporation and alteration work includes the repairing of deteriorated fabric and the removal of inappropriate modern alterations where necessary, with repairs to masonry and external

finishes utilising compatible materials and traditional techniques, including the use of lime-based mortars and renders where appropriate. Such repairs will ultimately remove the ecological value from the targeted area, through the removal of stone wall flora and infilling of potential bird-nesting or bat-roosting mortar cavities between bricks, as well as the infilling of smaller bore-like holes within the stone / bricks that potentially support mining bee and solitary bee species.

The retained stone wall habitats may still be potentially degraded from accident damage to walls by hand or machinery during adjacent construction works. Such damage has the potential to damage and/or remove the floral species, bird nests and potential bat roost features established within the crevices and gaps within the stone wall habitats.

Additionally, these stone wall flora have the potential to be negatively impacted by dust-based pollution during construction activities, with cement-based dusts being of particular concern given their ability to degrade the epidermis layer of floral species, which may lead to a reduction in floral cover and/or the suppression of more sensitive species, resulting in an overall decrease in habitat condition.

Therefore, in absence of mitigation during the construction phase, a long-term adverse impact of slight significance is anticipated for the stone wall habitats.

Buildings and artificial surfaces [High Local]

A series of demolitions, alterations and refurbishment work is proposed for the building structures within the site, which will result in both habitat loss and habitat degradation. Works to St. Edmundsbury House will include façade remediation at the point where the existing ward building connects to the protected structure. The ward itself is set to be demolished and reconstructed. Within the historic farmyard enclosure, the proposed development construction will refurbish, alter and change the use of the coach house building (operational consultancy suite and coffee shop) and the stable block (operational maintenance facility building and office accommodation). Additional construction phase works within this area include the demolition of an existing shed and the construction of a new energy centre building, together with associated service structures including a secure bicycle store. The construction phase will also result in the demolition of the other ancillary sheds and buildings within the farmyard enclosure; the historic farm building located south-east of the bell tower; and other ancillary sheds and buildings within the walled garden areas.

The proposed incorporation and alteration work includes the repairing of deteriorated fabric and the removal of inappropriate modern alterations where necessary, with repairs to masonry and external finishes utilising compatible materials and traditional techniques, including the use of lime-based mortars and renders where appropriate. These repairs will ultimately remove the ecological value from the targeted areas amongst the buildings, through the removal of external stone wall flora and infilling of potential bird-nesting or bat-roosting mortar cavities, as well as the infilling of smaller bore-like holes within the stone / bricks that potentially support mining bees and solitary bee species.

The retained sections of the historic buildings on-site may still be potentially degraded from accident damage to external walls by hand or machinery during adjacent enabling, construction and/or demolition works. Such damage has the potential to physically degrade and/or remove the floral species, bird nests and potential bat roost features established within the crevices and gaps within the stone wall habitats.

Additionally, the retained buildings' external stone wall flora have the potential to be adversely impacted by dust pollution during construction activities, with cement-based dusts being of particular concern given their ability to degrade the epidermis layer of floral species, which may lead to a reduction in floral cover, resulting in an overall decrease in habitat condition and function.

Therefore, in absence of mitigation during the construction phase, a long-term adverse impact of slight significance is anticipated for these structural habitats.

Mosaic: Spoil and bare ground / Dry meadows and grassy verges [Low Local]

The mosaiced spoil and bare ground and dry meadow habitat will be entirely lost during the construction phase as the area will be cleared for the proposed development, including establishment of the main development's southern structure, as well as pedestrian infrastructure and private garden area.

Therefore, in the absence of mitigation during the construction stage, a long-term profound negative impact is anticipated for this habitat.

Mosaic: Recolonising bare ground / Scrub [High Local]

The mosaiced recolonising bare ground and scrub habitat will also be lost in its entirety during the construction phase as the area will be cleared for the proposed development, including establishment of the main development's southern structure, as well as pedestrian infrastructure and bike parking.

Therefore, in the absence of mitigation during the construction stage, a long-term profound negative impact is anticipated for this habitat.

Drainage ditches [High Local]

The drainage ditch within the site will potentially be exposed to a range of construction emissions via surface water, groundwater and air-based pollutant pathways.

The unintended introduction of pollutants (e.g. hydrocarbon, solvents and cement leachate) and excess sediment into the drainage ditch have the potential to notably degrade its water quality conditions, as well as influencing its pH levels (beyond its normal range), with knock-on impacts for local flora and fauna within the ditch, including the downstream section that flows into the River Liffey.

Furthermore, this drainage ditch may also experience similar polluting impacts through the groundwater-to-surface water pollution pathway given the underlying aquifer's characteristics. Groundwater-to-surface water pollution events have the potential to negatively impact the water quality of the ditch. Therefore, there is the potential for groundwater-to-surface water impacts for the drainage ditch habitat.

Moreover, this drainage ditch has the potential to be impacted by dust-based pollution during the construction phase, with cement-based dusts degrading the structures of epidermal cells of the associated ditch flora, damaging instream (downstream) and bankside flora. Also, alkaline cement-based dusts have the potential to affect the drainage ditches' pH levels, potentially harming pH-sensitive aquatic flora and fauna downstream.

Additionally, the accidental introduction of sediment, via surface water run-off or dust settlement, has the potential to degrade the water quality of this aquatic habitat. There is a range of aquatic flora and fauna groups downstream of the site's drainage ditch, that will be vulnerable to excessive nutrient-based pollution (eutrophication), generated through the introduction of sediment, bound with nitrogen and phosphorus.

Therefore, in the absence of mitigation during the construction phase, it is predicted that there will be a short-term negative impact of moderate significance for the drainage ditch habitats.

Amenity grassland (improved) [Low Local]

The proposed development's pedestrian walkways, roadways, structures, courtyards and formation of new natural habitat types, will result in the loss of approximately 65% loss in total cover (dependent on habitat encroachment from neighbouring habitats) during the construction phase. The creation of grasscrete parking areas within the northern and southern development areas will see the return of similar amenity grassland floral assemblages to the site, though highly fragmented in structure, allowing for a minor increase in this habitat's total area. More notably, the walled garden in the southern development area will have new amenity grassland areas present. The construction phase's later stage will see this habitat emerging relatively quickly (season alignment dependent), though it will lack the floral density of the existing amenity grassland to be removed.

The amenity grassland to be retained adjacent to the existing hospital buildings will still be subjected to numerous potential impacts along the surface water, groundwater, land and air pathways. In respect to surface water / groundwater pollution, the accidental spillage of deleterious substances (e.g. hydrocarbons and solvents), has the potential to come into direct contact with and adversely impact the physiological condition of amenity grassland flora; as well as penetrating into the sub-surface / groundwater and degrading the grassland flora's root systems, resulting in further degradation and the potential death of less resilient species, therefore, decreasing the overall health and ecological value of the grassland.

Moreover, the retained amenity grassland has the potential to be physically damaged from excessive footfall from workers present on-site, compaction from construction machinery and temporary material stock-piling. Such damage to the grassland may result in an increased frequency of disturbed bare ground within the grassland habitat, which in turn has the potential to result in the establishment of invasive species present within the locality (e.g. Butterfly-bush).

Furthermore, the remaining amenity grassland also has the potential to be negatively impacted by dust pollution during the construction of the development, with cement-based dusts degrading the epidermis layers of flora, damaging vital photosynthesis structures, while natural (earth) dust settlement will also likely lead to negative impacts of grassland flora by simply coating the appendages responsible for photosynthesis, blocking sunlight required for the process.

Therefore, in absence of mitigation during the construction phase, a long-term adverse impact of slight significance is anticipated for the amenity grassland habitat.

Mosaic: Improved agricultural grassland / Dry meadow and grassy verges [High Local]

The proposed development's pedestrian walkways, roadways, parking areas, structures, courtyards and formation of new natural habitat types, will result in the loss of approximately 95% loss in total cover (dependent on habitat succession within the site). Towards the latter stages of the construction phase, the landscaping of a few new dry meadow strips around the new hospital building to the south, will begin to establish themselves within the location of the existing mosaic grassland; however, the addition of these meadow strips is insignificant in terms of the increased total of habitat area present within the site during the construction phase.

The retained segments along the site's western boundary will still be vulnerable to numerous impact pathways (surface water, groundwater, land and air) during the construction phase. In regard to surface water pollution, the accidental spillage of harmful substances (e.g. hydrocarbons and solvents), have the potential to come into direct contact with and adversely impact the physiological condition of grassland flora; as well as penetrating into the sub-surface / groundwater and degrading the grassland flora's root systems, resulting in further degradation and the potential death of less resilient species, therefore, decreasing the overall health and ecological value of these grassland segments.

Furthermore, the retained mosaic grassland segments have the potential to be physically damaged from excessive footfall from workers present on-site, compaction from construction machinery and temporary material stock-piling. Such damage to the grassland segments may result in an increased frequency of disturbed bare ground within the grassland habitat, which in turn has the potential to result in the establishment of invasive species present within the locality (e.g. Butterfly-bush).

Additionally, the remaining mosaic grassland sections also have the potential to be negatively impacted by dust pollution during the construction phase, with cement-based dusts degrading the epidermis layers of flora, damaging vital photosynthesis structures, while natural (earth) dust settlement will also likely lead to negative impacts of meadow flora by simply coating the appendages responsible for photosynthesis, blocking sunlight required for the process.

Therefore, in absence of mitigation during the construction phase, a very significant long-term adverse impact is anticipated for the agricultural grassland and dry meadow mosaic.

Dry meadow and grassy verges [High Local]

As a result of the proposed development's pedestrian walkways, roadways, parking areas and formation of new habitat types, the existing dry meadow and grassy verges habitats will experience an approximate 60% loss in total cover (percentage range dependent on habitat succession within the site). However, towards the latter stages of the construction phase, the landscaping of new dry meadow strips across much of the site, including the green roofs, will begin to establish, although these newly emerging meadows will not initially match the floral diversity and structural complexity of those currently present (e.g. will lack the growth length and density to provide suitable hive-building conditions for the local White-tailed Bumblebee population).

The retained dry meadow in the north-east and there will still be vulnerable to an array of potentially damaging impacts generated by construction activities. The accidental spillages of harmful substances (e.g. hydrocarbons and solvents), have the potential to come into direct contact with and negatively impact the physiological health of dry meadow flora; as well as

penetrating into the sub-surface / groundwater and degrading the grassland flora's root systems, resulting in further degradation and the potential death of less resilient species, thus lowering overall health and biodiversity value of this retained meadow habitat.

Additionally, the retained dry meadow has the potential to be physically damaged from excessive footfall from workers present on-site, compaction from light and heavy machinery and temporary material stock-piling. Such damage to the meadow may result in an increased frequency of disturbed bare ground within the grassland habitat, which in turn has the potential to result in the establishment of invasive species present within the locality (e.g. Butterfly-bush).

Moreover, the remaining dry meadow habitat also has the potential to be impacted by dust-based pollution during the construction phase, with cement-based dusts degrading the epidermis layers of flora, damaging vital photosynthesis structures, while natural (earth) dust settlement will also likely lead to negative impacts of meadow flora by simply coating the appendages responsible for photosynthesis, blocking direct sunlight exposure.

Therefore, in absence of mitigation during the construction phase, a long-term adverse impact of moderate significance is anticipated for the dry meadow habitat.

(Mixed) broadleaved woodland [National]

The mixed broadleaved woodland habitats (pNHA and non-pNHA sections) will be vulnerable to potential adverse impacts via all impact pathways, i.e., surface water, groundwater, land (physical loss and degradation) and air (dust and chemical), given their proximity to the development.

A small section of mixed pNHA woodland habitat is set to be developed into artificial surfaces, resulting in irreversible permanent habitat loss during the construction phase. As part of the mitigation for this loss sections of the woodland soil and flora will be translocated; this will be carried out prior to the construction stage beginning due to the complexity of translocating woodland soil. Translocating the soil will try to preserve the mycelium network and seedbank present within this habitat. This should allow for a quicker establishment of a similar mixed broadleaf woodland in the donor site than from natural succession, due to the slow dispersal of woodland ground flora. Introducing the seedbank from an existing woodland will skip this requirement for seed dispersal to the donation site. Within the soil the mycelium and root network of the woodland flora will still be present after the translocation, retaining this mycelium network will allow for symbiotic relationships between fungal and tree populations to establish quicker within the new woodland section. However, woodland structure, humidity, and symbiotic relationships can take decades to properly establish given the requirement of the mature trees and shrub to create the environmental conditions of the existing mature woodland (Fuentes Mountemayor et al., 2021).

The retained mixed broadleaved woodland habitat (both pNHA and non-pNHA woodland) adjacent to this development area will be exposed to a range of potentially adverse impacts generated by construction activities, including surface water / groundwater table pollution events. Negative impacts will arise in scenarios where the accidental spillage of deleterious substances comes into direct contact with and negatively impacts the physiological health of trees and associated understorey flora; as well as seeping into the sub-surface / groundwater, which will degrade the root systems of the woodland flora. This impact may be slightly buffered by the woodland's existing mycelium network, if particular species such as Dryad's Saddle are present, which has been shown to bioremediate lead, chromium, nickel, magnesium, copper, iron, cadmium and mercury (Demirbaş, 2002; and Wuyep et al. 2007), heavy metals present in hydrocarbon fuel and solvents. However, not all species are capable of bioremediation, nor pollution-tolerant, so as a whole, the mycelium network will suffer, making it less capable of providing nutrients to the roots of adjacent trees, leading to malnutrition. Malnutrition of saplings and other immature trees is very problematic as the malnutrition impact is compounded by the presence of faster growing invasive species, such as Cherry Laurel, which quickly overshadows and further stunt the natural succession of young trees within the woodland. Such impacts will lower the overall health and biodiversity value of the retained sections of broadleaved woodland.

Additionally, the woodland ground flora; root systems of the woodland trees; and the mycelium hyphae (microscopic fungal threads) network will be at risk of compaction degradation via heavy-machinery operations and parking. Moreover, machinery used adjacent to the trees in the broadleaved woodland habitat has the potential to result in the accidental snapping of sapling trunks and the damaging of tree limbs and trunk bark, degrading the overall health of affected tree, and leaving it vulnerable to decay / infection.

The construction works will generate dust (e.g. cement-based dust), which have the potential to settle on flora from the woodland floor up to the mature tree canopy. During long dry periods dust can coat plant foliage, adversely affecting photosynthesis and other biological functions. Furthermore, cement-based dust deposited on leaves can increase the surface alkalinity, which in turn can hydrolyse lipid and wax components, penetrate the cuticle, and denature proteins, finally causing the leaves to wilt. The Hairy St John's-wort population [Flora Protection Order (2022)], located 75m west of the site boundary, has the potential to be adversely impacted by the above dust impacts.

Increased vehicular presence adjacent to the local waterbodies will lead to local increases in atmospheric nitrogen, in particular nitrogen oxides (NOx), which have the potential to decrease the prevalence of the more woodland-beneficial mycorrhizal fungi and increase the prevalence of less beneficial fungi that are more tolerant of pollution, as they can take advantage of excessive atmospheric nitrogen pollution (van der Linde et al. 2018). This shift in the fungi community composition can result in a more parasitic than symbiotic relationship, as these new mycorrhizae abstract more carbon and in return provide less nutrients to the trees connected to the network.

The above negative impacts that affect terrestrial flora, acting either alone in a cumulative manner or in-combination, have the potential to result in the degradation and death of trees and understorey flora, within the woodland, ultimately resulting in the fragmentation of this highly important woodland wildlife corridor, which currently provides dense understorey refuge and canopy cover.

Moreover, the potential spread of invasive non-native floral species via construction activities, in particular Cherry Laurel, from its current locations along the woodland edge, will result in the displacement of native species via shading impacts and higher rates of colonisation within areas of open and/or disturbed ground.

Therefore, in the absence of mitigation during the construction phase, it is predicted that there will be a range of temporary to permanent adverse impacts of moderate significance for the mixed broadleaved woodland habitat.

Mixed broadleaved / conifer woodland [High Local]

The mixed broadleaved and conifer woodland strip bordering the site will be retained in full; however, it will still be exposed to potential adverse impacts via all impact pathways, i.e., surface water, groundwater, land (physical loss and disturbance) and air (dust and chemical), given its proximity to the development.

This mixed broadleaved and conifer woodland will be exposed to a range of potentially adverse impacts generated by construction activities, including surface water / groundwater table pollution events. Negative impacts will arise in scenarios where the accidental spillage of deleterious substances runs off the adjacent road and comes into direct contact with the western extent of the woodland, negatively impacting the physiological health of trees and associated understorey flora within the affected woodland area. Such pollution events will also result in the pollutant seeping into the sub-surface / groundwater, which will degrade the root systems of the woodland flora. While surveyors did not note any fungi within this woodland strip, it may still possess a mycelium network with bioremediating species, that have the capacity to buffer the impacts of heavy metals present in hydrocarbon fuel and solvents. However, as stated in the previous woodland impact assessments, the overall mycelium network will be degraded by the pollution event, making it less capable of providing nutrients to the roots of adjacent trees, leading to malnutrition. Malnutrition of saplings and other immature trees is very problematic as the malnutrition impact is compounded by the presence of faster growing invasive species, such as Cherry Laurel, which quickly overshade and further stunt the natural succession of young trees within the woodland. Such impacts will lower the overall health and ecological value of this mixed broadleaved and conifer woodland.

Moreover, machinery working adjacent to or passing by the woodland, has the potential to result in the accidental breakage of tree limbs extending out towards the road, degrading the overall health of affected tree, and leaving it vulnerable to decay / infection. Physical root and mycelium hyphae degradation is not anticipated given the existing roadway and metal fencing (prevents off-road vehicular incursions) safeguard these subterranean networks from compaction.

The site's construction works will generate dusts, which have the potential to settle on flora from the woodland floor up to the mature tree canopy. During long dry periods dust can coat plant foliage, adversely affecting photosynthesis and other biological functions. Furthermore, cement-

based dust deposited on leaves can increase the surface alkalinity, which can hydrolyse lipid and wax components, penetrate the cuticle, and denature proteins, causing the leaves to wilt.

Increased vehicular presence adjacent to the local waterbodies will lead to local increases in atmospheric nitrogen, in particular nitrogen oxides (NOx), which have the potential to decrease the prevalence of the more woodland-beneficial mycorrhizal fungi and increase the prevalence of less beneficial fungi that are more tolerant of pollution, as they can take advantage of excessive atmospheric nitrogen pollution (van der Linde et al. 2018). This change in the fungi community composition can result in a shift away from symbiosis and towards low-level parasitism, as these new mycorrhizae abstract more carbon and in return provide less nutrients to the trees connected to the network.

The above negative impacts that affect woodland flora, acting either alone in a cumulative manner or in-combination, have the potential to result in the degradation and death of trees and understorey flora, within the woodland, ultimately resulting in the fragmentation of this woodland wildlife corridor, which currently provides dense understorey refuge and canopy cover.

Moreover, the potential further spread of invasive non-native floral species within this habitat, will be aided by one or more of the above impact scenarios, resulting in further displacement of native species via shading impacts and higher rates of colonisation within areas of open and/or disturbed ground.

Therefore, in the absence of mitigation during the construction phase, it is predicted that there will be a range of temporary to long-term adverse impacts of slight significance for the mixed broadleaved and conifer woodland habitat.

Hedgerows [High Local]

During the construction phase, the hedgerow habitat will be cleared in order to accommodate the realignment of road and pedestrian infrastructure, resulting in a complete habitat loss during the majority of the construction phase, until the landscape planting of new native hedgerows across the proposed site has been complete. By the end of the construction phase the hedgerow habitat will have increased notably in length and diversity but decreased in terms of maturity and ecosystem services provided to local fauna (e.g. established wildlife corridors with appropriate cover).

Therefore, in absence of mitigation during the construction phase, a long-term adverse impact of moderate significance is anticipated for the hedgerow habitat.

Treelines [High Local]

The treelines in north-east of the site will be retained in their entirety, while the western V-shaped treeline and south-eastern treelines will almost be removed in full, bar one to two trees per treeline, which removes the wildlife corridor element of these habitats. Towards the end of the construction phase the landscape planting will create new treeline habitat throughout much of the development, increasing the total length of treeline habitat present on-site; however, these new treelines will be immature and will not initially be able to provide the full range of ecosystem services (e.g. nesting for birds) for local faunal populations.

The existing treeline sections to be retained will be potentially subjected to degradation via surface water, groundwater, land (physical degradation) and air (dust) impact pathways. Adverse impacts can arise in scenarios where the accidental spillage of deleterious substances enters treeline habitats, negatively impacting the physiological condition of the trees and understorey flora. Such incidents will also result in the pollutant seeping into the sub-surface / groundwater, which will degrade the root systems of the tree and understorey flora, which will ultimately lower the overall condition and ecological value of these linear habitats.

Moreover, construction machinery working adjacent to or passing by these treelines, have the potential to result in accidental damage to tree limbs and trunk bark, degrading the condition of affected trees, leaving them at risk of decay / infection. Furthermore, the root systems of the trees and understorey flora will be at risk of root compaction degradation via heavy-machinery operations and parking adjacent to the treeline habitats.

Works on-site during the construction phase will generate dusts, which have the potential to settle on flora within the treeline habitats. During long dry periods, these dusts can heavily coat plant foliage, adversely affecting photosynthesis and other biological functions. In addition, when cement-based dusts are deposited on leaves, they can increase the leaves' surface alkalinity,

which can hydrolyse lipid and wax components, penetrate the cuticle, and denature the leaves' structural proteins, causing the leaves to wilt.

The above negative impacts that affect treeline flora, acting either alone in a cumulative manner or in-combination, have the potential to result in the degradation and death of trees and understorey flora, ultimately resulting in the fragmentation of these wildlife corridors, which currently provide canopy connectivity in relatively open areas.

Therefore, in absence of mitigation during the construction phase, a long-term adverse impact of slight significance is anticipated for these habitats.

Scattered trees and parkland [Low Local]

The scattered trees and parkland habitat adjacent to the existing hospital buildings will be retained in full in regard to the trees present, while a small section of the grassland will be lost to artificial surfaces and new habitat types. This habitat will also see a small increase in total area coverage within the site, following the landscaping carried out towards the end of construction phase; however, these new additions will be immature in comparison to the existing habitat, with the tree not yet mature enough to support nesting.

The existing scattered trees and parkland habitat will also be vulnerable to a number of impact pathways including surface water, groundwater, land (physical degradation) and air (dust). For instance, adverse impacts will arise in scenarios where the accidental spillage of deleterious substances enters this habitat, it will negatively impact the physiological health of trees and grassland. Such incidents will also result in the pollutant seeping into the sub-surface / groundwater, which will degrade the root systems of the tree and grassland flora, which will ultimately lower the overall condition and ecological value of this habitat.

In addition, machinery working adjacent to or passing by the trees in this habitat, have the potential to result in the accidental breakage of tree limbs, degrading the health of affected tree, leaving them at risk of decay / infection. Physical root degradation is not anticipated the trees present within this habitat.

Construction works on-site will generate dusts, which have the potential to settle on flora within this habitat. During long dry periods dust can coat plant foliage, adversely affecting photosynthesis and other biological functions. Furthermore, when cement-based dusts are deposited on leaves, they can increase the leaves' surface alkalinity, which can hydrolyse lipid and wax components, penetrate the cuticle, and denature the leaves' structural proteins, causing the leaves to wilt.

Therefore, in absence of mitigation during the construction phase, a medium-term adverse impact of slight significance is anticipated for this habitat

Scrub [High Local]

The scrub patch in the southwest corner of the site will be removed in full during the construction phase. The scrub strip bordering the eastern site boundary will have its southernmost section adjacent to the barn removed, while the scrub vegetation north of this point will be trimmed back along the boundary but will not be removed given its placement on the eastern side of the boundary fence. This partial habitat loss will only be in effect during the earlier stages of the development's construction, as the landscape planting of new native shrubs will lead to an increase in total shrub (scrub) coverage across the proposed site, as well as a slight increase in floral diversity. However, these new shrub (scrub) areas will not match the maturity of existing scrub to be cleared and will not provide a full range of scrub-based ecosystem services for local fauna.

The retained neighbouring scrub strip along the eastern boundary will also be subjected to a range of other potential negative impacts as a result of the development's construction activities, which can occur via the surface water, groundwater, and air (dust) pathways. For example, negative impacts will arise in scenarios where the accidental spillage of deleterious substances runs off the adjacent road and comes into direct contact with the western extent of the scrub flora, negatively impacting the physiological health of shrubs, young trees and other ground flora within the affected area. Pollution events of this nature will also result in the pollutant seeping into the sub-surface / groundwater, which will degrade the root systems of the scrub flora. Such impacts will lower the overall health and ecological value of this scrub habitat.

Additionally, machinery working adjacent to or passing by the woodland, has the potential to result in the accidental breakage of young tree and shrub limbs extending out towards the road (after

initial trimming works), degrading the overall health of affected tree or shrub, leaving them at risk of decay / infection. Physical root degradation is not anticipated given the existing roadway and metal fencing (prevents off-road vehicular incursions) which safeguard these subterranean networks from compaction.

The construction works on-site will generate dusts, which have the potential to settle on flora within the scrub habitat. During long dry periods dust can coat plant foliage, adversely affecting photosynthesis and other biological functions. Moreover, when cement-based dusts are deposited on leaves, they can increase the leaves' surface alkalinity, which can hydrolyse lipid and wax components, penetrate the cuticle, and denature proteins, causing the leaves to wilt.

The above adverse impacts that affect scrub flora, acting either alone in a cumulative manner or in combination, have the potential to result in the degradation and death of young trees, shrubs and other understorey flora, within the scrub, ultimately resulting in the fragmentation of this wildlife corridor, which currently provides dense understorey cover.

Moreover, the potential further spread of invasive non-native floral species, Butterfly-bush in particular, within this habitat, will be aided by one or more of the above impact scenarios, resulting in further displacement of native species via shading impacts and higher rates of colonisation within areas of open and/or disturbed ground.

Therefore, in absence of mitigation during the construction phase, a long-term adverse impact of moderate significance is anticipated for the scrub habitat on-site.

4.5.3.3 Flora

Hairy St John's-wort [National]

During long dry periods dust can coat plant foliage adversely affecting photosynthesis and other biological functions. Furthermore, cement-based dust deposited on leaves can increase the surface alkalinity, which in turn can hydrolyse lipid and wax components, penetrate the cuticle, and denature proteins, finally causing the leaves to wilt. The Hairy St John's-wort population [Flora Protection Order (2022)], located 75m west of the site boundary, has the potential to be adversely impacted by the above dust impacts.

Therefore, in absence of mitigation during the construction phase, a short-term adverse impact of moderate significance is anticipated for the scrub habitat on-site.

4.5.3.4 Fauna

Non-volant Mammals [National / County / High Local]

The local Badger, Otter, Pine Marten and Hedgehog populations will potentially be exposed to one or more of the impact pathways, i.e., surface water, groundwater, groundwater to surface water, air (dust, visual and audible disturbance) and land (physical disturbance of the individual(s) and habitat loss), which will be generated within the proposed development site during the construction phase.

All of the above mammals are at risk of potentially being adversely impacted through the direct ingestion of contaminated water during the construction phase (surface water and groundwater to surface water pathway). In the event that a mammal was to drink from a waterbody (drainage ditch, including downstream of the site), which had been accidentally contaminated with polluting substance (in particular a pollutant which floats on top of the water's surface e.g. hydrocarbons), this can potentially result in damaged lungs and/or carcinogenic effects for affected individual.

Furthermore, in the event that hydrocarbon and solvent pollutants reach the River Liffey downstream, local Otters may suffer from degraded furs, notably impacting the furs' insulative qualities as result of a disruption to fur's natural water-proofing oils and its capacity to trap warm air close to the body, resulting in physiological stress for any affected Otter. In addition, these hydrocarbons can potentially be ingested by Otters as they groom their affected fur, leading to haemorrhagic gastroenteropathy, which will likely result in Otter mortalities (Baker et al., 1981).

Additionally, groundwater and air (dust)-based pollution impacts have the potential to indirectly impact these mammal species via the deterioration in quality and population decline (availability) of prey items in their respective food webs. This impact also has a knock-on effect as the consumption of contaminated prey items may lead to bioaccumulation of toxic substances within

the local populations of these protected mammal species. Accumulation of such toxic substances is known to result in pulmonary distress in the lungs of mammals, in addition to the general carcinogenic effects.

Badger, Pine Marten and Hedgehog will be negatively impacted by short-term habitat loss during the construction of the development, as woodland, hedgerow, treeline, scrub and meadow habitats will be lost during site clearance works. This ultimately reduces the foraging, commuting, denning, and hibernation resources available on-site during the construction phase.

Adverse impacts to Badger, Pine Marten and Hedgehog may also arise in the form of visual and audible disturbance to foraging and commuting activities. Additionally, the disturbance of these three mammals may lead to potential loss of life in the case of accidents, such as accidental trappings after failure to exclude entry and/or vehicular collisions within or adjacent to the construction site.

Therefore, in the absence of mitigation during the construction phase, it is predicted that there will be a temporary to short-term negative impact of slight significance for these non-volant mammal species.

Bats [County]

The local bat species, Common Pipistrelle, Soprano Pipistrelle, Leisler's Bat and Brown Long-eared Bat (recorded on-site), as well as Daubenton's Bat and Nathusius's Pipistrelle recorded locally, will potentially be subjected to adverse impacts via the surface water, groundwater, groundwater to surface water, air (dust, visual / lighting disturbance) and land (habitat loss), which will be generated within the proposed development site during the construction phase.

Given the current absence of active bat roosts amongst the semi-mature / mature trees and artificial structures within and immediately adjacent to the proposed development, adverse impacts on current bat roosting activities are not predicted during the construction phase. However, the construction of the development will also result in the loss of a large number of potential bat roost features due to the removal of old structures and trees. This will ultimately result in a long-term loss of potential roost features on-site.

Direct and indirect impacts are likely to occur on foraging and commuting identified bat species frequenting the habitats within and adjacent to site's boundaries, as a result of the introduction of additional artificial lighting during the construction phase. Direct lighting impacts refers to compound or works areas lighting spilling into adjacent habitats that support the foraging and movements of nocturnal animals, such as the local bat species. This light spillage will cause local bats to avoid these excessively lit habitats, which effectively reduces the total habitat available to them for both foraging and commuting within and adjacent to the proposed development site. In some potential cases, such light spillage may cut-off commuting routes along linear habitat features, i.e., retained site border vegetation.

The indirect lighting impacts have the potential to arise through influencing the distribution and frequency of the local bats prey items within habitats adjacent to areas within additional construction- / compound-based lighting, resulting in a negative impact on foraging activity. As these additional lights will attract nocturnal winged-invertebrates towards them and away from the usual host habitat (van Langevelde et al., 2018), the local bat species will be left with the option to commute to new foraging grounds or pursue their prey and in turn enter the light impacted area. For some bat species who have adapted relatively well to urban landscapes, namely Common Pipistrelle, Soprano Pipistrelle and Leisler's Bat, the pursuit of prey items into light impacted areas is less impactful (Russ and Montgomery, 2002; Russ et al., 2003). Moreover, studies have shown that pipistrelle species and Leisler's Bat can congregate around urban street lighting feeding on the nocturnal winged-insects attracted to the lower impact lighting (Rydell et al., 1993, Blake et al., 1994; Stone et al., 2015; Spoelstra et al., 2015; 2017). Furthermore, recent studies have highlighted that the foraging frequency of pipistrelle species within a locality, that contains both street-lit and dark areas, is not influenced by the dimming of streetlights, regardless of the lights' output and capacity to attract prey items (Buddendorf et al. 2026). However, given that the long-term adverse impacts of higher streetlight luminance on affected invertebrate prey populations, all local bat species are ultimately negatively impacted by excessive / undimmed streetlight outputs.

Short-term habitat fragmentation / loss will occur as a result of the construction work, the foraging and commuting that the site's natural habitats currently provide will be removed during construction, reducing the foraging for local terrestrial invertebrates, therefore lowering the

available foraging for local bat populations. The removal of linear habitat features, such as the hedgerow and treelines will also impact the known commuting routes for local bats.

Additionally, and air (dust)-based construction emissions have the potential to lead to pollution impacts that will indirectly impact all local bat species via degradation of local habitats resulting in the deterioration of quality and decreased frequency of their prey items in the food chain. This impact also has a knock-on effect as the consumption of prey items containing trace pollutants may lead to bioaccumulation of toxic substances within the local bat populations, resulting in physiological stress and potential reduced fecundity.

Therefore, in the absence of mitigation during the construction phase, a long-term adverse impact of moderate significance is anticipated for the local bat populations.

Breeding Birds [High Local]

The local breeding bird populations will potentially be subjected to a series of construction-based impact emissions (surface water, groundwater and air-based (e.g. dust, visual and noise) pollutants and land-take (habitat loss), which will be generated / occur within the proposed development site.

Local breeding birds will experience a significant reduction in current and potential nesting sites as a result of the removal of nest-hosting structures; meadow and scrub vegetation clearance; and tree felling required to allow for the construction of the development. A total of 15 local breeding bird species (i.e. Linnet; Greenfinch; House Sparrow; Barn Swallow; Barn Owl; Starling; Goldcrest; House Martin; Spotted Flycatcher; Stock Dove; Yellowhammer; Woodcock; Meadow Pipit; Skylark; and Wood Pigeon) which are protected (Annex) and/or of conservation concern (Amber-listed and Red-listed), will have their preferred nesting habitats negatively impacted (notably reduced) as result of the temporary and/or permanent loss of meadow; hedgerow; treeline; scrub; and woodland. The other 23 Green-listed breeding bird species recorded within or adjacent to the boundaries of the site will also be impacted from the habitat loss outlined above. Ultimately, 38 local breeding bird populations will experience a short-term to long-term loss of potential nesting sites as a result of the construction activities.

Furthermore, large areas of foraging, refuge and commuting habitat will also be lost during construction. This will severely reduce the available resources for local breeding bird populations, which is likely to make the site unsuitable for the bird species that are more strongly associated with artificial structure, hedgerow, scrub and meadow habitats. As the majority of the woodland habitat will be retained, this will allow for woodland associated breeding bird populations to continue to utilise the site's temporarily reduced woodland cover for foraging, nesting and commuting purposes.

Additionally, habitat loss and the general deterioration of retained habitats through surface water, groundwater or air-based pollutants have the potential to reduce and/or degrade the foraging grounds of local breeding bird species. The degradation of floral species in these habitats has the potential to negatively impact seed- and frugivorous or fruit/berry-eating protected bird species (e.g., Stock Dove), which will be adversely impacted if pollutant-affected flora are unable to produce these reproductive products or only produce low-quality and/or below average quantities of these food sources. A number of omnivorous bird species of conservation concern will also be negatively impact by both of the above scenarios, such as Starling and Linnet.

The temporary and long-term habitat loss, as well as potential habitat degradation, have the potential to result in habitat fragmentation within the site. Potential degradation of habitats to be retained, through direct physical or pollutant-based impacts, also has the potential to increase the degree of fragmentation and loss. While the level of fragmentation in regard to movement / distance travelled is within acceptable range for standard commuting purposes for the local breeding bird species, the lack of cover / refuge is problematic for any bird species which can be hunted by local predators, such as Buzzard and Sparrowhawk *Accipiter nisus* (both Green-listed species), thus increasing the likelihood of being predated and reducing the local populations of breeding bird species of conservation concern. The potential loss of juvenile and/or adult birds of conservation concern will result in short-term impact for local breeding bird species.

All local breeding bird species are at risk of potentially being adversely impacted through the direct ingestion of contaminated water during the construction phase. In the event that a bird was to enter a temporary waterbody (e.g. settlement pond, localised flood depression), which had been accidentally contaminated with a polluting substance (in particular a pollutant which floats on top of the water's surface e.g. hydrocarbons), the bird may consume water from the upper (polluted)

layers of the water column. The consumption of such water can potentially result in reduced egg production and hatching; increased clutch or brood abandonment; reduced growth and increased organ weights (Albers, 2006).

Moreover, surface water, groundwater, and air (dust)-based pollution impacts have the potential to indirectly impact breeding bird species via the deterioration of food / prey items in the food chain for the local bird species. This impact also has a knock-on effect as the consumption of prey items containing polluting elements may lead to bioaccumulation of toxic substances within the local breeding bird populations (Costa et al., 2013; Idan and Jazza, 2022; and Ding et al., 2023).

In addition, breeding birds that utilise the site for commuting or foraging purposes may also be visually and/or audibly disturbed by the construction works and workers entering /exiting the works area, causing these breeding bird species to vacate the site during active work periods. Furthermore, the clearance of vegetation within and adjacent to the works area will increase local breeding bird species alert distances as there will be less vegetation available for refuge (Fernández-Juricic et al., 2001).

Also, noise generated by the construction works has the potential to effect egg production, incubation, brooding, predators, brood parasites, and abandonment, as well as the ability to find or attract a mate and the ability of parents to hear and respond to begging calls of their offspring. Any bird species that regularly experience fright-flight responses or failure to attract mates and defend territories (Slabbekoorn and Ripmeester, 2008) as a result of the excessive noise, will likely suffer from decreased fecundity of their local respective populations (Ortega, 2012). Given the projected length of the construction phase, a temporary to short-term disturbance impact is predicted for local breeding bird populations.

Therefore, in the absence of mitigation during the construction phase, a long-term negative impact of moderate significance is anticipated for the resident and migrant breeding bird populations.

Wintering Birds [High Local]

The wintering bird populations will potentially be exposed to a range of construction-based impact emissions (surface water, groundwater and air-based (e.g. dust, visual and noise) pollutants and land-take (habitat loss), which will occur during the construction phase.

The majority of the meadow and scrub vegetation that potentially acts as ground cover for wintering birds is to be removed during construction; this will make the site less suitable for species, such as Snipe. In addition, the felling of trees within the hedgerow, treeline and woodland habitats will reduce the preferred habitats of wintering Redwing, as well as Woodcock in respect to woodland loss. Furthermore, surface water, groundwater or air-based pollutants have the potential to reduce and/or degrade the retained foraging and roosting grounds for wintering bird populations.

In the event that hydrocarbon pollutants are accidentally introduced into the local surface water and groundwater (surface water recharge) networks, wintering bird species may come in contact with the substance whilst navigating, drinking from, foraging in or washing within a wetland or waterbody downstream of the site, resulting in degraded feathers, which will notably impact their feathers' insulative qualities, resulting in physiological stress for any affected individuals. Furthermore, these hydrocarbons can potentially be ingested by bird species as they preen their affected feathers, leading to further physiological stress.

Wintering birds are at risk of potentially being adversely impacted through the direct ingestion of contaminated water during the construction works. If a wintering bird were to drink from a temporary waterbody which had been accidentally contaminated with a polluting substance (in particular a pollutant which floats on top of the water's surface e.g. hydrocarbons), the bird will likely consume water from the upper (polluted) layers of the water column. The consumption of such water can potentially result in reduced egg production and hatching; increased clutch or brood abandonment; reduced growth and increased organ weights (Albers, 2006).

Moreover, surface water, groundwater, and air (dust)-based pollution impacts have the potential to indirectly impact wintering bird species via the deterioration of food / prey items. This impact also has a knock-on effect as the consumption of prey items containing polluting elements may lead to bioaccumulation of toxic substances within the insectivorous and omnivorous wintering bird populations.

The vegetation associated with wintering bird species, that is to be retained, will still be present within the bird disturbance zone during the construction phase. In the event, that wintering birds, such as Woodcock and/or Redwing, attempt to utilise these habitats during the works, individuals will likely vacate the site as result of physical, visual and/or noise disturbance. These impacts in combination are enough to consider the site no longer viable for Woodcock during the construction phase, as this species is particularly sensitive to disturbance.

Therefore, in the absence of mitigation measures during the construction phase, a long-term adverse impact of slight significance is predicted for the resident and migratory wintering bird populations.

Amphibians [High Local]

The local Common Frog and Smooth Newt populations will potentially be subjected to a series of construction-based impacts via surface water, groundwater, groundwater to surface water, air-based (e.g. dust, visual and noise) and land (habitat loss) pathways.

Amphibians are at risk of being adversely impacted through the direct osmotic absorption of contaminated water during the construction works. If a Common Frog or Smooth Newt were to enter a temporary waterbody (attenuation pond or localised flood depression) which had been accidentally contaminated with a deleterious substance, the individual will naturally absorb trace amounts of this toxin via its osmotic skin membrane, leading to physiological distress.

Moreover, surface water, groundwater, and air (dust)-based pollution impacts have the potential to indirectly impact breeding bird species via the deterioration of prey items in the food chain for the local amphibians. This impact also has a knock-on effect as the consumption of prey items containing polluting elements may lead to bioaccumulation of toxic substances within the local Common Frog and Smooth Newt populations.

The local amphibians may be subjected to disturbance, through the physical disturbance of hibernation habitat, i.e., the removal of wood/detritus piles and/or tree trunks from the woodland floor, which may fatally injure individuals, or expose them to cold extremes during the winter period, which may also prove fatal. General site activities also have the potential to disturb them whilst they are foraging and commuting within the site's retained habitats, as well as habitats adjacent to the site. Furthermore, there is also the potential for loss of life via vehicular collisions when amphibians are commuting across active site routes. They may also be accidentally trapped within excavations or materials, after failure to exclude entry, which can also lead to injury or death.

Additionally, the clearance of amphibian-supporting habitats that offer refuge within the site, creates an increased risk for local amphibians to predation from local predators, e.g. raptor species, or accidental trampling by construction vehicles or workers.

Therefore, in the absence of mitigation measures during the construction phase, a long-term adverse impact of slight significance is predicted for the local amphibian populations.

Fish [County / High Local]

For local fish populations downstream of the site, adverse impacts may arise during the construction in the form of accidental introduction of pollutants, such as hydrocarbons, or excessive sediment into the local surface water network (i.e. drainage ditch and River Liffey downstream). Such uncontrolled discharges into drainage ditch have the potential to directly impact fish species through substance toxicity or in the case of sediment input, the degradation of spawning habitat downstream. These polluting events also have the potential to indirectly impact local fish species through the depletion and/or degradation of the invertebrate trophic level (food supply).

In a scenario where hydrocarbons, solvents or lubricants have been accidentally introduced into a waterbody, the heavy metals within these substances have the potential to pass through the gills of local fish species. These metals may also enter fish through their digestive tract via ingestion of metal accumulated prey items. Metals such as cadmium, chromium, nickel, arsenic, copper, mercury, lead and zinc are the most notable metals that cause severe toxicity in fish species. The exposure to these metals results in the development of oxidative stress by affected fish, which weakens the immune system, causing tissue and organ degradation, as well as growth defects and a reduced fecundity (Garai et al., 2021). The longevity of this type of impact will vary depending on the quantity of the pollutant entering the waterbody. Therefore, in the absence of mitigation

measures, it is predicted that metal toxicity impacts have the potential to result in temporary to medium-term adverse impacts for local fish species.

Increased vehicular presence adjacent to the local waterbodies will lead to local increases in nitrogen oxides (NOx) potentially resulting in the minor acidification / change of pH of the surface water network. Research has detailed how freshwater fish species have shown diminished abilities to respond to damage-released chemical alarm cues from other fish of the same species under weakly acidic conditions. This group of fish species includes Three-spined Stickleback (Peterson et al., 1989) and Atlantic Salmon (Leduc et al., 2010), which will likely suffer an increased mortality predation rate within the River Liffey downstream (Atlantic Salmon), in the event that the drainage ditch becomes slightly acidic (pH~ 6.0) during the construction phase. A short-term negative impact is predicted from potential impact of acidification of local surface water network. Additionally, acidification / low pH levels in combination high metal concentrations, which can be introduced to the surface waterbody via a hydrocarbon or solvent spill, have the potential to increase the mortality of River Lamprey eggs and newly emerged larvae (Myllynen et al., 1997; and Lucas et al., 2021) within the River Liffey downstream.

Therefore, in the absence of mitigation during the construction phase, it is predicted that there will be temporary to short-term adverse impacts ranging from slight (Brown Trout, Minnow, Gudgeon, Stone Loach and Three-spined Stickleback) to moderate (Atlantic Salmon, lamprey spp. and European Eel) significance for these fish species.

Terrestrial Invertebrates [High Local]

In the event that construction-based environmental pollutants are accidentally introduced, via surface water, groundwater and air (dust) pathways, into the habitats present within and adjacent to the site, local terrestrial invertebrates' foraging resources may be notably degraded, potentially reducing their quality and frequency of occurrence within the affected habitat(s). Furthermore, a number of invertebrate groups (e.g. Lumbricina – earthworms) are known to bioaccumulate pollutants within the soils of these polluted habitats, damaging their physiological health, as well as introducing the toxin into the lowest trophic level of the local food web, with knock-on impacts to predators such as Badger and Woodcock.

Additionally, negative impacts may arise for local terrestrial invertebrates in the form of physical disturbance to foraging and commuting activities within retained habitats on-site during the construction phase.

The proposed site will experience short- to long-term habitat loss and fragmentation, which will notably reduce the total habitat available for foraging and hive formation for tree-based hives, dense-grass tussock hives and subterranean hives. This will adversely impact the local bee populations, such as White-tailed Bumblebee and Common Carder-bee. Additionally, the loss of these grassland habitats will reduce the total available host plants for butterfly species laying their eggs, with species such as Speckled Wood having their reproductive cycle negatively impacted.

Therefore, in the absence of mitigation during the construction phase, it is predicted that there will be a temporary to long-term adverse impact of slight significance for these terrestrial invertebrate species.

4.5.3.5 Invasive Non-native Species

Five INNS (Cherry Laurel, Butterfly-bush, Milkflower Cotoneaster, Rock Cotoneaster and Sycamore) are present in the mixed woodland that is within the footprint of the proposed development's construction layout. Therefore, there is a risk of the works causing further spread of these species within the woodland, and into other adjacent habitats. There is also a risk of plant material or seeds getting stuck on machinery and transferred to other areas of the site, with the Butterfly-bush seeds the most likely to spread across the site and into new previously uninfected areas.

Biosecurity mitigation measures will need to be in place to avoid contamination and further spread of invasive non-native species, leading to increased impacts across the site's operational habitats.

4.5.4 Operational Phase

4.5.4.1 Designated Sites

Liffey Valley pNHA [National]

The Liffey Valley pNHA will be subject to operational surface water (via local surface water drainage infrastructure outflow) and groundwater (proposed attenuation/ infiltration tanks) emissions from the proposed development. Within the newly proposed main hospital's drainage layout there will be a series of SuDS elements installed, including permeable paving, grasscrete parking, green roofs, and bioswales. There will also be two underground attenuation / infiltration tanks (Stormtech MC3500 Detention/Infiltration System) and a Klargestor Class 1 NSBE003 petrol interceptor within the system, downstream of the natural SuDS elements. The above SuDS features, attenuation / infiltration tanks and petrol interceptor will collectively provide surface water run-off attenuation, infiltration, and in-situ retention of sediments (and associated nutrients), metals, and hydrocarbons (Jurries, 2003; Anderson et al., 2016), before they exit the site via the existing surface water infrastructure located south of the site, at the site access location.

The proposed development and the required utility channel for the southern section, which will extend five metres from the building, will encroach on the Liffey Valley pNHA. Part of the woodland associated with Liffey Valley pNHA will be cleared and become an artificial building and surfaces, this will result in a permanent alteration of the Liffey Valley pNHA, reducing the overall woodland cover of the pNHA by roughly 1500m².

The building for the proposed development will not allow for any natural regeneration of the woodland within the pNHA boundaries, as well as the required clearance and maintenance of a 5m buffer around the proposed building for the utility drains and building maintenance. Maintenance of the building will include clearing of gutters, fixing the roof, painting, and drain clearing; resulting in an expanded area beyond the building extent to be kept clear indefinitely and not allow for the natural re-establishment of any woodland.

Within the northern section a proposed sub-station which is required for the development will be installed, this will also encroach on the woodland associated with the pNHA. This will cause a permanent loss of a small section of the woodland associated with the Liffey Valley pNHA, including the footprint of the substation as well as an area surrounding the substation which will be cleared to stop any encroachment of vegetation on the substation.

Therefore, in the absence of operational mitigations, it is predicted that there will be an irreversible permanent negative operational impact of moderate significance for the Liffey Valley pNHA and its associated KERs, given the proposed development footprint.

4.5.4.2 Habitats

Stone walls and other stonework [High Local]

The retained stone wall sections, that are not incorporated into internal design structures of the development, will support a notably reduced flora assemblage and refuge / nesting capacity for local faunal groups (bats, birds and terrestrial invertebrates). However, a newly constructed stone wall, measuring approximately 65m will be installed within the meadow strip south of the new adolescent unit, with local flora beginning to colonise the structure during the initial operational phase of the development.

Therefore, in absence of mitigation during the operational phase, an initial long-term adverse impact of slight significance impact is anticipated for these linear habitats.

Buildings and artificial surfaces [High Local]

The retained buildings on-site will support a notably reduced flora assemblage and refuge / nesting capacity for local faunal groups (bats, birds and terrestrial invertebrates); while the new buildings will have no establishment of local flora present on their structures, nor will they be capable of providing resources to any of the local faunal groups. And while the newly constructed buildings, will support SuDS green roof features, these will support meadow-aligned flora rather than stone wall flora communities.

Therefore, in absence of mitigation during the operational phase, an initial permanent adverse impact of slight significance is anticipated for these artificial habitats.

Mosaic: Spoil and bare ground / Dry meadow and gassy verges [Low Local]

This specific mosaic habitat will be cleared in full during the construction phase, and no operational habitats within the landscape plan will mirror this habitat combination, as any dry meadows present during the operational phase will be at the very least within a mosaic of recolonising bare ground and dry meadow, with no spoil or bare ground present.

Therefore, in absence of mitigation during the operational phase, **an initial long-term adverse impact of profound significance** is anticipated for this specific habitat mosaic.

Mosaic: Recolonising bare ground / Scrub [High Local]

This largely scrub-based mosaic habitat will be cleared in full during the construction phase; however, the initial operational phase of the development will see the replication of this habitat mosaic, through shrub planting (in lower density areas) within the first 1-2 years of its operations (range depends on planting timings and season the construction phase ends). After this period the recolonising element of habitat will no longer be present.

Therefore, in absence of mitigation during the operational phase, it is predicted that this mosaic habitat will experience an initial short-term adverse impact of slight significance, followed by a long-term negative impact of profound significance; bearing in mind that wholly scrub habitat will benefit in terms of operational impacts after the initial two-year period.

Drainage ditches [High Local]

The existing drainage ditch habitat will not experience any habitat loss as a result of site's operations. This drainage ditch habitat will see an increase in its total length / area within the site, through the formation of multiple swales as well as the lower (frequently wet) sections of the small bioretention basins (which will not possess the capacity to qualify as small ponds) within the site. These will provide and support a subsection of the ecological services and floral composition of a fully established drainage ditch habitat.

In regard to operational emissions, groundwater and air operational emissions are not predicted to negatively impact the new drainage ditch habitats. However, given that the site drainage ditches are incorporated into the operational surface water design as SuDS features, this role within the system has the potential to result in periods of sub-optimal water quality within these drainage ditch-like habitats; however, the proposed floral species within these habitats have been chosen for their pollution tolerant and bioremediation characteristics.

Therefore, in absence of mitigation during the operational phase, an initial long-term positive impact of slight significance is anticipated for drainage ditch habitat.

Amenity grassland (improved) [Low Local]

The amenity grassland. i.e., the retained sections to the north, the highly fragmented grasscrete areas and the highly maintained grassland within the walled garden area, will see a very slight increase to its total area across the site. The new amenity grassland areas will also be the only habitats to achieve near full maturity, in respect to flora diversity and ecosystem functions within the initial operational phase of development.

To manage the surface water run-off from hardstanding areas within the proposed development, a series of SuDS features are proposed including permeable paving; green roofs, grasscrete, swales; and bioretention basins, which will collectively provide surface water run-off attenuation, infiltration, and in-situ retention of sediments (and associated nutrients), metals, and hydrocarbons (Jurries, 2003; Anderson et al., 2016). These SuDS features will ensure that localised flooding during heavy rainfall events does not lead to habitats, such as the retained and new formed amenity grasslands, being subjected to potentially harmful urban run-off.

Therefore, in absence of mitigation during the operational phase, an initial long-term positive impact that is not significant is anticipated for the amenity grassland habitat.

Mosaic: Improved agricultural grassland / Dry meadow and grassy verges [High Local]

During the initial operational phase, the retained segments of this pastoral and meadow mosaic along the site's western boundary will bring its transition into an exclusively dry meadow habitat, through the proposed landscape maintenance, resulting in grass dominant sections becoming more florally diverse through the increased frequency in forbs within these sections. This will take

approximately 2 years of landscape management during operations. After this period the improved agricultural grassland element of the mosaic habitat will no longer be present.

Therefore, in absence of mitigation during the operational phase, it is predicted that this mosaic habitat will experience an initial short-term significant adverse impact, followed by a long-term negative impact of profound significance for improved agricultural grassland mosaic element; while the dry meadow habitat will experience an initial long-term positive impact that is not significant (the same impact significance as non-mosaic dry meadow habitat below).

Dry meadow and grassy verges [High Local]

During the initial operational phase, the dry meadow habitat will see a minor increase to its total area within the site, through retention of existing dry meadows and the formation of new meadows within the northern and southern development areas, including short-sward, green roof meadows.

To manage the surface water run-off from hardstanding areas within the proposed development, a range of SuDS features are proposed including permeable paving; green roofs, grasscrete, swales; and bioretention basins, which will collectively provide surface water run-off attenuation, infiltration, and in-situ retention of sediments (and associated nutrients), metals, and hydrocarbons (Jurries, 2003; Anderson et al., 2016). As this SuDS arrangement includes the meadow green roofs, it is important to state that the green roofs' role is largely water attenuation, as opposed to retention and filtration of pollutants; and therefore, will not be degraded by its role within the operational SuDS. The proposed SuDS will ensure that localised flooding during heavy rainfall events does not lead to habitats, such as the retained and new formed dry meadows, being subjected to potentially harmful urban run-off on-site.

Therefore, in absence of mitigation during the operational phase, an initial long-term positive impact, that is not significant, is anticipated for dry meadow and grassy verges within the site.

(Mixed) broadleaved woodland [National]

As part of the landscape plan for the proposed development, a section of woodland is to be created that will offset the loss experienced during the construction phase. This new woodland will be adjacent to the existing woodland, ensuring that habitat fragmentation is kept to a minimal. However, this woodland will be immature in comparison to the woodland that is being removed to facilitate the proposed development. This will include not having the complex mycelium network that are usually present within mature woodlands. Given time to mature it is possible that the new area of woodland will replace the existing area of woodland that is to be removed; however, the woodland structure which influence environmental conditions of woodlands can take decades to form (Fuentes-Montemayor et al., 2021).

The woodland which is to remain intact adjacent to the proposed development will be impacted by the lighting from the new development, which will encroach on the edge of this habitat, potentially impacting nocturnal fauna that utilise this habitat. However, the density of the woodland will ensure that no lighting reaches far into the woodland, ensuring dark corridors and habitats remain for fauna within the woodland habitat. This will ultimately have a negligible impact on the bat and nocturnal fauna populations within the woodland.

The installation of hard surfaces and buildings increases the risk of surface water run-off pollution events, either from diffuse pollutants from everyday use such as traffic, or from potential flooding of the area introducing deleterious pollutants accumulated within the hardstanding areas into the woodland habitats. To manage the surface water run-off from hardstanding areas within the site, a series of SuDS features are proposed including permeable paving; green roofs, grasscrete, swales; and bioretention basins, which will collectively provide surface water run-off attenuation, infiltration, and in-situ retention of sediments (and associated nutrients), metals, and hydrocarbons (Jurries, 2003; Anderson et al., 2016). The proposed SuDS, the swales in particular, will help ensure that localised flooding during heavy rainfall events does not lead to operational habitats, such as the mixed broadleaved woodland, which contains the pNHA woodland, being exposed to potentially deleterious urban run-off from the site's hard surfaces.

Therefore, in absence of mitigation during the operational phase, an initial permanent negative impact, of moderate significance, is anticipated for the mixed broadleaved woodland habitat within this site.

Mixed broadleaved / conifer woodland [High Local]

This site-bordering mixed woodland habitat is being retained in full and will also receive a small linear addition to the western edge in the form of native hedgerow planting, which will increase the floral diversity; and improve the native vs. non-native / invasive ratio in terms of total cover. However, it must be noted that the planted hedgerow will still be in its infancy during the initial operational phase, so its addition to cover / canopy and woodland ecological functions will be very limited.

To manage the surface water run-off from hardstanding areas such as the roadway adjacent to this woodland, a series of SuDS features are proposed including permeable paving; green roofs, grasscrete, swales; and bioretention basins, which will collectively provide surface water run-off attenuation, infiltration, and in-situ retention of sediments (and associated nutrients), metals, and hydrocarbons (Jurries, 2003; Anderson et al., 2016). The proposed SuDS, the swales and bioretention basins in particular, will help ensure that localised flooding during heavy rainfall events does not lead to operational habitats, such as this mixed broadleaved and conifer woodland, being exposed to potentially damaging urban run-off from the site's hard surfaces.

Therefore, in absence of mitigation during the operational phase, an initial long-term positive impact, that is not significant, is anticipated for this mixed broadleaved and conifer woodland.

Hedgerows [High Local]

As previous stated, by the end of the construction phase the hedgerow habitat will have increased notably in length and diversity but decreased in terms of maturity and ecosystem services provided to local fauna; and that will still largely be the case during the initial operational phase of the development. During the first couple years of site operations, these young hedgerows will reach a level of maturity which will provide foraging, refuge and sheltered commuting for fauna but will still lack the structural capacity to provide bird nesting and hive-building opportunities.

In order to manage the surface water run-off from hardstanding areas, a series of SuDS features are proposed including permeable paving; green roofs, grasscrete, swales; and bioretention basins, which will collectively provide surface water run-off attenuation, infiltration, and in-situ retention of sediments (and associated nutrients), metals, and hydrocarbons (Jurries, 2003; Anderson et al., 2016). The proposed SuDS will ensure that localised flooding during heavy rainfall events does not lead to operational habitats, such as these young hedgerows being exposed to potentially damaging urban run-off from the site's artificial surfaces.

Therefore, in absence of mitigation during the operational phase, an initial long-term positive impact that is not significant is anticipated for the hedgerow habitats on-site.

Treelines [High Local]

As previous stated, by the end of the construction phase the planted treelines will have increased notably in total length and diversity but decreased in terms of maturity and ecosystem services provided to local fauna; and that will still largely be the case during the initial operational phase of the development. During the first couple years of operations, these new treelines will reach a level of maturity which will help provide foraging, refuge and sheltered commuting for fauna but will still lack the structural capacity to provide potential bat roosting, bird nesting and hive-building opportunities.

The site's surface water run-off from hardstanding areas will be managed by a series of SuDS features, which include permeable paving; green roofs, grasscrete, swales; and bioretention basins, which will collectively provide surface water run-off attenuation, infiltration, and in-situ retention of sediments (and associated nutrients), metals, and hydrocarbons (Jurries, 2003; Anderson et al., 2016). The proposed SuDS will ensure that localised flooding during heavy rainfall events does not lead to operational habitats, such as these immature treelines being exposed to potentially deleterious urban run-off from the site's artificial surfaces.

Therefore, in absence of mitigation during the operational phase, an initial long-term positive impact that is not significant is anticipated for the site's treeline habitats.

Scattered trees and parkland [Low Local]

The scattered trees and parkland habitat will also see a small increase in total area coverage within the site during the initial operational phase; however, these new additions will still be immature in

comparison to the existing habitat, with the new trees not yet mature enough to support potential bat roosting, bird nesting and hive-building opportunities.

The site's surface water run-off from hardstanding areas will be managed by a series of SuDS features, which include permeable paving; green roofs, grasscrete, swales; and bioretention basins, which will collectively provide surface water run-off attenuation, infiltration, and in-situ retention of sediments (and associated nutrients), metals, and hydrocarbons (Jurries, 2003; Anderson et al., 2016). The proposed SuDS will ensure that localised flooding during heavy rainfall events does not lead to the parkland and trees being exposed to potentially damaging urban run-off from the site's hardstanding surfaces.

Therefore, in absence of mitigation during the operational phase, an initial long-term positive impact that is not significant is anticipated for the scattered tree and parkland habitat.

Scrub [High Local]

During the initial operational phase, the partial loss of scrub habitat will have been offset by the landscape planting of new native shrubbery, leading to an increase in total shrub (scrub) coverage across the proposed site, as well as a slight increase in floral diversity. However, these new shrub areas will not yet match the maturity of the site's existing scrub and will not provide a full range of scrub-based ecosystem services for local fauna, such as nesting for more disturbance sensitive bird species.

The site's surface water run-off from hardstanding areas will be managed by a series of SuDS features, which include permeable paving; green roofs, grasscrete, swales; and bioretention basins, which will collectively provide surface water run-off attenuation, infiltration, and in-situ retention of sediments (and associated nutrients), metals, and hydrocarbons (Jurries, 2003; Anderson et al., 2016). The proposed SuDS will ensure that localised flooding during heavy rainfall events does not lead to shrub (scrub) habitats being exposed to potentially deleterious urban run-off from the site's artificial surfaces.

Therefore, in absence of mitigation during the operational phase, an initial long-term positive impact, that is not significant, is anticipated for the shrub (scrub) habitat on-site.

4.5.4.3 Flora

Hairy St John's-wort [National]

During the operational phase the small population of Hairy St John's-wort will not be subjected to any operational emissions given that the development will not lead to increased foot-traffic in its locality; with the site's main thoroughfare located along the eastern site boundary and operating in south-north pedestrian traffic, with a specific intention to tie in with future walking routes planned for Liffey Valley Park, that is to be located north of the site.

Therefore, in absence of mitigation during the operational phase, an initial long-term neutral impact, that is not significant, is anticipated for local Hairy St John's-wort population.

4.5.4.4 Fauna

Non-volant Mammals [National / County / High Local]

- Otter

In respect to the local Otter population within the River Liffey, the proposed development's main operational emission of concern is the surface water run-off from hardstanding areas within the proximity of the site's existing drainage ditch to the northeast. However, the site's surface water run-off from hardstanding areas will be managed by a series of SuDS features, which include permeable paving; green roofs, grasscrete, swales; and bioretention basins, which will collectively provide surface water run-off attenuation, infiltration, and in-situ retention of sediments (and associated nutrients), metals, and hydrocarbons (Jurries, 2003; Anderson et al., 2016). The proposed SuDS will ensure that localised flooding during heavy rainfall events directs surface water flows away from the existing drainage ditch safeguarding the River Liffey Otter population downstream.

While Otter does not currently frequent the site, the creation of a pond in the north-east of the site, adjacent to the existing drainage ditch, has the potential to attract Otter upstream during springtime to hunt spawning Common Frog congregations, which provide a low effort - high reward resource. This scenario is not particularly common in cases where the aquatic pathway to the pond does not support fish but has been observed on two occasions by JBA Ecologists as part of an on-going mammal monitoring project in Fingal. While this ecological predator-prey scenario would be a positive for the site's ecology and ecosystem functioning as a whole, it does bring with it a very small risk of road accident collisions between Otter and operational traffic from dusk till dawn, during the early spring to early summer period. Therefore, the road collision risk for Otter during the site's operations remains very low, given probability of Otter presence and low vehicular speed limits on-site.

Therefore, in the absence of mitigation during the operational phase of the development, the local Otter population is anticipated to experience an initial long-term neutral impact, that is not significant.

- Badger, Pine Marten, Hedgehog

The site's Badger population, mainly frequents the woodlands, in particular the northern boundary section. Therefore the local Badger family will not be notably impacted by the increased operational activity of the site, which will largely be centred around the new main hospital campus to the south of the site. As the northern wing of main hospital campus intrudes into the pNHA woodland area, where Badger activity has previously been noted, the outward facing rooms with windows into the woodland, have the potential to generate lighting disturbance impacts on local Badger when they are utilising this section of woodland. The above operational disturbances are also relevant for the local Pine Marten and Hedgehog populations, with the site's woodland present within the territories of at least one individual of each species. The increased vehicular presence during operations will bring with it a slight increase to the likelihood of road accident collisions between these three mammals and operational traffic from dusk till dawn year-round. Pine Marten collisions risk is increased during the summer period as individuals become more active during the day at this time of year, which results in another minor increase in collision likelihood as vehicular traffic will be higher during diurnal periods. Overall, the risk of vehicular collision is still relatively low given the low-speed limits for vehicles within the site.

Both Badger and Hedgehog will experience habitat loss and fragmentation during the operational phase, given the increased frequency of artificial surfaces as a whole across the site, and particularly in areas that were once open meadow / recolonising areas (accessible earthworm foraging) or scrub with high-level berry yields, i.e., Bramble and Elder scrub. Furthermore, green spaces present around the main hospital campus will not be attractive to Badger given their proximity to the hospital operations. These areas will still likely be frequented by Hedgehog given that the ground planting along the edges of these green areas will provide enough cover for Hedgehogs to forage unseen. As the mature woodland structure within the site will remain unchanged, habitat loss is not a factor for the local Pine Marten population.

In regard to condition of operational habitats, the site's surface water run-off from hardstanding areas will be managed by a series of SuDS features (mitigation-by-design elements), which include permeable paving; green roofs, grasscrete, swales; bioretention basins and pond, which will collectively provide surface water run-off attenuation, infiltration, and in-situ retention of sediments (and associated nutrients), metals, and hydrocarbons (Jurries, 2003; Anderson et al., 2016). The proposed SuDS will ensure that localised flooding during heavy rainfall events does not lead to the degradation of the operational habitats that will support the resources for the local Badger, Pine Marten and Hedgehog populations.

Therefore, in the absence of mitigation during the operational phase of the development, the local Pine Marten population is anticipated to experience an initial long-term negative impact, that is not significant; while Badger and Hedgehog populations are predicted to experience an initial long-term negative impact of slight significance.

Bats [County]

The site's construction phase will see the demolishing and refurbishing of buildings and stone walls, as well as the felling of a number of mature trees, resulting in a loss of a high number of potential bat roost features during the site's initial operational phase. The above works will result in a long-term negative impact for the local Common Pipistrelle, Soprano Pipistrelle, Nathusius's

Pipistrelle, Leisler's Bat and Brown Long-eared Bat populations during the initial operational phase. The local Daubenton's Bat population is not anticipated to be impacted by this loss given their roosting preferences for structures and trees within the riparian zone of rivers.

The operational landscape design will have both positive and negative aspects for local bat foraging and commuting activities. The creation of the new habitat types, such as the pond and the wetland swale / bioretention basin habitats, will increase the diversity of invertebrate prey items available for local bats to hunt. Furthermore, existing habitat types, such as the dry meadows and treelines, will see their floral communities diversify, giving them the capacity to support a greater range of terrestrial invertebrate prey species. However, the increased frequency of artificial surface and lighting on-site will have long-term impacts on total invertebrate abundance on-site so, while there will be a greater diversity of prey, the abundance of prey items in total will likely slightly decrease on-site, particularly within the initial operational phase when habitats are immature and are yet to be fully colonised by invertebrate species.

For local bats, habitat fragmentation will still be present as the landscaping, i.e., hedgerows, treelines and meadows (including green roofs), continues to establish and mature within the site during the initial operational phase. This also means that the capacity of the hedgerows and treelines to act as commuting landmarks within the landscape will also be sub-optimal.

Despite a progressive bat-friendly lighting design (mitigation-by-design element), lighting impacts are still likely to affect the foraging and commuting of local bat species frequenting the habitats within and adjacent to site's boundaries, as a result of the introduction of additional artificial lighting during the operational phase. Light spillage will cause local bats to avoid these illuminated habitats, which effectively reduces the total habitat available to them for both foraging and commuting within the proposed development site, e.g. the lit parking areas and associated planting, within the immediate vicinity of the luminaires. New lamppost locations and the main hospital lighting will also result in the bottle-necking of dark corridors along the eastern and western boundaries in the southern half of the site.

The indirect lighting impacts have the potential to arise through influencing the distribution and frequency of the local bats prey items within habitats adjacent to the proposed development such as the woodland habitat between the two sections of the site. Lighting, from the proposed development may result in a negative impact on foraging activity, these additional lights will attract nocturnal winged-invertebrates towards them and away from the usual host habitat (van Langevelde et al., 2018), the local bat species will be left with the option to commute to new foraging grounds or pursue their prey and in turn enter the light impacted area. For some bat species that have adapted relatively well to urban landscapes, namely Common Pipistrelle, Soprano Pipistrelle and Leisler's Bat, the pursuit of prey items into light impacted areas is less impactful (Russ and Montgomery, 2002; Russ et al., 2003). Moreover, studies have shown that pipistrelle species and Leisler's Bat can congregate around urban street lighting feeding on the nocturnal winged-insects attracted to the lower impact lighting (Rydell et al., 1993, Blake et al., 1994; Stone et al., 2015; Spoelstra et al., 2015; 2017). Furthermore, recent studies have highlighted that the foraging frequency of pipistrelle species within a locality, that contains both street-lit and dark areas, is not influenced by the dimming of streetlights, regardless of the lights' output and capacity to attract prey items (Buddendorf et al. 2026). However, given that the long-term adverse impacts of higher streetlight luminance on affected invertebrate prey populations, all local bat species are ultimately negatively impacted by excessive / undimmed streetlight outputs.

Regarding the condition of habitats during the operation phase, the proposed development's surface water run-off from hardstanding areas will be managed by a series of SuDS features (mitigation-by-design elements), which include permeable paving; green roofs, grasscrete, swales; bioretention basins and pond, which will collectively provide surface water run-off attenuation, infiltration, and in-situ retention of sediments (and associated nutrients), metals, and hydrocarbons (Jurries, 2003; Anderson et al., 2016). The proposed SuDS will ensure that localised flooding during heavy rainfall events does not lead to the degradation of the operational habitats that will support the foraging and commuting resources for the local bat populations.

Given that bat species typically commute within / along dark areas / corridors (i.e. away from illuminated pedestrian and road infrastructure), bat species collision mortality risk is predicted to be negligible (not significant) during the operational phase of the development.

Therefore, in the absence of targeted bat mitigation during the operational phase, it is predicted that there will be an initial long-term adverse impact of moderate significance for bat species, as a

result of loss of potential roosting features; natural habitat reduction across the site; the addition of new bat-friendly habitats; lighting impacts, including the bottle-necking of dark corridors; and partial loss of other dark zones, negatively impacting foraging and commuting activities.

Breeding Birds [High Local]

Within the proposed development's landscape plans there is planting to extend the protected woodland to offset potential woodland loss; a larger section of new woodland is proposed than what will be removed. In time this will provide further refuge and nesting, foraging and commuting opportunities for breeding birds. An increased number of treelines throughout the new car park will also provide providing additional nesting and foraging opportunities for breeding birds. Improved meadows are proposed within the landscape plans which may increase the number of pollinators on site which will provide additional foraging opportunities for breeding birds on site.

In regard to conditions of habitats during the operation phase, the proposed development's surface water run-off from hardstanding areas will be managed by a series of SuDS features (mitigation-by-design elements), which include permeable paving; green roofs, grasscrete, swales; bioretention basins and pond, which will collectively provide surface water run-off attenuation, infiltration, and in-situ retention of sediments (and associated nutrients), metals, and hydrocarbons (Jurries, 2003; Anderson et al., 2016). The proposed SuDS will ensure that localised flooding during heavy rainfall events does not lead to the degradation of the operational habitats that will support the foraging and commuting resources for the resident and migrant breeding bird populations.

Therefore, in absence of mitigation, during the operational phase a long-term positive impact of moderate significance is anticipated for breeding birds.

Wintering Birds [High Local]

As part of the proposed development a new pond will be created on the eastern boundary of the site. This will provide foraging and refuge habitat for some of the wintering bird species that utilise the site, namely Mallard. However, the grassland area which is currently suitable for differing winter bird species will be lost to facilitate the installation of the new pond habitat. This grassland area currently provides potential foraging and refuge habitat for Snipe and Redwing, however this will be offset by the proposed improved meadows elsewhere within the site which will provide more comprehensive foraging and refuge habitat. Some species such as Black-headed Gull will lose foraging habitat but gain refuge habitat from the proposed pond creation as part of the proposed development.

The pond will also create new habitat for species that may not utilise the site currently but are recorded within the locale; these species may start to utilise it as refuge and foraging habitat. This will increase habitat availability for a variety of wintering birds which are birds of conservation concern such as Coot, Teal, Tufted Duck, and Wigeon.

The conditions of habitats, utilised by wintering birds, during the operation phase, will be managed by the proposed development's surface water run-off from hardstanding areas by a series of SuDS features (mitigation-by-design elements), which include permeable paving; green roofs, grasscrete, swales; bioretention basins and pond, which will collectively provide surface water run-off attenuation, infiltration, and in-situ retention of sediments (and associated nutrients), metals, and hydrocarbons (Jurries, 2003; Anderson et al., 2016). The proposed SuDS will ensure that localised flooding during heavy rainfall events does not lead to the degradation of the operational habitats that will support the foraging and commuting resources for the resident and migrant wintering bird species.

Therefore, in absence of mitigation, during the operational phase a long-term positive impact of slight significance is anticipated for wintering birds within the site for the proposed development.

Amphibians [High Local]

The creation of a new pond will provide a standing freshwater body with aquatic and semi-aquatic vegetation present. This will provide breeding habitat for both Common Frog and Smooth Newt, both species which are recorded in the locale. Furthermore, the relocation of the woodland will

ensure that woodland is nearby the new pond feature. This is ideal for Common Frog and Smooth Newt, which can migrate to this woodland area after maturing within the pond and pond edge habitat. The woodland will create foraging and refuge habitat within close proximity to the breeding habitat, ensuring these amphibian species are exposed to less risk whilst moving between these habitats. This will increase survivability of both species.

It may take time for the pond to attract amphibians, its presence will allow for future relocation or introduction efforts of these species to help establish a local population if required.

Of particular concern is the surface water run-off from hardstanding areas into the on-site terrestrial and aquatic habitats utilised by the local Common Frog and Smooth Newt populations. However, the proposed series of SuDS features (mitigation-by-design elements) installed permeable paving; green roofs, grasscrete, swales; bioretention basins and pond, which will collectively provide surface water run-off attenuation, infiltration, and in-situ retention of sediments (and associated nutrients), metals, and hydrocarbons (Jurries, 2003; Anderson et al., 2016). However, the swale, bioretention basins and pond frequented by amphibians, will come in contact with urban surface water run-off, resulting in minor periodic aquatic osmotic pollution exposure, which will have potential knock-on impacts for the amphibians, and their spawn, present within these habitats, as well as their prey items.

Collision mortality risk for Common Frog and Smooth Newt is predicted to increase during the operational stage of the development, given the increased vehicular presence and the bisecting and/or removal of existing wildlife commuting corridors.

Therefore, in the absence of mitigation, during the operational phase a long-term positive impact of moderate significance is anticipated for amphibian species within the site for the proposed developed.

Fish [County / High Local]

In respect to the local fish population within the River Liffey (including Atlantic Salmon, lamprey spp. and European Eel as well as course fish), the proposed development's main operational emission of concern is the surface water run-off from hardstanding areas within the proximity of the site's existing drainage ditch to the northeast. However, the site's surface water run-off from hardstanding areas will be managed by a series of SuDS features, that do not flow into the existing drainage ditch and will include permeable paving; green roofs, grasscrete, swales; bioretention basins and pond, which will collectively provide surface water run-off attenuation, infiltration, and in-situ retention of sediments (and associated nutrients), metals, and hydrocarbons (Jurries, 2003; Anderson et al., 2016), before it enters the local existing surface water infrastructure to the north-west and south-east of the site. The proposed SuDS will ensure that localised flooding during heavy rainfall events directs surface water flows away from the existing drainage ditch safeguarding the River Liffey fish population downstream.

Therefore, in the absence of mitigation during the operational phase of the development, the local fish population is anticipated to experience a long-term neutral impact, that is not significant.

Terrestrial Invertebrates [High Local]

As part of the proposed development foraging, refuge and breeding habitat will be created for terrestrial invertebrates. This includes the installation of green roofs, grassland management changes, hedgerow planting, woodland planting, and the installation of a pond with associated vegetation. This will increase the availability of a range of habitats that are suitable for a wider range of terrestrial invertebrates, this includes faunal groups such as damselflies, dragonflies, snails, beetles, and true flies.

With the introduction of the pond and enhancement of existing habitats, it is likely that the species diversity as well as the abundance of terrestrial invertebrates will increase. Some predation from other species may be expected if the site becomes suitable to Common Frog, and a variety of bird species, however; overall the improved suitability of the habitat on site will create an overall positive impact.

Therefore, in the absence of mitigation, during the operational phase a long-term positive impact of moderate significance is anticipated for terrestrial invertebrate species within the site for the proposed development.

4.5.4.5 Invasive Non-native Species

It is not anticipated that the operation of the proposed development will cause further spread of invasive non-native species. However, the proposed development does present the opportunity to remove these from selected areas, i.e., Cherry Laurel removal from the protected woodland.

4.5.5 Summary

The following potential significant impacts have been identified below, with the necessary mitigation discussed in the next chapter:

- Deconstruction and incorporation into new works of sections of stonewall and other stonework
- Permanent loss of mature woodland associated with a Proposed Natural Heritage Area.
- Disturbance of commuting and foraging habitat for terrestrial mammals, bat species, breeding and wintering birds, as well as potentially fatal entrapment for these faunal groups.
- Short-term loss of nesting site for local breeding birds.
- Permanent loss of potential roost sites for local bat species.
- Permanent loss of foraging ground for breeding birds and mammals.

The mitigation is based on that proposed in existing guidance documentations and where necessary additional mitigation is proposed to reduce the impacts identified above.

4.6 Mitigation Measures

The Construction Phase mitigation sections below will be divided into:

- Standard Best Practice Guidance (4.6.1);
- Pre-Enabling Phase (4.6.2);
- Construction Phase (4.6.3); and
- Operational Phase (4.6.4)

4.6.1 Standard Best Practice Guidance

The following guidance documents will be followed during the project's pre-enabling, construction, and operational phases. Specific mitigation measures designed based on this guidance, during the project's pre-enabling, construction, and operational phases are outlined in sub sections 4.6.2, 4.6.3, and 4.6.4 respectively.

4.6.1.1 Construction Environmental Management Plan (CEMP) Guidance

Prior to the commencement of any site works, a Construction and Environment Management Plan (CEMP) will be submitted to South Dublin County Council for agreement. This CEMP will incorporate the mitigation measures outlined in sub-sections 4.6.2 and 4.6.3, and will strictly adhere to best practice environmental guidance including but not limited to the following:

- CIRIA Guidance C532 Control of water pollution from construction sites. Guidance for consultants and contractors. (CIRIA, 2019 - www.ciria.org);
- CIRIA Guidance C741: *Environmental good practice on site guide* (Charles & Edwards, 2015; CIRIA, 2019 - www.ciria.org);
- CIRIA Guidance C750D: *Groundwater control: design and practice* (Preene *et al.*, 2016; CIRIA, 2019 - www.ciria.org);
- CIRIA (C512): Environmental Handbook for Building and Civil Engineering Projects (CIRIA, 2000);
- CIRIA (C697): The SUDS Manual (CIRIA, 2015);

4.6.1.2 Water Quality Guidance

Relevant legislation and best practice guidance that have been considered includes but not limited to the following:

- Water Framework Directive (2000/60/EC);

- European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (S.I. No. 272 of 2009);
- Local Government (Water Pollution) Acts 1977-1990;
- CIRIA C532 Control of water pollution from construction sites. Guidance for consultants and contractors. (www.ciria.org);
- CIRIA Guidance C750D: Groundwater control: design and practice (Preene et al., 2016) (www.ciria.org);
- CIRIA C515 Groundwater control – design and practice, 2nd ed. (CIRIA, 2021 - www.ciria.org)
- CIRIA Guidance C741: Environmental good practice on site guide (Charles & Edwards, 2015; CIRIA, 2020 - www.ciria.org)

4.6.1.3 Concrete Guidance

The contractor will be required to use experienced operators for the work; provide an appropriate level of continuous monitoring during any concrete pours by experienced management; and have method statements approved by the client prior to commencing works. Works will be carried out using recommendations from current guidance and relevant codes of practise as outlined in EA (2011) - *Managing concrete wash waters on construction sites: good practice and temporary discharges to ground or to surface waters*.

4.6.1.4 Noise and Vibration Guidance

With regard to construction activities, reference will be made to British Standard BS 5228-1, which offers detailed guidance on the control of noise from demolition and construction activities.

Additional guidance relevant to acceptable vibration and noise levels will be followed and is contained in the following documents:

- British Standard BS 7385: 1993: Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration.
- British Standard BS 5228-2: 2009: Code of Practice for Noise and Vibration Control on Construction and Open Sites: Vibration.
- NRA: 2014: Guidelines for the Treatment of Noise and Vibration in National Road Schemes.

4.6.1.5 Lighting Guidance

During the construction phase, an appointed Ecological Clerk of Works (ECoW) will be present when site lighting is initially set up in the works areas and will be responsible for monitoring lux levels to ensure they are not impacting dark corridors or foraging habitat for local crepuscular/nocturnal fauna. The following best practise guidance will be strictly followed by the ECoW:

- Bats and Artificial Lighting at Night – Guidance Note 08/23 (BCT, 2023);
- Bats & Lighting – Guidance Notes for Planners, Engineers, Architects and Developers (BCI, 2010); and
- The reduction of Obstructive Light – Guidance Note GN01/21 (ILP, 2021).

4.6.2 Pre-Enabling Phase

Due to the requirement of this proposed development to encroach on the pNHA woodland adjacent to the existing site, some mitigation measures will need to be implemented prior to the beginning of site clearance or construction. All these works will need to be constantly monitored by a suitably qualified ECoW.

The pre-construction works will need to be carried out in a specific order due to availability of space and sensitivity of the woodland habitat being relocated. The space to receive the relocated woodland will need to be prepared. This will ensure the woodland sods are in place as promptly as possible limiting any impact the relocation will have. Additionally, the lifting of the grassland sods from the meadow areas and the creation of a protected area for the seed bank/sods to be stored,

alongside the creation of the pond/wetland area will need to be commenced prior to the commencement of the construction phase.

The pre-enabling measures have been listed below in order, with the first step to complete a suite of pre-enabling work surveys, which will provide information that directly feeds into the CEMP, followed by the meadow seedbank relocation, pNHA woodland relocation, and pond creation.

4.6.2.1 Ecological Surveys

Due to the requirement of this proposed development to encroach on the pNHA woodland adjacent to the existing site, some mitigation measures will need to be implemented prior to the beginning of site clearance or construction. All these works will need to be constantly monitored by a suitably qualified ECoW.

The lifting of the grassland sods from the meadow areas and the creation of a protected area for the seed bank/sods to be stored, woodland relocation and planting then fencing off, pond creation, hoarding and fencing will all need to be implemented prior to the commencement of the construction phase. Prior to these steps, a number of pre-enabling phase ecological surveys of the most sensitive ecological receptors within and adjacent to the proposed site will be carried out. These include the following:

- Additional woodland survey of the proposed area of pNHA woodland to be relocated. This survey should follow the methodology outlined within the National Survey of Native Woodland 2003-2008 (Perrin et al., 2008a, Perrin et al., 2008b), which is summarised with relation to the proposed site below;
 - Woodland walkover survey to identify current species composition, dead wood abundance, invasive species presence, and internal features within the pNHA woodland within the site;
 - 5m by 5m relevé for each recorded vegetation community identified within the pNHA woodland during the updated walkover survey;
 - Cover in vertical projection for all vascular and bryophyte species will be recorded on the Domin scale;
 - Within each relevé, tree size, abundance and stem quality will be measured. The species and number of all stems with a diameter at breast height (dbh) <7 cm will be recorded in each relevé using five height classes – a simplified version of Raunkier's scheme including the following;
 - Differentiation will be made between stems which are basal shoots of mature trees and those which are not (free regeneration).
 - As the density of trees varies greatly between woodlands, the plot size for assessment of mature trees will be increased as required beyond the relevé to allow a statistically representative sample of c. 15 trees to be recorded. Mature trees are defined as trees that have a Diameter at Breast Height (dbh) ≥7 cm. Dbh is a standard measurement for the diameter of a tree's trunk diameter, typically taken at 1.3m (4.3 feet) above the ground (Lukaszkiwicz and Kosmala, 2008)).
 - Diameter at breast height can be calculated by measuring the circumference of a tree using a tape measure and dividing this by π (≈ 3.14).
 - Each mature stem will be given a tree number, with multiple stems from the same tree sharing the same tree number. This permitted account is to be made for typically multi-stemmed species, such as hazel, in subsequent density calculations. For each stem the following information will be recorded:
 - Species
 - Dbh
 - Crown position relative to other trees recorded in four classes: Dominant (trees emerging from the general canopy level) Co-dominant (trees forming the canopy) Intermediate (trees in the lower canopy receiving some direct light from above) and Suppressed (trees completely overtopped by the canopy)

- Height (to the nearest metre)
- For trees of with a dbh of greater than 40cm, the following additional data will be recorded:
 - The presence of the following stem defects: forks, heavy branches, stem galls/cankers, kinks/bends, damaged stem/bark, lean >10%, fluted/buttressed bole, excessive taper, shelf fungi or other stem disease, excessive ivy, epicormic shoots.
- For each relevé, altitude, slope, aspect, and 10 figure GPS must be taken
- Three soil samples should be taken for each relevé, (one from the centre and one from each quadrant) with an aluminium soil corer to a depth of 10 cm, and bulked;
- Soil samples should be sent for laboratory analysis to determine pH levels and phosphorus levels;
- Within the relevé, the stratification of the woodland will be sketched and photographed and the height and percentage cover for each stratum (canopy, sub-canopy and shrub layer) recorded.
- The results of this survey will be made available to NPWS, the FCC Biodiversity Officer, and the project ECoW.
- Updated Badger survey within the woodland habitat within the site, including the camera trapping of any existing active/inactive setts. These will ideally be conducted between October and March when vegetation cover will be a less significant obstacle to surveyors. The survey will be conducted no more than 10-12 months prior to the commencement of works;
- Updated potential bat roost assessment, with a particular focus on trees due to be felled/damaged during the construction phase, as well as within the existing structures on site including the historic walls due for demolition/refurbishment;
- Updated bat activity and static surveys to determine current activity levels and bat species assemblages within the site and improve on existing sub-optimal bat data, for later comparison with surveys post construction;
- Breeding bird nest check, with a particular focus on any location where trees are being relocated, felled or trimmed back. Additionally, the breeding nest checks will also include the checks for nesting birds within the existing buildings and stonewall structures on site;
- An updated invasive species survey to track the potential spread of invasive flora present on-site, with a particular focus on the current distribution of invasive species within the pNHA woodland habitat.

In the event that these surveys indicate any significant changes in the baseline ecology, such as an inactive Badger sett becoming active, an identified new sett, or the presence of any new potential roosting features, the project's construction environmental management plan (CEMP) will have to be updated by the ECoW.

4.6.2.2 pNHA Woodland Relocation

Woodland Donor Site Preparation and Meadow Seed Bank Storage

The proposed area of the relocated woodland includes a section of the meadow habitat to the northeast of the site, which will need to be cleared to facilitate this. However, the existing seed bank will be harvested and temporarily stored for later use within the green roofs of the proposed southern hospital building. This will require the harvesting of the seed bank and the creation of a protected area for the seed bank to be stored whilst the construction of the buildings is undertaken.

The following methodology is proposed for the preparation of the donor site and temporary storage of the meadow seed bank:

- The top 30cm of soil from the meadow habitat within the donor site for the relocated woodland will be excavated. This will allow the turves cut from the woodland habitat to be graded into this area without changing the local topography.
- The excavated soil will be temporarily stored for later use on the green rooves. This material will be stored with the lawn area to the east of the existing northern hospital

building. This area is of low ecological value in the context of the wider site area. For the excavated material, the following measures will be strictly adhered to:

- Prior to the storage of the excavated material, an area of the lawn will be covered with terram to preventing the re-rooting of the excavated material into the underlying lawn, allowing for easier relocation later.
- The edges of the stored soil will be protected from wind using hessian which will be rolled and pinned to the exposed edges.

The methodology for the relocation and management of the excavated material onto the green roofs is described in detail within the operational phase mitigations, in sub-section 4.6.4.

Woodland Relocation Rationale

Once the existing meadow area is cleared and prepared to receive the woodland sections to be relocated, extraction of the existing woodland sections will commence. The relocation of the woodland soil layer must take place outside the breeding bird season (1st March – 31st August), during which time vegetation is largely dormant and as such removal/relocation is less stressful.

To achieve this in the most efficient manner, it is recommended that the section of the existing wall that is to be demolished to facilitate the proposed development is demolished to allow for the woodland to be accessed directly. This will allow for more manoeuvrability of the machinery that will be required to carry out the necessary works for the relocation.

Prior to any invasive and abstractive works within the woodland, the exact area of woodland to be relocated, which includes the area of the proposed hospital building that will extend into this habitat, the additional 5m buffer around this building that includes the utility channel, will be demarcated. This immediate area will then be hoarded off using 2.4m high hoarding to protect the surrounding woodland and local fauna during the relocation works.

The hoarding will extend either side of this area up to the retained historical walls along the northern boundary of the proposed southern hospital site. The hoarding will ensure that the retained sections of the woodland are not encroached on by vehicles or workers, as the mycelium network and soil biota will be more vulnerable to further stresses after the relocation. This will also prevent any fauna from entering the site during the relocation of the proposed woodland and subsequent construction works. This will be in place for the duration of the construction phase.

For the relocation of the woodland, the aim is to retain as much of the mycelium network and woodland flora as intact as possible. Mycelium networks create symbiotic relationships with a variety of flora, especially with woody plants such as trees and shrubs. Relocating intact sections of woodland will allow for these relationships to be maintained. The retention of mycelium networks will allow the relocated woodland sections to recover faster and establish more effectively in the new location.

This will be achieved by utilising specialised machinery and following a soil translocation methodology that will limit vertical soil mixing. It is imperative that soil mixing be avoided as much as possible to avoid disruption to the mycelium network. Mixing of the soil will change the depth and environment of seeds within the translocated soil, this will impact the woodland specialist seeds as they require more specific conditions for germination, whereas ruderal species are adapted to disturbed soil. The seeds within the seed bank tend to be dominated by more persistent ruderal species that are waiting for disturbance (such as vertical soil mixing resulting from digging) to provide ideal conditions for them to germinate (Woodland Trust, 2017). Once these species establish, it becomes harder for the typical plants/trees to establish.

However, due to the differences in the habitats there will need to be considerations made for the larger and tougher root systems that will be present within the woodland sections. Additionally, where possible, young trees and sapling will be saved for relocation. These trees will need to have a shallow enough root systems to be extracted within the woodland turves which will have a depth of 30cm. Incorporating existing viable trees with the existing soil will preserve the mycelium relationships as much as feasibly possible during a translocation. It will also ensure the continuation of the local trees and shrub species which will become the dominant canopy and shrub layer for the donor site. This will be determined by an arborist and ecologist prior to extraction.

Woodland Relocation Methodology

Considering these factors, the following methodology for the translocation of the woodland will be strictly followed under the supervision of a suitably qualified ECoW and outside the breeding bird season (March 1st - August 31st inclusive):

- Step 1: Stonewall demolishment
 - The existing section of the stonewall to be demolished to facilitate the proposed development will be demolished.
- Step 2: Hoarding
 - Demarcation of exact area of woodland that will be cleared. This area will then be separated from the retained woodland sections with 2.4m high hoarding.
- Step 3: Tree assessment and clearance
 - An arborist and ecologist will assess the trees within the hoarded woodland area and determine young trees suitable for relocation. These trees will need to have a shallow enough root systems to be extracted within the woodland turves which will have a depth of 30cm. These will then be marked out and will not be cleared.
 - All other trees will subsequently be felled, while their underlying root systems will be retained and will not be excavated to preserve the structure of the underlying soil.
- Step 4: Turf relocation
 - Woodland turves will be lifted using a grid pattern and transported directly to the donor site to the north on the same day to avoid the habitat fragmentation. Turves will have dimensions of 2m x 1m, with a depth of 30cm. Turves of less than 150mm deep will not be translocated.
 - Saplings to be retained will be transported within these turves, alongside the base and part of the underlying root systems of the trees that were felled in step 3.
 - Excavators with modified turf cutters with grass lifting buckets will be used to take grassland and topsoil (Figure 4-20).
 - The turves will be placed within the receptor site with a spacing of no more than 50mm between each turf. Handling will be kept to a minimum to prevent materials from separating and maintaining pre-existing moisture levels. Soil from broken turves will be utilised to fill up gaps between the turves. This soil will contain both plants with their roots and see banks from the receptor site and will also protect the turf root systems from heavy rainfall or frost.
 - Any large cracks opening in the turves will be filled by hand using loose soil from the original site.
 - To limit the extent of trampling of turves, operatives will use a single access route.
 - This phase will only be conducted between October to February inclusive, although the autumn period is considered optimal as soils are usually warmer and this avoids wetter winter conditions.
 - Soil moisture levels will be continuously checked and compared with pre-translocation levels. Should moisture levels fall significantly after moving and if no rain is forecast for a period of five consecutive days a soil specialist will be consulted to inspect the ground conditions and will advise if the works can proceed in accordance with the objective of protecting the condition of the turves.
 - To water the turves in the event of a dry period and / or hot weather, high-powered, low-pressure sprinklers will be utilised to keep the soil layer sufficiently moist.



Figure 4-20: Example of modified turf excavator bucket for moving turves from trailer and placing them within temporary storage area/main receptor site (LEE, 2025)

- Step 5: Additional hoarding
 - Once the woodland turves have been relocated, hoarding will then be erected along the relocated woodland area to prevent further disturbance during the construction phase.
 - Access to the woodland donor site area will only be provided for the on-site ECOW and subsequent ecologists responsible for the woodland monitoring
- Step 6: Monitoring
 - During the construction phase and subsequent operational phase, a long-term monitoring plan will be in place to assess the success of the proposed woodland relocation mitigation, as well as continually manage ruderal and invasive species. The following steps will be followed to ensure robust monitoring of the translocated woodland. These will be conducted by a suitably qualified ecologist with expertise in woodland habitats:
 - Following the relocation of the turves, the translocated soils will be watered on placement at the receptor site under guidance from a suitably qualified ecologist to aid establishment and reduce transplanting shock on coppice stools, saplings and standards. The frequency of watering and checks on the translocated soil and saplings will be determined dynamically by the ecologist during the immediate period after translocation.
 - For the duration of the construction phase, monitoring of the woodland will be conducted twice a year (Worrell et al., 2021). All invasive species will be removed as they are identified. Ruderal species such as bramble will be appropriately managed to prevent these species from becoming dominant. This will be determined and undertaken dynamically by the ecologist. Additionally, the health of the translocated saplings will be assessed, and what woodland plant/tree species, if any, have started to establish. A determination will also be made if additional planting of native tree species will need to be undertaken within this area.
 - Monitoring during the operational phase can be conducted at longer intervals (annually if appropriate) and will continue to ensure invasive species do not establish and ruderal species do not dominate. The ecologist monitoring the translocated woodland will also continue to map dynamic assessments of potential additional measures to be implemented to improve the health of the translocated woodland, such as the planting of

local and native saplings. Ideally operational monitoring will be conducted annually for a period of at least 20 years given the complexity of woodland habitats and the time taken for these habitats to develop (Woodland Trust, 2017).

- With regard to Sycamore, which is considered a Medium Risk invasive species in Ireland and is now widespread across Ireland, there are mixed views on the species, with some viewing it as an aggressive coloniser and a threat to native biodiversity, and by others as a contributor to high levels of biodiversity (Stroh et al., 2023). However, the negative impact is likely only readily observable when the right conditions allow for this species to dominate. Provided that the canopy cover of the other native tree species is maintained within the new woodland area, Sycamore should not dominate. This is due to Sycamore requiring high light values and will typically only succeed in gaps in the woodland. However, under the precautionary principle, any Sycamore seedlings or saplings identified within the translocated woodland area will be controlled by hand pulling, following their identification by the ECoW and under their subsequent supervision.
- All the findings of the monitoring surveys will be recorded, and more detailed information on ecological change should be obtained using permanent plots and fixed points photography. This information will be shared with NPWS and the DCC Biodiversity Officer. Additionally, any planting/other enhancement measures will be agreed to with NPWS and the DCC Biodiversity Officer prior to their implementation.

The outlined methodology aims to limit vertical soil mixing as much as possible and retain the structure of the topsoil layer during translocation. However, outcomes of woodland translocation are mixed, and the above approach must be assessed throughout dynamically, with alternative measures discussed when needed (HS2, 2020).

Additional Woodland Clearance

There will be additional small encroachments into the woodland to the east of the proposed facilities building and service yard waste compound, and to the north of the existing St Edmundsbury Hospital building, to make way for a proposed ESB Substation. Once access has been established to these areas, including the clearance of any adjacent stonewalls, the exact area to be cleared will be demarcated.

This immediate area will then be hoarded off using 2.4m high hoarding to protect the surrounding woodland and local fauna during clearance works. The hoarding will ensure that the retained sections of the woodland are not encroached on by vehicles or workers, as the mycelium network and soil biota will be more vulnerable to further stresses after the relocation. This will also prevent any fauna from entering the site during the relocation of the proposed woodland and subsequent construction works. This will be in place for the duration of the construction phase.

Once the hoarding has been established, these areas can be cleared for construction. These steps will only be undertaken under the supervision of the onsite ECoW.

4.6.2.3 Pond/Wetland Creation

As part of the landscape plans for the proposed development a new pond/wetland will be created on the eastern boundary of the site, this will involve the partial clearance of an area of meadow to the immediate east of the translocated woodland doner site. As described above, the woodland relocation will take place prior to the creation of the pond, and hoarding will be placed along the woodland doner site's eastern border. This will prevent disturbance during the construction phase, as well as during the creation of the proposed pond area and surface water drainage infrastructure.

The proposed surface water drainage network will flow into the pond to the north. An emergency high level outflow will be connected to the south of the proposed pond and will connect with additional surface water infrastructure under the road to the east. These proposed connections will have be established during the pre-enabling phase, prior to the commencement of the construction phase, and prior to later modifications to the design of the pond.

As the proposed pond/wetland area will be SuDS feature and has been incorporated into the design of the operational surface water management plan, it will be designed in accordance with the CIRIA SuDS manual 2016 (CIRIA, 2016). Additional considerations will be made for enhancing the biodiversity as detailed within the Irish Pond Manual (The National Trust of Ireland, 2024). While the most biodiverse ponds are typically created using a two or multistage design process, this will not be suitable in this case as the pond will immediately be filled due to its connection with the proposed surface water drainage layout. However, monitoring of the pond during the construction phase, following its excavation, will allow ongoing assessment of its ecological condition and allow for additional enhancement measures to be considered which do not compromise its primary role as a SuDS feature. Additionally, planting around the edge of the pond/wetland area will allow the faster stabilisation of the habitat edges and create habitat for local fauna.

Considering these factors, the following methodology, following the CIRIA SuDS Manual 2016, for the creation of the pond will be strictly followed under the supervision of a suitably qualified ECoW;

- Step 1 - Planning
 - The shape of the proposed pond will be determined, avoiding digging a very deep pond with uniform sides (Farming for Nature, 2024) and to allow easy access for maintenance purposes.
 - Calculate the quantity of spoil to be removed and identify suitable tipping location(s). Spoil will not be dumped within sensitive ecological indicator, such as any woodland habitat, or within the River Liffey floodplain.
 - The topsoil layer will be stored in the lawn area to the east of the northern hospital building alongside the excavated material taken from the woodland donor site. This material will later be used to form the green roofs on the southern building.
 - Determine depth of excavations - the pond will have a minimum depth of 300mm as specified in the SuDS specifications within the storm water drainage layout. The depth of excavations will exceed this depth to allow for emergency overflow.
- Step 2 - Excavation
 - For the excavation of the pond, light machinery will be used to minimise soil compaction of the area surrounding the pond. This will allow the colonising or planted flora in the area around the pond to establish itself quickly and spread effectively.
 - Excavations will ensure the banks of the pond/wetland area are graded in accordance with the CIRIA SuDS Manual to allow safe access to the water for future maintenance.
 - It is important to keep the transport system working efficiently as the speed of the job will normally be determined by the rate of spoil removal, not by the rate of digging. More than one dump truck will be used if required.
 - Spoil will be transferred directly from the excavator to a dumper or trailer to avoid double-handling (double handling is dumping the spoil on the ground before picking it up again to put it in a truck for disposal).
 - Monitoring of ground conditions will be continuous during the works. This is to ensure that dust generation is suppressed during drier periods of weather to minimise the spread of dust into the new woodland section. Mist sprayers will be used to minimise the spread of the dust that the works will generate and will be placed around the proposed excavation area.
 - The proposed surface water infrastructure will be established during this step, with the proposed northern inflow and southern outflow excavated and installed prior to the pond being filled.
- Step 3 - Planting, Hoarding, and Monitoring
 - Following the excavation of the pond and installation of the adjacent surface water infrastructure, planting will be conducted within the pond/wetland area edges using native species that will retain pollution and nutrients. Species that will be planted under supervision of the on-site ECoW include:
 - Common Reed *Phragmites australis*
 - Yellow Iris *Iris pseudacorus*

- Bulrush *Typha latifolia*
 - The position of planting will be determined at the detailed design stage, as well as any additional planting within the permanently wetted area of the pond.
 - The pond/wetland area will then be blocked off using 2.4m hoarding to prevent additional disturbance during the construction phase. Any access to this area will be for monitoring and maintenance purposes.
 - Monitoring of pond water levels will then be undertaken monthly for an initial observation year. Any wildlife using the pond will also be recorded. This will be undertaken by the ECoW.
- Step 4 - Additional Design Changes
 - Following an observation year, the ECoW will determine if any design changes to the pond are required, as well as if any shaping of the margins and shallows of the pond is suitable. These steps will only be undertaken under strict observation by the ECoW and will be in accordance with guidance within the CIRIA SuDS manual.
 - Any design changes will be done by hand or using a light excavator or hand tools which can work back from the pond edge (taking the water along too) shaping delicate undulations rapidly.
- Step 5 - Long-term Monitoring and Plant Management (2-5 years post excavation)
 - During the initial 2-5 years after excavation when the vegetation sward height is still establishing, plant management will be undertaken within the pond under the guidance of the on-site ECoW.
 - Any dominant plant species will be thinned or removed to promote floral diversity within the pond.
 - The pond will be monitored for invasive species, which will be removed immediately if identified.
 - Use of the pond by wildlife will be recorded.
 - Any additional invasive measures or potential further planting will only be considered/carried out following approval from the on-site ECoW.

4.6.2.4 Additional Site Hoarding

Following the completion of the woodland translocation and the creation of the pond, additional hoarding will be erected around the entirety of the woodland area along the boundary of the proposed adolescent unit, including the lawn area to the east, and along the northern boundary of the existing St Edmundsbury House and proposed ESB Station. The placement of the hoarding will also include the root protection zones of neighbouring trees. This will ensure that the retained sections of the woodland are not encroached on by vehicles or workers. This will also prevent any fauna from entering the site during the relocation of the proposed woodland and subsequent construction works. This will be in place for the duration of the construction phase.

4.6.3 Construction Phase Mitigation

The activities of the project for the construction phase shall remain within the boundary of the proposed site. Within this area, the mitigation measures outlined below shall be implemented.

4.6.3.1 Construction Environmental Management Plan (CEMP)

As described in sub-section 4.6.1, a CEMP, incorporating all pre-enabling and construction phase mitigations described in sub-sections 4.6.2 and 4.6.3, will be submitted to South Dublin County Council for agreement prior to site works commencing. These measures will also be incorporated into the site-specific CEMP that will be designed by the designated contractor.

4.6.3.2 Site Compound

- The works compound will be sited within the lawn area to the east of the proposed adolescent building. This is over 50m away from the River Liffey riparian zone and has ease of access from the road to the north. An area to the south of the site compound will be cordoned off and will temporarily store material excavated from the woodland donor site, which will later be used to create green roofs on the southern hospital building. This

will lead to a temporary loss of amenity grassland habitat. However, given its low ecological value and floral diversity, as well as the anticipated increase in disturbance during the construction phase, this will not have significant impacts for local floral and faunal species.

- Only plant and materials necessary for the construction of the works will be permitted to be stored at the compound location.
- Site establishment by the Contractor will include the following:
 - Site facilities (e.g., toilets);
 - Secure compound for the storage of all on-site machinery and materials;
 - Temporary car parking facilities;
 - Temporary fencing;
- Site Security to restrict unauthorized entry;
- Bunded storage of fuels and refuelling area. All tank and drum storage areas on the site will, as a minimum, be bunded 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 substances which could be stored within the bunded area.
- Spill kits will be stored in the site compound with easy access for delivery to site in the case of an emergency. Spill kits must include suitable spill control materials to deal with the type of spillage that may occur and where it may occur. Typical contents of an on-site spill kit will include the following as a minimum:
 - Absorbent granules;
 - Absorbent mats/cushions;
 - Absorbent booms;
 - Track-mats, geotextile material and drain covers
- All used spill materials e.g., Absorbent pads will be placed in a separate container which will be located in the Contractors compound to store absorbents used to contain spillages of hazardous materials. The container will be clearly labelled, and the contents of the container will be disposed of by a licenced waste contractor at a licenced site.
- All used spill materials will be placed separate container which will be located in the Contractors compound to store absorbents used to contain spillages of hazardous materials. The container will be clearly labelled, and the contents of the container will be disposed of by a licenced waste contractor at a licenced site. Records will be maintained of material taken off site for disposal.
- A maintenance programme for the bunded areas will be managed by the site environmental manager. The removal of rainwater from the bunded areas will be their responsibility. Records will be maintained of materials taken off site for disposal.
- The site environmental manager will be responsible for maintaining all training records.
- Potentially contaminated run off from plant and machinery maintenance areas will be managed within the site compound surface water collection system.
- Wherever reasonably practical, refuelling of vehicles will be carried out off site at designated refuelling areas to reduce risk of accidental hydrocarbon pollution events. These areas will be rendered impervious and will be constructed to ensure no discharges will cause pollution to surface or ground waters.

4.6.3.3 Water Quality

Relevant legislation and best practice guidance that have been considered includes but not limited

- To prevent watercourse pollution:
- Adoption of a surface water plan including appropriate barrier controls to prevent any polluted surface water from the site reaching the adjacent habitats of high local ecological value.
- Minimise area of exposed ground by maintaining existing vegetation in vicinity of site compound.

- Fail-safe site drainage and bunding through drip trays on plant and machinery will be provided to prevent discharge of chemical spillage from the sites to surface water.

4.6.3.4 Dust Generation Management

The contractor is required to implement the following measures in relation to air quality and climate during construction:

- The coordination, implementation and ongoing monitoring of dust produced by site activities. The key aspects of controlling dust are listed below:
 - The development of a documented system for managing site practices with regard to dust control;
 - Spraying of exposed earthwork activities and site haul roads during dry weather;
 - Provision of wheel wash at exit points, which will be located away from the canal;
 - Covering of stockpiles, which will be routinely inspected by the ECoW, EnvCoW and Site Environment Manager (SEM);
 - Control of vehicle speeds, speed restrictions and vehicle access; and
 - Sweeping of hard surfaced roads.
- Erection of a 2.4m high hoarding will be provided around work areas where allowable to minimise the dispersion of dust from working areas;
- Stockpiles will be located as far away as possible from sensitive ecological receptors and covered/dampened during dry weather;
- Generators will be located as far away as practicable from sensitive ecological receptors;
- To prevent the harmful emissions from vehicle exhausts, on-site and delivery vehicles will be prevented from leaving engines idling, even over short periods.
- Where Asbestos Contaminated Material (ACM) is uncovered on site during construction, the ACM will be double-bagged and removed from site by a competent contractor and disposed of in accordance with the relevant procedures and legislation.
- At all times, the measures used to control dust will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

To minimise effects to the climate through harmful emissions, the following controls shall be put in place:

- On-site and delivery vehicles will be prevented from leaving engines idling, even over short periods.
- Material wastage due to poor timing or over ordering on site will be minimised to reduce the embodied carbon footprint of the site.
- The travel distance required to complete the delivery of material and supplies shall be taken into account during procurement and minimised where possible. An outline of the specific travel and transport accommodations for this scheme are outlined in Chapter 9.

4.6.3.5 Concrete Management Procedures

The following measures will be implemented to prevent liquid concrete / cement-based dust entering the adjacent habitats of ecological value.

- Concrete delivery, concrete pours and related construction methodologies will be part of the procedure agreed with the contractor to mitigate any possibility of spillage or contamination of the local environment. Particular attention will be paid during the pouring process in order to avoid leakages or spills of concrete.
- Washout of concrete plant will occur off site at a designated impermeable area with waste control facilities.
- Raw, uncured or waste concrete will be stored appropriately prior to disposal by licenced contractor.
- The contractor's construction methodology will require the use of precast elements where practical; the use of secondary protection shuttering for concrete pours; all pours to be

carried out in dry weather conditions; and that all trucks be cleaned prior to leaving respective depots.

- As outlined in sub-section 4.6.1, the contractor will be required to use experienced operators for the work; provide an appropriate level of continuous monitoring during any concrete pours by experienced management; and have method statements approved by the client prior to commencing works. Works will be carried out using recommendations from current guidance and relevant codes of practise as outlined in **EA (2011) - Managing concrete wash waters on construction sites: good practice and temporary discharges to ground or to surface waters**.

4.6.3.6 Pollution Control and Spill Prevention

Spill kits containing absorbent pads, granules and booms will be stored in the site compound with easy access for delivery to site in the case of an emergency. A minimum stock of spill kits will be maintained at all times and site foremen's vehicles will carry large spill kits at all times. Absorbent material will be used with pumps and generators at all times and used material disposed of in accordance with the Waste Management Plan. All used spill materials e.g., Absorbent pads will be placed in a bunded container in the contractor's compound. The material will be disposed of by a licenced waste contractor at a licenced facility. Records will be maintained by the environmental site manager.

- Regular inspections and maintenance of plant and machinery checking for leaks, damage or vandalism will be made on all plant and equipment.
- In the event of a spill the Contractor will ensure that the following procedure are in place:
- Emergency response awareness training for all Project personnel on-site works.
- Appropriate and sufficient spill control materials will be installed at strategic locations within the site. Spills kits for immediate use will be kept in the cab of mobile equipment.
- All potentially polluting substances such as oils and chemicals used during construction will be stored in containers clearly labelled and stored with suitable precautionary measures such as bunding within the site compound.
- The site compound fuel storage areas and cleaning areas will be rendered impervious and will be constructed to ensure no discharges will cause pollution to surface or ground waters.
- Designated locations for refuelling are within Site Compound.
- Potentially contaminated run off from plant and machinery maintenance areas will be managed within the site compound surface water collection system.
- Damaged or leaking containers will be removed from use and replaced immediately.

4.6.3.7 Drainage Ditch Management

During the construction phase, in order to protect the drainage ditch and subsequent downstream aquatic habitats within the River Liffey, heras fencing will be erected at the start of the construction phase along the northern road immediately adjacent to the ditch. Additionally, a surface water dam will be installed at the ditches most southernly point within the site boundary, in proximity to the northern road (Figure 4-21). The dam will be constructed using silt screens staked the ground and underlain with fine gravel. This dam will act as a filter to surface water pollutants and excess sediment run-off during the construction phase. The dam will be checked daily by the onsite ECoW for slicks.

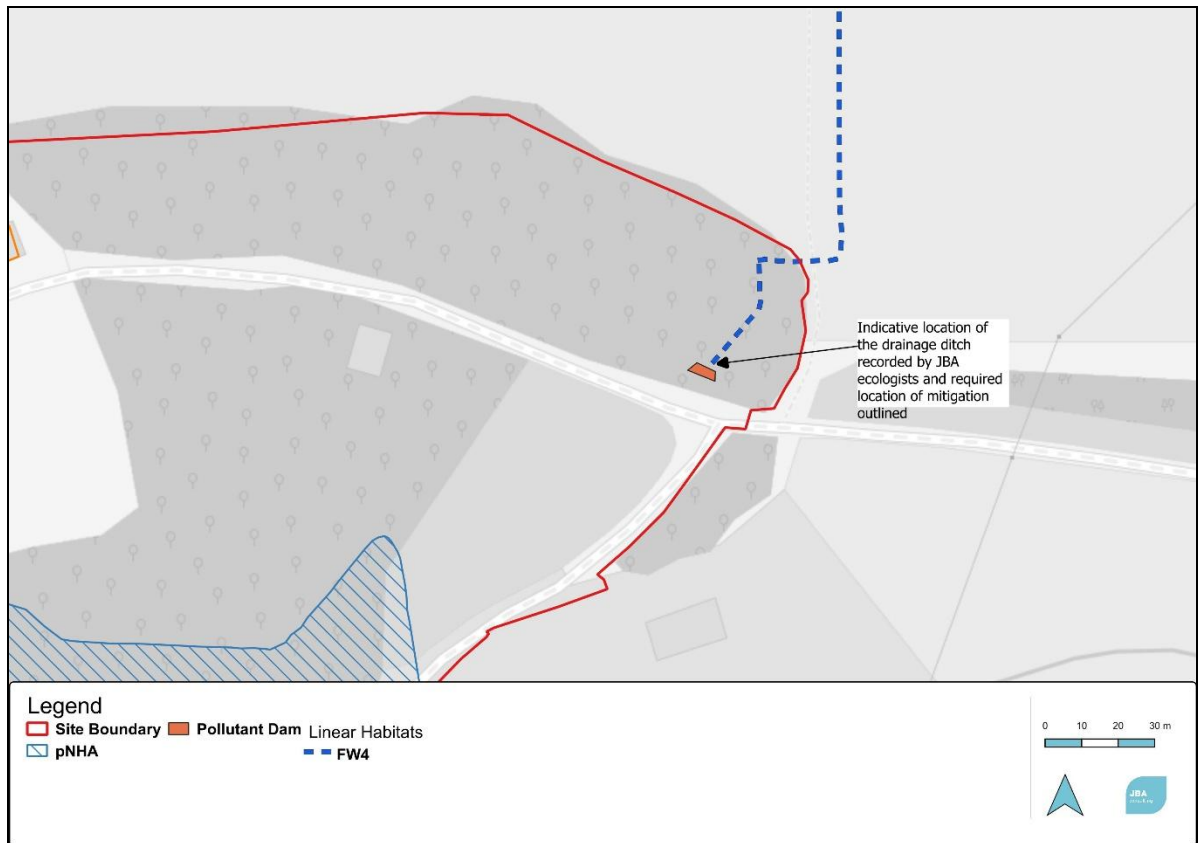


Figure 4-21: Location of proposed pollutant dam (OSM, 2026)

4.6.3.8 Noise and Vibration

The construction of the development will largely be limited to daylight hours where possible, ensuring minimum disturbance to commuting and foraging activities of local wildlife. The works will also be temporary. With regard to construction activities, the following measures will be employed:

- Erection of barriers at construction works boundary as necessary and around items such as generators or high duty compressors.
- Limiting the hours during which site activities likely to create high levels of noise are permitted. Construction activities will take place Monday to Friday, between 07:00 and 18:00, and on Saturdays, between 08:00 and 13:00.
- A site representative responsible for matters relating to noise will be appointed to liaise with South Dublin County Council.

4.6.3.9 General Avoidance Measures

Although it has been identified that there will be no permanent impact through disturbance to wildlife during the work, it is advised that general avoidance measures be undertaken to protect wildlife while the works are being carried out.

General avoidance measures that should be incorporated by the contractors working on site include:

- Limit the hours of working to daylight hours, to limit disturbance to nocturnal and crepuscular animals;
- Due to the potential presence of Otter; Badger; Irish Hare; Common Frog; and bat species, the use of lighting at night should be avoided. If the use of lighting is essential, then a directional cowl should be fitted to all lights to prevent light spill and to be directed away from all treelines / wooded areas.
- Contractors must ensure that no harm comes to wildlife by maintaining the site efficiently and clearing away materials which are not in use, such as wire or bags in which animals can become entangled; and

- Any pipes should be capped when not in use (especially at night) to prevent local fauna becoming trapped. Any excavations should be covered overnight to prevent animals from falling and getting trapped. If that is not possible, a strategically placed plank should be placed to allow animals to escape.

4.6.3.10 Construction-based Lighting

During the construction phase, all construction-based lighting will follow the measures outlined below, under the supervision of the appointed ECoW, to minimise disturbance to the surrounding environment:

- Site lighting required during construction phase will be installed in a manner that it is positioned, directed and cowed away from any dark corridors (e.g. pNHA woodland), therefore avoiding any unnecessary light spill and disturbance to bat activities.
- The intensity of lighting will be kept to the minimum level required for safety and security.
- Low-UV LEDs or low / high pressure sodium lamps will be the preferred bulb type, as they have least adverse effect on bats. Mercury, metal halide or high-UV LED bulbs will not be used.
- The site lux levels at suitable foraging and commuting habitats for local bat species will not be increased above 1lux in important dark corridors as a result of construction activities within the proposed development's work area.
- Wherever reasonably possible, works will be carried out in daylight hours in order to reduce the need for lighting on site (outside of compound areas). No lighting will be in operation outside of working times.
- The appointed ECoW will be present when site lighting is initially set up in a works area and will regularly monitor the lux levels to ensure that they are not impacting dark corridors or secondary foraging locations.

4.6.3.11 Tree root compaction and limb damage avoidance

In order to avoid the damage and compaction of roots and vegetation, storage and movement of machinery should be avoided in rooting zones adjacent to the trees, and fences should be in place in the areas of the of trees and hedges that are not scheduled for excavation and construction works.

4.6.3.12 Biosecurity

The following best practice measures will be implemented on site to prevent the introduction or further spread of invasive species:

- Any invasive species identified on site to be fenced off, clearly marked and avoided before commencement of works, which will be monitored by the ECoW prior to any works.
- If not possible to avoid infested areas, invasive species are to be dealt with in accordance with NRA guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (Rev 1, 2010).
- Good construction site hygiene to be employed in all works areas. All personal and visitors to disinfect boots before entering or leaving site. Vehicles entering or leaving site to be thoroughly washed in appropriately spaced wash areas. Run-off from vehicle wheel wash areas to be appropriately managed without discharge to adjacent watercourses.
- Any imported material to be formally documented as invasive free and confirmed by ECoW before acceptance on site.
- Any potentially contaminated material arising from site must either be treated on site or re-used within the site boundaries to mitigate the risk of spread.
- Following completion of works, a monitoring program will be established to ensure no additional spread of invasive species has occurred and that ongoing treatment of invasive species has been effective.

All operatives to be briefed in the procedures for handling the invasive species that have been identified on site after commencement of construction works. Biosecurity awareness training will be conducted on site as a toolbox talk for any staff working on site and if any INNS is uncovered during the construction, works are to cease in the vicinity and the presence will be reported to the Environmental Manager who will consult with an appropriately qualified ecologist for guidance on its management/removal.

4.6.3.13 Construction Phase Ecological Monitoring

For the duration of the construction phase, to assess the efficacy of the outlined mitigation and management measures, monitoring plans will be followed for the most sensitive ecological receptors within the vicinity of the site. These are outlined below.

(Mixed) broadleaved woodland

These surveys will assess the condition of the retained woodland area within a 250m buffer of the proposed works, to account for potential dust pollution. These surveys will assess the health of the woodland and monitor the spread of any invasive species, as well as inspect site hoarding. The CEMP will be updated with the results of these surveys, and any significant changes to the condition of the woodland compared to the baseline conditions established pre-construction will be communicated to the on-site ECoW and the SDCC Biodiversity Officer. Woodland surveys will be conducted annually for the duration of the construction phase and will be conducted in addition to the presence of an on-site ECoW and the monitoring of the translocated woodland.

Hairy St John's-wort

Surveys will be conducted annually to assess the health of the existing Hairy St John's-wort population within the woodland area, as well as assess the potential spread of this species. The CEMP will be updated with the results of these surveys, and any significant changes to the population of this species compared to the baseline population established pre-construction will be communicated to the on-site ECoW and the SDCC Biodiversity Officer.

Badger

Surveys will be conducted annually for the duration of the construction phase to assess the health of the local Badger population. The CEMP will be updated with the results of these surveys, and any significant changes to the population of this species compared to the baseline population established pre-construction will be communicated to the on-site ECoW and the SDCC Biodiversity Officer.

Bats

Monitoring of bats will be conducted yearly for the duration of the construction phase with measurements of light levels on site taken. This will be completed during the summer seasons as per best practice (Marnell et al 2022 & Reason, P.F. and Wray, S. (2025)). The features to monitor include ensuring commuting routes are still being used, specified lighting levels are followed, that the increased level of human activity adjacent to the woodland is not displacing bats.

Birds

Monitoring of birds will be conducted yearly for the duration of the construction phase taking place during the bird nesting period (March to August inclusive) as per best practise guidance. Monitoring will identify any new nests within the proposed site, as well as activity levels within previously identified nests. Monitoring surveys will also include the inspection of trees that will be removed/are damaged during the construction phase to ensure no new nests have been created there.

Invasive Non-native Species

Invasive non-native species will be surveyed yearly for the duration of the construction phase within and around the site. The CEMP must be updated with the results of these surveys and any invasive species identified removed under supervision of the on-site ECoW following species specific best practise guidelines.

All construction monitoring will be devised and conducted by a suitably qualified ecologist, with all woodland monitoring being undertaken by an ecologist with specialist knowledge of woodland

habitats. The results of these surveys will be recorded and made available to the ECoW, NPWS, and the DCC Biodiversity Officer.

4.6.4 Operational Phase

4.6.4.1 Additional Woodland Planting

During the site's operation, no planting will be undertaken within the woodland habitat, either within or adjacent to the pNHA boundary.

The proposed development's landscape master plan includes area of woodland being translocated to expand the current protected woodland to the east of its current extent. Translocating saplings found on site and use of seeds collected from the woodland will ensure the seed source and newly planted trees are of local provenance. However, this new woodland patch will be juvenile and will take time to replace the ecological services provided by the woodland section that is to be removed.

Any potential planting measures considered for the translocated woodland area will be determined by the ecologist responsible for monitoring this area and will only be carried out with approval from NPWS and the DCC Biodiversity Officer. Any trees planted within the site will require additional checks to avoid the introduction of diseases to the area - in particular, in the event any Oak species are planted on site, they will be additionally checked for the non-native Oak Processionary Moth *Thaumetopoea processionea*. The caterpillars of this species feed on the leaves of oak trees, causing severe defoliation leaving trees weakened and open to secondary infections. Additionally, they have been observed feeding on other native tree species, including Birch, Hornbeam, Hawthorn, Hazel, and Beach. This species also poses a potential risk to human and animal health, as these caterpillars have hairs which can provoke allergic reactions and respiratory problems when handled. Any Oak trees, either planted or pre-existing, that are found to have Oak Processionary Moth present will not be used/destroyed under supervision of the on-site ECoW. This is critical for preventing the potential spread of this species into the pNHA woodland.

4.6.4.2 Wildflower Meadow Management

The loss of large areas of dry meadow and grassy verges during the pre-enabling/construction phases will result in an overall loss of these grassland habitats across the site. However, within the proposed development's landscape plans are several areas of native meadow/managed grassland areas, including within the existing lawn to the east of the adolescent building alongside the southern and western borders of this building, and around the proposed pond area. In addition, grassland will be created within the green roofs of the southern hospital building using soil excavated from the woodland donor site during the pre-enabling phase.

The natural regeneration of wildflower meadows within these areas can be achieved through suitable management techniques. The addition of key species, namely Yellow Rattle *Rhinanthus minor* will promote more diverse flowering meadows. This will provide pollen for pollinators and food sources for other invertebrates such as caterpillars. Encouraging invertebrates to visit the site with a meadow will increase foraging opportunities for local birds and bats.

It is also recommended that actions from the All-Ireland Pollinator Plan be implemented through the operation and management of the site, specifically for the proposed meadows areas, including within the existing lawn to the east of the adolescent building alongside the southern and western borders of this building, and around the proposed pond area. Measures outlining pollinator-friendly management for businesses are detailed in the guidance document: Businesses » All-Ireland Pollinator Plan.

Some of the measures outlined include:

- Appropriate mowing regimes;
- Creation of short and long grass meadows;
- Pollinator friendly planting;
- Provision of wild pollinator nesting habitat; and
- Eliminating or reducing the use of pesticides.

4.6.4.3 Green Roofs

Following the completion of the construction of the southern hospital buildings, the excavated material from the translocated woodland donor site will be used to create green roofs. This material, once it has been translocated to the roofs, will have limited access to nutrients and will be relatively thin. This will allow forbs and herbs to be more competitive with grass species within the seed bank, creating a low nutrient, high diversity grassland in the first years of the development. Regular biodiversity friendly management of this green roof will be required, much like any lawn. This will increase the species diversity of the green roof to a higher level than the existing grassland areas and will provide a more diverse source of nectar for local pollinators as well as other invertebrates and local birds.

The management of the green roofs will follow the same measures outlined above for the other managed grassland areas within the site, including the addition of key species, namely Yellow Rattle *Rhinanthus minor*, as well as appropriate management regimes, preventing/minimising the use of pesticides, and pollinator friendly planting.

4.6.4.4 Pine Marten Box

Due to the loss of an area of the pNHA woodland during the construction phase, and subsequent ecological lag in terms of the maturation of the landscaped woodland habitat to the north of the southern hospital building, it is recommended that a Pine Marten box be installed on site to encourage this species to keep utilizing the site during the operational phase. These boxes are typically used as shelter from poor weather, provide a daytime resting resource, provide above-ground safe areas to avoid predation from local foxes, and provide an area where Pine Marten can safely raise and nurture their young kits. The Pine Marten box should be placed within a suitable mature Sycamore, which will avoid damaging the barks of the native and naturalised mature trees, away from any road network and high footfall areas. Den boxes can be both constructed following the construction template from the Vincent Wildlife Trust (2014) or purchased through companies such as The Nestbox Company (<http://www.nestbox.co.uk/>).

Maintenance of the box itself must be undertaken every 3 years to preserve the box for as long as possible as it may be an expensive initial investment. Painting the outside of the box is recommended to limit the effects of weathering, as well as adjusting the cable keeping the box on the tree to stop the tree growing around the cable.

4.6.4.5 Hedgehog Hibernacula

In the interest of offsetting the loss of refuge resources for Hedgehog during the initial operational phase, it is recommended Hedgehog hibernacula are placed within the shrub habitats present on site. These can be created from a spare planter or wooden storage boxes and should ideally be placed away from any roads and hidden by groundcover to minimise disturbance.

4.6.4.6 Bat Boxes

In the interest of enhancing the site for local bats (i.e., pipistrelles and Leisler's Bat) a minimum of six bat boxes should be installed on-site. If possible, these bat boxes should be south-facing and at least 4m off the ground. If erecting on a building, erect as close as possible to the eaves of the building, and if possible, on a building located adjacent or close to a treeline. If erecting on a mature tree, the placement must be free from ivy with no branches within a 1m radius around the location of the box.

Within the Irish context, the Vincent's Wildlife Trust's reporting on Irish Bat Box schemes highlighted that 1FF Schwegler boxes (Fig 4.22 below) are recommended for by pipistrelle spp., whereas Leisler's Bat displayed no preference for bat box type (McAney and Haniffy, 2015), therefore the 1FF Schwegler boxes will be suitable to house all bat species which frequent the site.

Appropriate locations for bat boxes within the site include mounted on a pole, facing southwards, within the pond to the northeast of the site. This box should be placed a suitable distance from the banks to prevent members of the public disturbing the box. Bat boxes can also be placed within a wooded section to the east of the proposed adolescent building. Additional bat boxes can be placed to the west of the pond area. These areas will remain dark during the site's operational phase.

1FF
 Height: 43 cm
 Depth: 14 cm
 Width: 27 cm
 Entrance: 12–24 cm wide
 x 21 cm long
 Weight: 9.9 kg



Figure 4-22: 1FF Schwegler Bat Box with dimensions (abstract from McAney and Hanniffy, 2015)

4.6.4.7 Bird Boxes

Within the proposed development's landscape plans there is an expected ecological lag for the breeding birds that utilise the woodland, mitigating for this ecological lag can be achieved with the placement of bird boxes for the species that will be impacted (i.e., Greenfinch, Goldcrest, Linnet, Spotted Flycatcher). Greenfinch, Goldcrest, Linnet and Spotted Flycatcher are not picky with their nest boxes and multiple of the same box can be placed to provide these nesting opportunities.

Bird boxes can be hung from the trees on site, facing a north-eastern direction, angled slightly forward to repel rain, and at a height of 2-3 metres off the ground to avoid potential predation. These boxes should also not be placed immediately adjacent to any lighting fixtures as direct lighting can confuse birds. The most suitable locations to the north of the site include the following locations; the west of the adolescent building, to the east of the adolescent building within a garden space, and around the landscaped pond to the east of this building. Bird boxes can also be placed within the trees to the west of the southern building, along the site's southwestern border.

Barn Swallow, House Martin, and Swift

To provide nesting opportunities for Barn Swallow and House Martin which have been recorded on site, it is recommended that nest boxes are incorporated into the design of the new buildings. There are multiple options to choose from depending on the design style of the proposed development's construction plans. These must be on outward facing walls and not part of the courtyards within the new complex, ideally with clear entrance flight paths, nearby treelines are not a necessity for placement of Swallow or House Martin boxes. Positioning for House Martins must be at least 3m off the ground and placed underneath eaves, consideration of droppings is required so positioning of ledges to keep walls and ground underneath clear is recommended,

In addition, the installation of Swift bricks into the proposed development where practicable will provide nesting opportunities for the Red-listed bird species Common Swift. Swifts typically prefer existing holes or cracks within buildings for nesting as opposed to typical bird boxes.

The following guidance for the installation of Swift bricks will be followed:

- Swift bricks should be installed a minimum of 5m above the ground.
- Bricks should be installed in blockwork or brickwork walls, ideally placed high in gables, flank walls, and ends of terraces.
- Entrances should be obstructed by trees, ladders, creepers, or window cleaning gear.
- Install Swift bricks in areas out of constant sunlight and not directly above windows. Ideally in Ireland, this means they should be north or east facing.
- Nest bricks should be kept between 50-100cm apart.

- Bricks should be installed in a straight line, or in a pattern, under the eaves or across a vertical wall, away from windows.
- Between 2 to 4 bricks should be installed per house, and 4 to 10 per apartment block.

Bricks can be made to match any brick size, and can be made from synthetic boards and brick, and galvanised steel and brick. Swift bricks do not require any maintenance or cleaning, as Swifts do not leave piles of droppings. Additionally, other protected bird species have been previously recorded nesting within Swift bricks, including the amber-listed bird species House Sparrow and House Martin (Swift Conservation, 2026). In these cases, the bricks will need cleaning outside the breeding bird season when they are no longer in use.

Appropriate locations within the adolescent unit includes a section along the main unit's eastern flank. Areas should not be obstructed by any trees and should be away from the lighting along the access route to the north. Additionally, other suitable areas include sections of north facing wall of the adolescent unit, which are directly adjacent to a hedgerow. Bricks should be placed above the hedgerows and should not be obstructed so as not to block access. Swift bricks along the eastern flank should also not be blocked by any tree cover. Potential locations for Swift Bricks within the southern building include along the northernmost wall facing the woodland. Areas should not be near windows or obstructed by trees.

Once Swift bricks are installed, attraction callers will be used to help Swifts find the bricks. This will strictly follow the guidance outlined by Swift Conservation Ireland and will require additional approval from NPWS. Calls will only be played between 1st May and 31st August inclusive when migratory Swift populations are present. The attraction call systems will be placed in waterproof boxes with holes drilled in the bottom and will be placed within a metre of a nest box but will not be directly attached to the nest box itself. The speaker box will be positioned with the drilled holes facing downwards to prevent rain from damaging the speaker (Huxley, 2022). The amplifier will be installed indoors next to a power supply. The speaker wire will be connected to the back of the amplifier, and the Calls are pre-loaded onto the SD card. On the dials at the front of the amplifier, the base will be dialled to 0 and the treble dialled to maximum. The volume will be set to no more than $\frac{3}{4}$.

Swift Conservation Ireland's installation guidance provides more detailed steps on setting up swift attraction call systems, as well as where to source the systems from, available on their nest box guidance page: <https://www.swiftconservation.ie/nest-box-advice/>.

4.6.4.8 Insect Hotels

The clearance of the existing artificial structures on site, stonewall restoration works, loss of meadow and recolonising habitats, and the removal of a section of woodland will lead to a loss of nesting habitat for local terrestrial invertebrate species. While the relocation of a section of woodland and pond creation will create alternative nesting resources for terrestrial invertebrates, additional measures will be implemented to further remedy this loss, including the installation of insect refugia on the proposed green rooves on top of the southern building. Refugia can include log and leaf piles, as well as stone piles and old bricks with holes in them and should ideally be placed in locations that do not impede building maintenance so as to minimise future disturbance.

4.6.4.9 Bee Bricks

To create nesting resources for local solitary bee species, it is recommended bee bricks be installed within the proposed house and apartment block. Bee bricks contain cavities that are ideal for nesting space for solitary bees. These bricks require minimal internal maintenance.

The following guidance is recommended for the installation of bee bricks (Green & Blue, 2026):

- Bricks will be generally south facing, placed in warm sunny spots.
- Bricks will be placed at least 3m off the ground to avoid human interference.
- Bricks should be placed in the vicinity of potential food sources, such as flower beds and grassland areas

Ideal locations for bee bricks within the adolescent unit include unshaded section of the south facing side the building. There are food sources near this area (native meadow). An additional

section includes an area to the east of the adolescent unit within the south facing side adjacent to a lawn area. There is adequate sunlight and food sources to support local bee species. There are less areas suitable for bee bricks within the southern building, however, there is a corner of the building to the west which is south facing and adjacent to a swale area, where there are adequate food sources and light to support bee species. There is a section of the southern building along the site's eastern border which is south facing. Unshaded sections of the south facing section of this building are suitable for bee bricks.

4.6.4.10 Operational Monitoring Plan

On completion of the construction phase and creation of the landscaped habitats, the following long-term monitoring plans will be carried out for the most sensitive ecological receptors, to assess the efficacy of the outlined mitigation and management measures;

- Monitoring of the retained pNHA woodland within the site, following methodology outlined within the National Survey of Native Woodland 2003-2008 (Perrin et al., 2008a, Perrin et al., 2008b), which is summarised in the pre-construction sub section 4.6.2.1. Monitoring surveys will be conducted yearly for a period of 20 years following the completion of the construction phase. This will be conducted in addition to the ongoing monitoring of the translocated pNHA woodland.
- To assess and ensure efficacy of mitigation and management measures with regards to Badgers, the woodland habitat within the site will be monitored (re-surveyed) annually for the first 5 years to ensure Badger populations are still extant and active. If an absence of Badger is noted, additional measures must be considered in consultation with NPWS and the Fingal Biodiversity Officer to improve the suitability of the habitats and reduce disturbance around the proposed Hospital. While the northern wing of main hospital campus intrudes upon the pNHA woodland area, where Badger activity has been noted, the outward facing rooms with windows into the woodland will not be utilised from late dusk till dawn year-round so that these rooms do not generate lighting disturbance impacts on the local Badger when they are utilising this section of woodland.
- Monitoring of bats will be conducted during the operational phase with measurements of light spill into the pNHA woodland and created pond and grassland area recorded. This will be completed over five consecutive summer seasons post construction works, as per best practice (Marnell et al 2022 & Reason, P.F. and Wray, S. (2025)). The features to monitor for this consecutive summer monitoring includes: check new bat boxes are being utilised, commuting routes are still being used, specified lighting levels are followed, if any existing roosting features within the retained stonewall sections are being actively used as roosts, that features to increase value for bat activity have been successful or if the increased level of human activity along the route is displacing the bats. Some features, such as bat boxes, have a delay in their uptake in utilisation, which will be reflected in the initial years of bat monitoring. In the event that the lighting levels are found to be significantly higher than the levels specified in the lighting and/or is found to be significantly disturbing local bats/nocturnal mammals, additional measures will be considered to reduce lighting impacts.
- Monitoring of bird will be conducted during the operational phase, completed over five consecutive summer seasons post construction works, with a particular focus on the uptake of the artificial nesting features, namely bird boxes and bricks.
- Following the completion of the construction phase, invasive non-native species will be monitored for the duration of the site's operational phase, with a particular emphasis on the pNHA woodland between the two Hospital buildings. The invasive species management plan will outline the long-term management and monitoring of all invasive species, with a particular focus on widespread species such as Cherry Laurel and Butterfly-bush which have the potential to reduce the effectiveness of the woodland relocation.

All post construction monitoring will be devised and conducted by a suitably qualified ecologist in consultation with NPWS and the Fingal County Biodiversity Officer.

4.7 Residual Impacts

4.7.1 Liffey Valley pNHA [000128] [National]

Due to the encroachment into the boundary of the Liffey Valley pNHA there is an unavoidable permanent impact on the habitats, flora and fauna associated with the Liffey Valley pNHA. The mitigations for the translocation of the existing woodland soil and flora may allow for the habitats impacted to be established elsewhere within the site, however; this mitigation cannot be guaranteed to succeed due to the complexity of woodland conditions and relationships. Even in the event of a total success from the proposed mitigations, the woodland structure and ecological functionality may take decades to begin to resemble that of the woodland that is currently on site.

Therefore, considering the mitigations outlined in this report, it is anticipated that an **irreversible permanent adverse residual impact of moderate significance** is anticipated for the habitats, flora and fauna associated with the Liffey Valley pNHA.

4.7.2 Stone walls and other stonework [High Local]

The ecological value of this habitat is the refuge for flora, birds and invertebrates, as well as nesting potential for both local birds and invertebrate populations. The areas of this habitat that currently utilised by birds and other faunal groups for nesting and refuge habitat are to be lost due to the proposed development. Mitigations will include compensation for this loss in the form of nest boxes, nest bricks, insect hotels, and bee bricks.

Although the mitigations may be able to replace the functionality of this habitat for bird and invertebrate populations, the loss of old stone walls and other stonework as a substrate for flora within the site will not be able to be replaced.

Therefore, considering the mitigations outlined in this report, it is anticipated that a **long-term adverse residual impact of slight significance** is anticipated for this habitat.

4.7.3 Buildings and artificial surfaces [High Local]

The renovation of the historic farm buildings to facilitate the proposed development will result in the loss of roosting and nesting features for local bird populations, as well as commuting, foraging and roosting for local bat populations. The mitigations implemented for this proposed development will try to address the loss of this nesting, roosting, and foraging potential, however; it will not replace the ecological complexity of the existing historic buildings.

Therefore, considering the mitigations outlined in this report, it is anticipated that a **permanent adverse residual impact of slight significance** is anticipated for this habitat.

4.7.4 Mosaic: Spoil and bare ground / Dry meadows and grassy verges [Low Local]

This mosaic habitat is to be removed and will not be replaced within the proposed development. However, this habitat has low ecological value, and its loss is not expected to significantly impact local flora and fauna. Additionally, the creation of several meadow areas within the landscape plan and the subsequent management measures outlined will create higher value habitats during the operational phase that will negate any associated loss of floral diversity/resources for fauna.

Therefore, a **permanent adverse impact of profound significance** is anticipated for this mosaic habitat type. However, its loss will be mitigated by the creation of higher value meadow habitat within the landscape plan.

4.7.5 Mosaic: Recolonising bare ground / Scrub [High Local]

The recolonising bare ground habitat for this mosaic is to be permanently replaced, therefore removing this habitat from the site of the proposed development. However, the scrub sections of this mosaic habitat will be replaced as part of the landscape plan, increasing the overall area of scrub habitat during the operational phase.

Therefore, in consideration of the mitigations outlined in this report, it is anticipated that a **permanent adverse residual impact of profound significance** is anticipated for this mosaic habitat. However, the functionality of this habitat will be replaced with other habitat mitigations for the site.

4.7.6 Drainage ditches [High Local]

The existing drainage ditch within the site for the proposed development will not be encroached on by the proposed development. Any additional surface water run-off from the proposed development will be directed toward the SuDS incorporated within the site and therefore not impact the existing drainage.

Therefore, in consideration of the mitigations and design for the proposed development, **no residual impact** is anticipated for this habitat

4.7.7 Amenity grassland (improved) [Low Local]

There will be an overall increased in amenity grassland within the proposed development as part of the landscape plan.

Therefore, a **long-term positive residual impact of no significance** is anticipated for this habitat.

4.7.8 Mosaic: improved agricultural grassland/dry meadow and grassy verges [High Local]

This mosaic habitat will be lost as the site will no longer be used for agricultural purposes, management of the grassland sections will either result in amenity grassland or dry meadow and grassy verge habitats.

Therefore, in consideration of the mitigations outlined in this report, a **permanent adverse residual impact of profound significance** for this habitat is anticipated. However, its loss will be mitigated by the creation of higher value meadow habitat within the landscape plan.

4.7.9 Dry meadow and grassy verges [High Local]

As part of the landscape plan for the proposed development, there is an area of meadow to be managed. This will replace the meadow that is lost for the pond and woodland creation. The green roofs to be implemented will also function as this habitat in terms of forage, refuge and nesting potential for local faunal populations.

Therefore, in consideration of the mitigations outlined in this report and the design of the proposed development, a **long-term positive residual impact of slight significance** is anticipated for this habitat.

4.7.10 (Mixed) broadleaved woodland [National/County]

Within the landscape plan a new woodland is planned to be incorporated into the proposed development. However, as outlined in the operational impact section, it takes decades for woodland structure and functionality to establish. It is anticipated that the cover of mixed broadleaved woodland will be reduced as part of the proposed development.

Therefore, in consideration of the mitigations outlined in this report, a **permanent adverse residual impact of moderate significance** is anticipated for this habitat.

4.7.11 Mixed broadleaved / conifer woodland [High Local]

This habitat is to be retained as currently existing, with a native hedgerow to be planted along the western boundary which will increase species diversity.

Therefore, a **long-term positive residual impact of slight significance** is anticipated for this habitat.

4.7.12 Hedgerows [High Local]

Overall, the amount of hedgerow habitat within the site of the proposed development will be increased. Once established post construction, these hedgerows will require management as outlined in the mitigation.

Therefore, a **long-term positive residual impact of slight significance** is anticipated for this habitat.

4.7.13 Treelines [High Local]

As part of the landscape plans, treelines will be installed along the parking and amenity areas for the proposed development.

Therefore, a **long-term positive residual impact of moderate significance** is anticipated for this habitat.

4.7.14 Scattered trees and parkland [Low Local]

The section of scattered trees and parkland will be retained as part of the landscape plan for the proposed development, management of the meadow to be incorporated will enhance the diversity of this habitat.

Therefore, a **long-term positive residual impact of slight significance** is anticipated for this habitat.

4.7.15 Scrub [High Local]

As part of the landscape plan, sections of scrub are to be planted to ensure vegetation cover for various faunal groups.

Therefore, a **long-term positive residual impact of slight significance** is anticipated for this habitat.

4.7.16 Hairy St John's Wort [National]

No impact on this floral species is anticipated as part of this proposed development, the mitigations outlined in the report will ensure that no works are carried out that could cause an adverse impact on this species.

Therefore, **no residual impact** is anticipated for this species.

4.7.17 Non-volant Mammals [National / County / High Local]

Following the implementation of the construction and operational stage ecological mitigation measures and temporary ecological lag (maturation of landscape and translocated habitats), and considering increased operational disturbance levels, a **long-term adverse residual impact that is not significant** is anticipated for local Pine Marten, while a **long-term adverse residual impact of slight significance** is anticipated for local Badger and Hedgehog.

4.7.18 Bats [County]

Following the implementation of the construction and operational stage ecological mitigation measures and temporary ecological lag (maturation of landscape and translocated habitats) and considering the introduction of lighting features within the site, a **long-term adverse impact of slight significance** is anticipated for bats.

4.7.19 Breeding Birds [High Local]

Following the implementation of the construction and operational stage ecological mitigation measures and temporary ecological lag (maturation of landscape and translocated habitats), a **long-term positive residual impact of slight significance** is anticipated for breeding birds.

4.7.20 Wintering Birds [High Local]

Following the implementation of the construction and operational stage ecological mitigation measures and temporary ecological lag (maturation of landscape and translocated habitats), a **long-term positive residual impact of slight significance** is anticipated for wintering birds.

4.7.21 Amphibians [High Local]

Following the implementation of the construction and operational stage ecological mitigation measures and temporary ecological lag (maturation of landscape and translocated habitats), a **long-term positive residual impact of moderate significance is anticipated for amphibians.**

4.7.22 Fish [County/High Local]

Following the implementation of the construction and operational stage ecological mitigation measures and temporary ecological lag (maturation of landscape and translocated habitats), a **long-term neutral residual impact** is anticipated for fish.

4.7.23 Terrestrial Invertebrates [High Local]

Following the implementation of the construction and operational stage ecological mitigation measures and temporary ecological lag (maturation of landscape and translocated habitats), a **long-term positive residual impact of moderate significance** is anticipated for terrestrial invertebrates.

Table 4-13: Summary of KER Impact Assessment, Mitigations and Residuals

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
Liffey Valley pNHA [000128]	National	Construction Phase: Following a surface water or groundwater pollution events, surface water pollutants (hydrocarbons) may be transported downstream within the north-eastern drainage ditch to other sections of the pNHA and River Liffey, which has the potential to degrade overall water quality and impact local faunal and floral groups. The introduction of sediment via surface water run-off or dust settlement has the potential to degrade the water quality of the northeastern drainage ditch and downstream sections of the River Liffey, including sections within pNHA. There is a range of aquatic flora and fauna associated with the pNHA that will be vulnerable to excessive nutrient-based pollution due to the introduction of sediment, which can have knock-on adverse effects on local population dynamics within downstream sections of the River Liffey. Direct loss of a small section of pNHA woodland habitat. Retained sections of woodland	Construction Phase: Temporary to permanent adverse impacts of moderate significance. Operational Phase: Permanent adverse impact of moderate significance	Pre-enabling phase: The measures outlined in sub-sections 4.6.2.1, 4.6.2.2, 4.6.2.4 detailing pre-enabling work ecological surveys, woodland sods relocation, and the hoarding off retained sections of woodland. Construction Phase: Appropriate measures to reduce direct habitat impact and degradation from the location of the site compound and associated materials outlined in sub-section 4.6.3.2. Appropriate surface water and groundwater quality control measures, pollution control measures, and measures to protect the local drainage ditch set out in sub-sections 4.6.3.3, 4.6.3.6, and 4.6.3.7. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 4.6.3.4 and 4.6.3.8. The measures outlined in sub-section 4.6.3.10 regarding appropriate construction phase lighting. The measures outlined in sub-section	Irreversible permanent adverse residual impact of moderate significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		will be vulnerable to pollutant spills, root compaction and limb breakage via the operations of heavy-machinery, and damage to the woodland's existing mycelium network. Air (dust) pollution has the potential to negatively impact this pNHA by adversely impacting the photosynthetic capabilities and biological functions of local flora. Cement based dust pollutants have the potential to affect the pH of local waterbodies impacting upon aquatic flora and fauna, as well as impact upon local riparian birds via accidental ingestion during foraging and preening. Increased vehicular presence will lead to an increase in nitrogen oxides (NOx) emissions, which can lead to changes in pH of local surface water bodies, causing knock-on impacts on aquatic fauna and floral. Direct physical impact to associated fauna with accidental physical disturbance impacts, resulting in injury and potential fatalities (e.g. road collision between Badger and site vehicle). Operational Phase:		4.6.3.11 set out to prevent tree root compaction and limb damage. The construction phase ecological monitoring outlined in sub-section 4.6.3.12. Operational Phase: The guidance outlined in sub-section 4.6.4.1 pertaining to the planting of trees within the site. Biodiversity enhancement measures set out in sub-sections 4.6.4.4, 4.6.4.5, 4.6.4.6, 4.6.4.7, 4.6.4.8, and 4.6.4.9, which include the compensatory installation of a Pine Marten box, Hedgehog hibernacula, bat boxes, bird boxes/bricks, insect hotels, and bee bricks to mitigate the loss of refuge resources due to construction phase habitat removal. The operational monitoring plans set in sub section 4.6.4.10.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Direct loss of woodland habitat associated with the Liffey Valley pNHA as part of the proposed development. SuDS elements within the operational drainage layout, including attenuation / infiltration tanks and petrol interceptors, will provide surface water attenuation, infiltration, and in-situ retention of sediments, metals, and hydrocarbons, preventing impacts on the Liffey Valley pNHA via the surface water (surface water drainage infrastructure outflow) and groundwater pathway.			
Stone walls and other stonework	High Local	Construction Phase: Temporary and long-term habitat loss/or degradation of stone wall and other stonework structures across the site. Repair works to retained sections of the stone walls will ultimately lead to the removal of stone wall flora, infilling of potential bird nesting or bat-roosting mortar cavities between bricks, and infilling of smaller bore-like holes within stone / bricks that have the potential to support mining bee and solitary bee species. Retained stone wall habitats	Construction Phase: Long-term adverse impact of slight significance Operational Phase: Initial long-term adverse impact of slight significance	Pre-enabling phase: The measures outlined in sub-section 4.6.2.1 detailing pre-enabling work ecological surveys, including the surveying of the roosting features identified within the stone walls habitat. Construction Phase: Appropriate measures to reduce direct habitat impact and degradation from the location of the site compound and associated materials outlined in sub-section 4.6.3.2. Appropriate surface water and groundwater quality control measures and pollution control measures set out in sub-sections 4.6.3.3 and 4.6.3.6.	Long-term adverse residual impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		vulnerable to degradation due to accidental damage by hand or machinery, which has the potential to damage/remove floral species, bird nests and potential bat roosting features. Air (dust) pollution has the potential to negatively impact this habitat, adversely impacting photosynthesis and the biological functions of stonewall flora. Operational Phase: Retained stone wall sections incorporated into the project will support reduced floral assemblages and refuge / nesting capacity for local faunal groups. Newly constructed stone wall will be colonised by local flora during the initial operational phase.		A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 4.6.3.4 and 4.6.3.8. Operational Phase: Biodiversity enhancement measures set out in sub-sections 4.6.4.6, 4.6.4.7, 4.6.4.8, and 4.6.4.9, which include the compensatory installation of bat boxes, bird boxes/bricks, insect hotels, and bee bricks to mitigate the loss of refuge resources due to the demolition/refurbishment of the stonewalls on site. The operational monitoring plans set in sub section 4.6.4.10.	
Buildings and artificial surfaces	High Local	Construction Phase: Demolitions, alterations, and refurbishment to the existing buildings on site will result in habitat loss and degradation. The refurbishment and alterations to retained structures will ultimately remove their ecological value through the removal of external stone wall flora, infilling of potential bird-nesting or bat-roosting mortar cavities, and the infilling of	Construction Phase: Long-term adverse impact of slight significance Operational Phase: Initial permanent adverse impact of slight significance	Pre-enabling phase: The measures outlined in sub-section 4.6.2.1 detailing pre-enabling work ecological surveys, including the surveying of the roosting features identified within the existing buildings. Construction Phase: Appropriate measures to reduce direct habitat impact and degradation from the location of the site compound and	Permanent adverse residual impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		smaller bore-like holes within the stone / bricks that potentially support mining bees and solitary bee species. Retained historic buildings vulnerable to degradation due to accidental damage by hand or machinery, which has the potential to damage/remove floral species, bird nests and potential bat roosting features. Air (dust) pollution has the potential to negatively impact this habitat, adversely impacting photosynthesis and the biological functions of flora within the retained buildings' external stone walls. Operational Phase: Retained buildings will support reduced floral assemblages and refuge / nesting capacity for local faunal groups, while the implementation of SuDS green roof features into the newly constructed buildings will support meadow-aligned flora.		associated materials outlined in sub-section 4.6.3.2. Appropriate surface water and groundwater quality control measures and pollution control measures set out in sub-sections 4.6.3.3 and 4.6.3.6. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 4.6.3.4 and 4.6.3.8. Operational Phase Biodiversity enhancement measures set out in sub-sections 4.6.4.6, 4.6.4.7, 4.6.4.8, and 4.6.4.9, which include the compensatory installation of bat boxes, bird boxes/bricks, insect hotels, and bee bricks to mitigate the loss of refuge resources due to the demolition/refurbishment of the existing buildings on site.	
Mosaic: Spoil and bare ground / Dry meadows and grassy verges	Low Local	Construction Phase: Habitat lost in its entirety. Operational Phase:	Construction Phase: Long-term adverse impact of profound significance	Pre-enabling phase: The measures outlined in sub-section 4.6.2.1 detailing pre-enabling work ecological surveys.	Permanent adverse impact of profound significance. However, its loss will be mitigated by the creation of higher value meadow

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Habitat cleared in full during the construction phase and there will be no operational habitats that will mirror this habitat combination.	Operational Phase: Initial long-term adverse impact of profound significance	Construction Phase: Appropriate measures to reduce direct habitat impact and degradation from the location of the site compound and associated materials outlined in sub-section 4.6.3.2. Appropriate surface water and groundwater quality control measures and pollution control measures set out in sub-sections 4.6.3.3 and 4.6.3.6. Operational Phase: Appropriate measures to the creation and management of the landscaped meadow and grassland habitats, as well as the created green roofs are set out in sub-sections 4.6.4.2 and 4.6.4.3.	habitat within the landscape plan.
Mosaic: Recolonising bare ground / Scrub	High Local	Construction Phase: Habitat lost in its entirety. Operational Phase: Habitat cleared in full during construction phase, however initial replication of habitat due to shrub planting within the first 1-2 years of the operational phase, after which point the recolonising element will be lost.	Construction Phase: Long-term adverse impact of profound significance Operational Phase: Initial long-term adverse impact of profound significance	Pre-enabling phase: The measures outlined in sub-section 4.6.2.1 detailing pre-enabling work ecological surveys. Construction Phase: Appropriate measures to reduce direct habitat impact and degradation from the location of the site compound and associated materials outlined in sub-section 4.6.3.2. Appropriate surface water and groundwater quality control measures and pollution control measures set out in sub-sections	Permanent adverse impact of profound significance. However, the functionality of this habitat will be replaced with other habitat mitigations for the site.

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
Drainage ditches	High Local	Construction Phase: Degradation of water quality within the drainage ditch due to the unintended introduction of surface water pollutants and excess sediment, as well as pollutants via the groundwater-to-surface water pathway. Introduction of dust-based pollution has the potential to degrade aquatic and bankside flora. Alkaline cement-based dust has the potential to impact the pH level of this habitat, potentially harming sensitive aquatic flora and fauna downstream. Accidental introduction of sediment via surface water run-off or dust settlement has the potential to degrade this habitat's water quality Operational Phase: Existing drainage ditch will be retained and will see an increase in its total length / area through the creation of multiple swales as well as lower sections of small bioretention basins within the site.	Construction Phase: Short-term adverse impact of moderate significance Operational Phase: Initial long-term positive impact of slight significance	4.6.3.3 and 4.6.3.6. Pre-enabling phase: No specific pre-enabling mitigation measures Construction Phase: Appropriate measures to reduce direct habitat impact and degradation from the location of the site compound and associated materials outlined in sub-section 4.6.3.2. Appropriate surface water and groundwater quality control measures, pollution control measures, and measures to protect the local drainage ditch set out in sub-sections 4.6.3.3, 4.6.3.6, and 4.6.3.7. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 4.6.3.4 and 4.6.3.8. Operational Phase No specific operational phase impacts.	No residual impact

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Incorporation of drainage ditches within the operational surface water design as SuDS features has the potential to result in periods of sub-optimal water quality, however proposed floral species planted within these habitats have been chosen for their pollution tolerant and bioremediation characteristics.			
Amenity grassland (improved)	Low Local	Construction Phase: Loss of 65% of amenity grassland habitat. The creation of grasscrete parking areas within the northern and southern development areas, and the establishment of amenity grassland areas within the walled garden during the later stages of the construction phase will see the return of similar amenity grassland floral assemblages to the site, though highly fragmented in structure and with lower floral density. Retained sections of the amenity grassland will be vulnerable to surface water / groundwater pollution. The accidental spillage of deleterious substances (e.g. hydrocarbons) has the potential adversely impact the physiological condition of amenity grassland flora, degrading the overall health and	Construction Phase: Long-term adverse impact of slight significance Operational Phase: Initial long-term positive impact that is not significant	Pre-enabling phase: No specific pre-enabling mitigation measures Construction Phase: Appropriate measures to reduce direct habitat impact and degradation from the location of the site compound and associated materials outlined in sub-section 4.6.3.2. Appropriate surface water and groundwater quality control measures and pollution control measures set out in sub-sections 4.6.3.3 and 4.6.3.6. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 4.6.3.4 and 4.6.3.8.	Long-term positive residual impact of no significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		ecological value of the habitat. Potential physical damage to amenity grassland habitat due to excessive footfall from workers present on site, compaction from construction machinery, and the stock-piling of temporary material. Adverse impacts due to dust pollution, with cement-based dusts degrading flora and dust settlement disrupting photosynthesis. Operational Phase: Slight increase in total area of amenity grassland across the site including retained sections to the north, highly fragmented grasscrete areas, and highly maintained grassland within the walled garden, with the new amenity grassland areas achieving near full maturity within the initial operational phase. SuDS features, including permeable paving; green roofs, grasscrete, swales; and bioretention basins will provide surface water run-off attenuation, infiltration, and in-situ retention of sediments, metals, and hydrocarbons, ensuring localised flooding during heavy rainfall		Operational Phase: Appropriate measures to the creation and management of the landscaped meadow and grassland habitats, as well as the created green roofs are set out in sub-sections 4.6.4.2 and 4.6.4.3.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		events does not lead to adverse impacts from urban run-off on retained and new amenity grassland habitat.			
Mosaic: improved agricultural grassland/dry meadow and grassy verges	High local	Construction Phase: Loss of 95% of this habitat. During the later stages of the construction phase, establishment of landscaped meadow strips to the south of the site will be insignificant in terms of the increased total of habitat area present within the site during the construction phase. Retained sections of this habitat will be vulnerable to surface water / groundwater pollution. The accidental spillage of deleterious substances (e.g. hydrocarbons) has the potential adversely impact the physiological condition of grassland flora, degrading the overall health and ecological value of the habitat. Potential physical damage to habitat due to excessive footfall from workers present on site, compaction from construction machinery, and the stockpiling of temporary material. Adverse impacts due to dust pollution, with cement-based dusts degrading flora and dust	Construction Phase: Very significant long-term adverse impact Operational Phase: After an initial short-term significant adverse impact, a long-term adverse impact of profound significance	Pre-enabling phase: No specific pre-enabling mitigation measures Construction Phase: Appropriate measures to reduce direct habitat impact and degradation from the location of the site compound and associated materials outlined in sub-section 4.6.3.2. Appropriate surface water and groundwater quality control measures and pollution control measures set out in sub-sections 4.6.3.3 and 4.6.3.6. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 4.6.3.4 and 4.6.3.8. Operational Phase: Appropriate measures to the creation and management of the landscaped meadow and grassland habitats, as well as the created green roofs are set out in sub-sections 4.6.4.2 and 4.6.4.3.	Permanent adverse residual impact of profound significance. However, its loss will be mitigated by the creation of higher value meadow habitat within the landscape plan.

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		settlement disrupting photosynthesis. Operational Phase: Landscape maintenance will result in retained sections of this habitat will transition into a dry meadow habitat during the initial operational phase, resulting in greater floral diversity and the of the agricultural grassland element of the mosaic habitat being lost.			
Dry meadow and grassy verges	High Local	Construction Phase: Loss of 60% of this habitat. During the later stages of the construction phase, landscaped meadow strips across the site will establish although initially with lower floral diversity and structural complexity than the existing dry meadow and grassy verges habitat. Retained sections of this habitat will be vulnerable to surface water / groundwater pollution. The accidental spillage of deleterious substances (e.g. hydrocarbons) has the potential adversely impact the physiological condition of grassland flora, degrading the overall health and ecological value of the habitat.	Construction Phase: Long-term adverse impact of moderate significance Operational Phase: Initial long-term positive impact that is not significant	Pre-enabling phase: The measures outlined in sub-section 4.6.2.2 detailing the retention of topsoil from the meadow habitat that will be cleared. Construction Phase: Appropriate measures to reduce direct habitat impact and degradation from the location of the site compound and associated materials outlined in sub-section 4.6.3.2. Appropriate surface water and groundwater quality control measures and pollution control measures set out in sub-sections 4.6.3.3 and 4.6.3.6. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce	Long-term positive residual impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Potential physical damage to habitat due to excessive footfall from workers present on site, compaction from construction machinery, and the stock-piling of temporary material. Adverse impacts due to dust pollution, with cement-based dusts degrading flora and dust settlement disrupting photosynthesis. Operational Phase: Minor increase in dry meadow habitat during the initial operational phase through the retention of existing dry meadows and formation of new meadows. SuDS features, including permeable paving; green roofs, grasscrete, swales; and bioretention basins will provide surface water run-off attenuation, infiltration, and in-situ retention of sediments, metals, and hydrocarbons, ensuring localised flooding during heavy rainfall events does not lead to adverse impacts from urban run-off on retained and new dry meadow habitat.		the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 4.6.3.4 and 4.6.3.8. Operational Phase: Appropriate measures to the creation and management of the landscaped meadow and grassland habitats, as well as the created green roofs are set out in sub-sections 4.6.4.2 and 4.6.4.3.	
(Mixed) broadleaved	National / County	Construction Phase:	Construction Phase:	Pre-enabling phase:	Permanent adverse residual impact of

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
woodland		Small woodland section lost and replaced by artificial surfaces. Retained sections of woodland will be vulnerable to the accidental spillage of deleterious substances which has the potential to adversely impact trees and understorey vegetation, as well as degrade the mycelium network, which have the potential to lower the overall health and biodiversity value of the retained sections of broadleaved woodland. Heavy machinery used on site has the potential to lead the compaction of the root systems of the ground flora, woodland trees, and mycelium hyphae, as well as cause direct physical damage to saplings and mature trees. Air (dust) pollution has the potential to adversely impacting the photosynthetic capabilities and biological functions of woodland flora. Increased vehicular presence will lead to an increase in nitrogen oxides (NOx) emissions, which can disrupt the composition of the fungi community composition within the woodland, and increase the prevalence of less beneficial fungi that are more	Temporary to permanent adverse impacts of moderate significance Operational Phase: Permanent adverse impact of moderate significance	The measures outlined in sub-sections 4.6.2.1, 4.6.2.2 and 4.6.2.4 detailing pre-enabling work woodland surveys, pre-enabling woodland sods relocation and the hoarding off retained sections of woodland. Construction Phase: Appropriate measures to reduce direct habitat impact and degradation from the location of the site compound and associated materials outlined in sub-section 4.6.3.2. Appropriate surface water and groundwater quality control measures and pollution control measures set out in sub-sections 4.6.3.3 and 4.6.3.6. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 4.6.3.4 and 4.6.3.8. The measures outlined in sub-section 4.6.3.11 set out to prevent tree root compaction and limb damage. The construction phase ecological monitoring outlined in sub-section 4.6.3.12. Operational Phase: The guidance outlined in sub-section	moderate significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		tolerant of pollution Spread of invasive non-native floral species via construction activities will displace native species via shading impacts. Operational Phase: SuDS features, including permeable paving; green roofs, grasscrete, swales; and bioretention basins will provide surface water run-off attenuation, infiltration, and in-situ retention of sediments, metals, and hydrocarbons, ensuring localised flooding during heavy rainfall events does not lead to adverse impacts from urban run-off on mixed broadleaved woodland.		4.6.4.1 pertaining to the planting of trees within the site. The operational monitoring plans set in sub section 4.6.4.10.	
Mixed broadleaved / conifer woodland	High Local	Construction Phase: Habitat retained during construction phase. Retained sections of woodland will be vulnerable to the accidental spillage of deleterious substances which has the potential to adversely impact trees and understorey vegetation, as well as degrade the mycelium network, which have the potential to lower the overall health and biodiversity value of the retained sections of broadleaved woodland.	Construction Phase: Temporary to long-term adverse impacts of moderate significance Operational Phase: Initial long-term positive impact that is not significant	Pre-enabling phase: No specific pre-enabling mitigation measures Construction Phase: Appropriate measures to reduce direct habitat impact and degradation from the location of the site compound and associated materials outlined in sub-section 4.6.3.2. Appropriate surface water and groundwater quality control measures and pollution control measures set out in sub-sections	Long-term positive residual impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Heavy machinery used on site has the potential to lead the compaction of the root systems of the ground flora, woodland trees, and mycelium hyphae, as well as cause direct physical damage to saplings and mature trees. Air (dust) pollution has the potential to adversely impacting the photosynthetic capabilities and biological functions of woodland flora. Increased vehicular presence will lead to an increase in nitrogen oxides (NOx) emissions, which can disrupt the composition of the fungi community composition within the woodland, and increase the prevalence of less beneficial fungi that are more tolerant of pollution Spread of invasive non-native floral species via construction activities will displace native species via shading impacts. Operational Phase: Habitat retained in full and will receive additions in the form of native hedgerow planting which will increase in floral diversity; however, the planted hedgerow		4.6.3.3 and 4.6.3.6. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 4.6.3.4 and 4.6.3.8. The measures outlined in sub-section 4.6.3.11 set out to prevent tree root compaction and limb damage. Operational Phase: The guidance outlined in sub-section 4.6.4.1 pertaining to the planting of trees within the site.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		will be in its infancy during the initial operational phase, and its woodland ecological functions will be very limited. SuDS features, including permeable paving; green roofs, grasscrete, swales; and bioretention basins will provide surface water run-off attenuation, infiltration, and in-situ retention of sediments, metals, and hydrocarbons, ensuring localised flooding during heavy rainfall events does not lead to adverse impacts from urban run-off on mixed broadleaved / conifer woodland.			
Hedgerows	High Local	Construction Phase: The hedgerow habitat will be cleared during the construction phase. Landscaped planting of new native hedgerows will lead to increase in length and diversity of hedgerows habitat but decreased in terms of maturity and ecosystem. Operational Phase: Hedgerows will increase in length and diversity but decrease in terms of maturity and ecosystem services provided to local fauna, during initial operational phase.	Construction Phase: Long-term adverse impact of moderate significance Operational Phase: Initial long-term positive impact that is not significant	Pre-enabling phase: No specific pre-enabling mitigation measures Construction Phase: Appropriate measures to reduce direct habitat impact and degradation from the location of the site compound and associated materials outlined in sub-section 4.6.3.2. Appropriate surface water and groundwater quality control measures and pollution control measures set out in sub-sections 4.6.3.3 and 4.6.3.6. A series of measures are proposed to	Long-term positive residual impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		SuDS features, including permeable paving; green roofs, grasscrete, swales; and bioretention basins will provide surface water run-off attenuation, infiltration, and in-situ retention of sediments, metals, and hydrocarbons, ensuring localised flooding during heavy rainfall events does not lead to adverse impacts from urban run-off on hedgerows.		reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 4.6.3.4 and 4.6.3.8. The measures outlined in sub-section 4.6.3.11 set out to prevent tree root compaction and limb damage. Operational Phase: The guidance outlined in sub-section 4.6.4.1 pertaining to the planting of trees within the site.	
Treelines	High Local	Construction Phase: Treelines to the north-east of the site retained. Western V-shaped treeline and south-eastern treelines will be removed in full bar one or two trees per treeline, leading to a loss of the habitat's function as a wildlife corridor. Treelines will be planted towards the end of the construction phase, which will increase the total length of treeline habitat present on site, however, these treelines will be immature and will not initially be able to provide the full range of ecosystem services for local faunal populations. Retained treelines will be vulnerable to the accidental	Construction Phase: Long-term adverse impact of slight significance Operational Phase: Initial long-term positive impact that is not significant	Pre-enabling phase: No specific pre-enabling mitigation measures Construction Phase: Appropriate measures to reduce direct habitat impact and degradation from the location of the site compound and associated materials outlined in sub-section 4.6.3.2. Appropriate surface water and groundwater quality control measures and pollution control measures set out in sub-sections 4.6.3.3 and 4.6.3.6. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce	Long-term positive residual impact of moderate significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		spillage of deleterious substances which has the potential to adversely impact trees and understorey vegetation, as well as degrade the mycelium network, which have the potential to lower the overall health and biodiversity value of the retained treelines. Heavy machinery used on site has the potential to lead the compaction of the root systems of the ground flora, trees, and mycelium hyphae, as well as cause direct physical damage to saplings and mature trees. Air (dust) pollution has the potential to adversely impacting the photosynthetic capabilities and biological functions of treeline flora. Increased vehicular presence will lead to an increase in nitrogen oxides (NOx) emissions, which can disrupt the composition of the fungi community composition within the treelines, and increase the prevalence of less beneficial fungi that are more tolerant of pollution. Operational Phase: Treelines will increase in length and diversity but decrease in		the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 4.6.3.4 and 4.6.3.8. The measures outlined in sub-section 4.6.3.11 set out to prevent tree root compaction and limb damage. Operational Phase: The guidance outlined in sub-section 4.6.4.1 pertaining to the planting of trees within the site.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		terms of maturity and ecosystem services provided to local fauna, during initial operational phase. SuDS features, including permeable paving; green roofs, grasscrete, swales; and bioretention basins will provide surface water run-off attenuation, infiltration, and in-situ retention of sediments, metals, and hydrocarbons, ensuring localised flooding during heavy rainfall events does not lead to adverse impacts from urban run-off on treelines.			
Scattered trees and parkland	Low Local	Construction Phase: The trees within this habitat will be retained in full while a small area of amenity grassland will be lost. Retained trees and grassland will be vulnerable to the accidental spillage of deleterious substances which has the potential to adversely impact trees and understorey vegetation, which has the potential to lower the overall health and biodiversity value of the retained parkland. Heavy machinery used on site has the potential to lead the compaction of the root systems of the ground flora and trees, as	Construction Phase: Medium-term adverse impact of slight significance Operational Phase: Initial long-term positive impact that is not significant	Pre-enabling phase: The measures outlined in sub-section 4.6.2.2 detailing the retention of topsoil from the meadow habitat that will be cleared. Construction Phase: Appropriate measures to reduce direct habitat impact and degradation from the location of the site compound and associated materials outlined in sub-section 4.6.3.2. Appropriate surface water and groundwater quality control measures and pollution control measures set out in sub-sections 4.6.3.3 and 4.6.3.6. A series of measures are proposed to	Long-term positive residual impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		well as cause direct physical damage to trees such as accidental breakage of tree limbs. Air (dust) pollution has the potential to adversely impacting the photosynthetic capabilities and biological functions of parkland flora. Operational Phase: Small increase in this habitat during initial operational phase; however new additions will still be immature with the planted trees not mature enough to support potential bat roosting, bird nesting and hive-building opportunities. SuDS features, including permeable paving; green roofs, grasscrete, swales; and bioretention basins will provide surface water run-off attenuation, infiltration, and in-situ retention of sediments, metals, and hydrocarbons, ensuring localised flooding during heavy rainfall events does not lead to adverse impacts from urban run-off on the scattered trees and parkland habitat.		reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 4.6.3.4 and 4.6.3.8. The measures outlined in sub-section 4.6.3.11 set out to prevent tree root compaction and limb damage. Operational Phase: The guidance outlined in sub-section 4.6.4.1 pertaining to the planting of trees within the site. Appropriate measures to the creation and management of the landscaped meadow and grassland habitats set out in sub-section 4.6.4.2.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
Scrub	High Local	Construction Phase: Scrub patch to the southwest lost in its entirety. The scrub strip bordering the eastern site boundary will have its southernmost section removed, while the scrub vegetation north of this point will be trimmed back along the boundary but will not be removed. The landscape planting of new native shrubs will lead to an increase in total scrub coverage across the proposed site as well as a slight increase in floral diversity. However, these scrub areas will not match the maturity of existing scrub to be cleared and will not provide a full range of scrub-based ecosystem services for local fauna. Retained scrub sections will be vulnerable to the accidental spillage of deleterious substances which has the potential to adversely impact shrub and tree species, as well as ground floral species, which has the potential to lower the overall health and biodiversity value of the retained scrub. Heavy machinery used on site has the potential to lead the compaction of the root systems of the ground flora, shrubs, and trees, as well as cause direct physical damage to shrubs and	Construction Phase: Long-term adverse impact of moderate significance Operational Phase: Initial long-term positive impact that is not significant	Pre-enabling phase: No specific pre-enabling phase mitigation measures. Construction Phase: Appropriate measures to reduce direct habitat impact and degradation from the location of the site compound and associated materials outlined in sub-section 4.6.3.2. Appropriate surface water and groundwater quality control measures and pollution control measures set out in sub-sections 4.6.3.3 and 4.6.3.6. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 4.6.3.4 and 4.6.3.8. The measures outlined in sub-section 4.6.3.11 set out to prevent tree root compaction and limb damage. Operational Phase: The guidance outlined in sub-section 4.6.4.1 pertaining to the planting of trees within the site.	Long-term residual impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		trees. Air (dust) pollution has the potential to adversely impacting the photosynthetic capabilities and biological functions of scrub flora. Spread of invasive non-native floral species via construction activities will displace native species via shading impacts. Operational Phase: Partial loss of scrub habitat will be offset by planting of native shrubbery, leading to an increase in total scrub coverage across the site during initial operational phase; however, the new shrub areas will be immature and will not provide a full range of scrub-based ecosystem services for local fauna SuDS features, including permeable paving; green roofs, grasscrete, swales; and bioretention basins will provide surface water run-off attenuation, infiltration, and in-situ retention of sediments, metals, and hydrocarbons, ensuring localised flooding during heavy rainfall events does not lead to adverse impacts from urban run-off on			

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		the scrub habitat.			

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
Protected Flora - Hairy St John's Wort	National	Construction Phase: Air (dust) pollution has the potential to adversely impacting the photosynthetic capabilities and biological functions of local flora. The Hairy St John's-wort population [Flora Protection Order (2022)], located 75m west of the site boundary, has the potential to be adversely impacted by the dust impacts. Operational Phase: No operational phase impacts anticipated.	Construction Phase: Short-term adverse impact of moderate significance Operational Phase: Initial long-term neutral impact that is not significant	Pre-enabling phase: The measures outlined in sub-sections 4.6.2.1, 4.6.2.2, and 4.6.2.4 detailing pre-enabling work ecological surveys, woodland sods relocation, and the hoarding off retained sections of woodland. Construction Phase: Appropriate measures to reduce direct habitat impact and degradation from the location of the site compound and associated materials outlined in sub-section 4.6.3.2. Appropriate surface water and groundwater quality control measures, pollution control measures, and measures to protect the local drainage ditch set out in sub-sections 4.6.3.3, 4.6.3.6, and 4.6.3.7. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 4.6.3.4 and 4.6.3.8. The construction phase ecological monitoring outlined in sub-section 4.6.3.12. Operational Phase: The operational monitoring plans set in sub section 4.6.4.10.	No residual impact

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
Non-volant Mammals	National / County / High Local	Construction Phase: Local non-volant mammals may be potentially adversely impacted by the spillage of deleterious substances, namely hydrocarbons, via direct ingestion of contaminated water, which has the potential to result in damaged lungs and/or carcinogenic effects for affected individuals. In the event that hydrocarbon and/or solvent pollutants reach the River Liffey downstream, local Otters may suffer from degraded furs, notably impacting the furs' insulative qualities resulting in physiological stress for any affected Otter. Potential ingestion of hydrocarbons by Otter as they groom affected fur can result in mortality via haemorrhagic gastroenteropathy. Groundwater and air (dust)-based pollution can result in the deterioration in quality and availability of prey items for local mammals. Bioaccumulation of toxic substances within local mammal populations due to the consumption of contaminated prey items, leading to carcinogenic effects and pulmonary stress.	Construction Phase: Temporary to short-term negative impact of slight significance Operational Phase: Initial long-term negative impact that is not significant for local Pine Marten. Initial long-term negative impact of slight significance for Badger and Hedgehog populations	Pre-enabling phase: The measures outlined in sub-sections 4.6.2.1, 4.6.2.2, 4.6.2.4 detailing pre-enabling work ecological surveys, woodland sods relocation, and the hoarding off retained sections of woodland. Construction Phase: Appropriate measures to reduce direct habitat impact and degradation from the location of the site compound and associated materials outlined in sub-section 4.6.3.2. Appropriate surface water and groundwater quality control measures, pollution control measures, and measures to protect the local drainage ditch set out in sub-sections 4.6.3.3, 4.6.3.6, and 4.6.3.7. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 4.6.3.4 and 4.6.3.8. The measures outlined in sub-section 4.6.3.10 regarding appropriate construction phase lighting. The measures outlined in sub-section 4.6.3.11 set out to prevent tree root compaction and limb damage.	Long-term adverse residual impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Short-term habitat loss resulting from the clearance of woodland, hedgerow, treeline, scrub and meadow habitats, reducing available foraging, commuting, denning, and hibernation resources for local Badger, Pine Marten and Hedgehog. Visual and audible disturbances to the foraging and commuting activities of local Badger, Pine Marten and Hedgehog. Potential mortality events may occur due to accidental trappings after failure to exclude entry and/or vehicular collisions within or adjacent to the construction site. Operational Phase: SuDS features, including permeable paving; green roofs, grasscrete, swales; and bioretention basins will provide surface water run-off attenuation, infiltration, and in-situ retention of sediments, metals, and hydrocarbons, ensuring direct surface water flows from localised flooding during heavy rainfall events are directed away from the existing drainage ditch safeguarding the River Liffey Otter population downstream. Creation of pond to the north-east of the site will create new foraging resources for local Otter		The construction phase ecological monitoring outlined in sub-section 4.6.3.12. Operational Phase: The guidance outlined in sub-section 4.6.4.1 pertaining to the planting of trees within the site. Biodiversity enhancement measures set out in sub-sections 4.6.4.4 and 4.6.4.5, which include the compensatory installation of a Pine Marten box and Hedgehog hibernacula, to mitigate the loss of refuge resources due to construction phase habitat removal. The operational monitoring plans set in sub section 4.6.4.10.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		potentially increasing their prevalence within the site, increasing the risk to Otter from road accident collisions; however foraging resources for Otter will be in greater availability downstream in the River Liffey, meaning the likelihood of this species navigating to the pond being small, meaning road collision risk for Otter will be very low. Lighting disturbance to local Badger, Hedgehog, and Pine Marten populations due to light spillage from outward facing rooms with windows within section of proposed hospital building facing into the pNHA woodland. Increased vehicular presence on site will lead to only minor increases in the risk of road accident collisions for local mammals due to low-speed limits. Minor habitat loss and fragmentation during operational phase. Landscaped green spaces will be less attractive to Badger but will provide refuge and foraging resources for Hedgehog. Retention of mature woodland structure will prevent impacts from habitat loss / fragmentation on local Pine			

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Marten population. SuDS features, including permeable paving; green roofs, grasscrete, swales; and bioretention basins will provide surface water run-off attenuation, infiltration, and in-situ retention of sediments, metals, and hydrocarbons, ensuring localised flooding during heavy rainfall events does not lead to adverse impacts from urban run-off on the habitats that support local Badger, Pine Marten and Hedgehog populations.			
Bats	County	Construction Phase: Long-term loss of potential bat roost features due to removal of old structures and trees. Direct lighting impacts due to construction-based lighting disrupting the foraging and commuting activities of local bats, as well as reducing total habitat availability due to excessive lighting and cutting off commuting routes along linear habitat features. Indirect lighting impacts through the disruption of the distribution and frequency of prey items. Additional lighting will attract wing-invertebrates away from	Construction Phase: Long-term adverse impact of moderate significance Operational Phase: Initial long-term adverse impact of moderate significance	Pre-enabling phase: The measures outlined in sub-sections 4.6.2.1, 4.6.2.2, 4.6.2.4 detailing pre-enabling work ecological surveys, woodland sods relocation, and the hoarding off retained sections of woodland. The measures outlined in sub-section 4.6.2.3 detailing the creation of the pond/wetland habitat, which will create foraging resources for local bat species. Construction Phase: Appropriate measures to reduce direct habitat impact and degradation from the location of the site compound and associated materials outlined in sub-section 4.6.3.2.	Long-term adverse impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		their usual host habitats, causing local bat species to commute to new foraging grounds or pursue their prey items into light impacted areas. Some bat species are adapted to urban landscapes, namely Common Pipistrelle, Soprano Pipistrelle and Leisler's Bat can congregate around urban street lighting feeding on nocturnal winged insects attracted to lower impact lighting. However, given that the long-term adverse impacts of higher streetlight luminance on affected invertebrate prey populations, all local bat species are ultimately negatively impacted by excessive / undimmed streetlight outputs. Short-term habitat fragmentation / loss due to removal of habitats and known commuting routes along linear hedgerows and treelines, reducing the availability of invertebrate prey species, thus reducing the foraging resources for local bat species. Degradation of local habitats via air (dust)-based emissions resulting in decreased frequency and contamination of bat prey items (invertebrates). The consumption of contaminated prey items may lead to bioaccumulation of toxic substances within the local bat		Appropriate surface water and groundwater quality control measures, pollution control measures, and measures to protect the local drainage ditch set out in sub-sections 4.6.3.3, 4.6.3.6, and 4.6.3.7. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 4.6.3.4 and 4.6.3.8. The measures outlined in sub-section 4.6.3.10 regarding appropriate construction phase lighting. The measures outlined in sub-section 4.6.3.11 set out to prevent tree root compaction and limb damage. The construction phase ecological monitoring outlined in sub-section 4.6.3.12. Operational Phase: The guidance outlined in sub-section 4.6.4.1 pertaining to the planting of trees within the site. The installation of bat boxes as outlined in sub-section 4.6.4.6, as well as the creation of artificial refuge resources for invertebrate prey species set out in sub-sections 4.6.4.8, and 4.6.4.9.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		populations, resulting in physiological stress and potential reduced fecundity. Operational Phase: Long-term loss of potential roosting features due to the clearance of mature trees and demolishing / refurbishment of buildings and stone walls for local Common Pipistrelle, Soprano Pipistrelle, Nathusius's Pipistrelle, Leisler's Bat and Brown Long-eared Bat populations during the initial operational phase. Creation of pond and wetland swale / bioretention basin habitats, alongside the diversification of floral communities within dry meadow and treeline habitats will support a greater diversity of invertebrate prey items. However, increase in artificial surface and lighting on site will likely slightly decrease diversity of prey items across the site, particularly during the initial operational phase when habitats are immature and not fully colonised by invertebrates. Habitat fragmentation during initial operational phase as landscaped dry meadow, hedgerow, and treeline habitats establish and mature within the		The operational monitoring plans set in sub section 4.6.4.10.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		site. Despite bat friendly lighting design, light spillover into habitats adjacent to the site will cause local bats avoiding illuminated habitats, effectively reducing the total available foraging and commuting habitat. Indirect lighting impacts through the disruption of the distribution and frequency of prey items. Additional lighting will attract wing-invertebrates away from their usual host habitats, causing local bat species to commute to new foraging grounds or pursue their prey items into light impacted areas. Some bat species are adapted to urban landscapes, namely Common Pipistrelle, Soprano Pipistrelle and Leisler's Bat can congregate around urban street lighting feeding on nocturnal winged insects attracted to lower impact lighting. However, given that the long-term adverse impacts of higher streetlight luminance on affected invertebrate prey populations, all local bat species are ultimately negatively impacted by excessive / undimmed streetlight outputs. SuDS features, including permeable paving; green roofs, grasscrete, swales; and			

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		bioretention basins will provide surface water run-off attenuation, infiltration, and in-situ retention of sediments, metals, and hydrocarbons, ensuring localised flooding during heavy rainfall events does not lead to adverse impacts from urban run-off on the habitats that support the foraging and commuting activities of local bat species.			

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
Breeding Birds	High Local	Construction Phase: Short-term to long-term loss of nesting resources for local breeding bird species due to loss of meadow, scrub and trees. Loss of foraging, refuge, and commuting habitat for local breeding bird population. Bird species that are more strongly associated with artificial structure, hedgerow, scrub and meadow habitats impacted most significantly. Local breeding birds will still be able to use the retained sections of the woodland habitat. Habitat loss and the degradation of the retained local flora via surface water, groundwater, or air-based pollutants have the potential to degrade foraging resources for local breeding birds. Temporary and long-term habitat loss, alongside the degradation of the retained habitats through direct physical or pollutant-based impacts, has the potential to result habitat fragmentation. Loss of cover / refuge has the potential to increase predation risk for local breeding bird species.	Construction Phase: Long-term negative impact of moderate significance Operational Phase: Initial long-term positive impact of slight significance	Pre-enabling phase: The measures outlined in sub-sections 4.6.2.1, 4.6.2.2, 4.6.2.4 detailing pre-enabling work ecological surveys, woodland sods relocation, and the hoarding off retained sections of woodland. Construction Phase: Appropriate measures to reduce direct habitat impact and degradation from the location of the site compound and associated materials outlined in sub-section 4.6.3.2. Appropriate surface water and groundwater quality control measures, pollution control measures, and measures to protect the local drainage ditch set out in sub-sections 4.6.3.3, 4.6.3.6, and 4.6.3.7. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 4.6.3.4 and 4.6.3.8. The measures outlined in sub-section 4.6.3.11 set out to prevent tree root compaction and limb damage. The construction phase ecological monitoring outlined in sub-section 4.6.3.12.	Long-term positive residual impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Breeding birds may ingest contaminated water during the construction phase, which can potentially result in reduced egg production and hatching, increased clutch or brood abandonment, reduced growth and increased organ weights. Degradation of local habitats via surface water, groundwater, and air (dust)-based emissions resulting in deterioration of food / prey items in the food chain for breeding birds. The consumption of contaminated prey items may lead to bioaccumulation of toxic substances within the local breeding bird populations, resulting in physiological stress and potential reduced fecundity. Temporary to short-term visual and audible disturbances to the foraging and commuting activities of local breeding birds leading to them abandoning the site. The clearance of vegetation within and adjacent to the works area will increase local breeding bird species alert distances as there will be less vegetation available for refuge. Audible disturbance during the construction phase has the potential to effect egg production, incubation, brooding, predators, brood parasites, and abandonment, as well as the		Operational Phase: The guidance outlined in sub-section 4.6.4.1 pertaining to the planting of trees within the site. The installation of bird boxes and bricks within the site as outlined in sub-section 4.6.4.7. The operational monitoring plans set in sub section 4.6.4.10.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		ability to find or attract a male. Operational Phase: Additional foraging and nesting resources for breeding birds due to increase in the length of treelines and hedgerows across the site, improved meadows which will support greater numbers of pollinators, and planting to extend the protected woodland and offset construction phase woodland section.			
Wintering Birds	High Local	Construction Phase: Habitat loss and degradation of retained habitats due to surface water, groundwater or air-based pollutants will make the site less suitable for wintering bird species. Hydrocarbon pollution accidentally introduced into the local surface water and groundwater networks may come into contact with wintering bird species navigating, foraging, drinking, or washing within waterbodies downstream of the site, resulting in physiological harm via direct contact or accidental ingestion. Wintering birds may ingest contaminated water during the construction phase, which can	Construction Phase: Long-term adverse impact of slight significance Operational Phase: Initial long-term positive impact of slight significance	Pre-enabling phase: The measures outlined in sub-sections 4.6.2.1, 4.6.2.2 and 4.6.2.4 detailing pre-enabling work ecological surveys of the woodland habitat, woodland sods relocation and the hoarding off retained sections of woodland. The measures outlined in sub-section 4.6.2.3 detailing the creation of the pond/wetland habitat, which will create foraging and refuge resources for wintering bird species. Construction Phase: Appropriate measures to reduce direct habitat impact and degradation from the location of the site compound and associated materials outlined in sub-section 4.6.3.2.	Long-term positive residual impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		potentially result in reduced egg production and hatching, increased clutch or brood abandonment, reduced growth and increased organ weights. Degradation of local habitats via surface water, groundwater, and air (dust)-based emissions resulting in deterioration of food / prey items in the food chain for wintering birds. The consumption of contaminated prey items may lead to bioaccumulation of toxic substances within the local wintering bird populations, resulting in physiological stress and potential reduced fecundity. Retained vegetation associated with wintering bird species, namely Woodcock and/or Redwing, will be within bird disturbance zone, which has the potential to lead to these species vacating the site as a result of physical, visual and/or noise disturbance. Operational Phase: Creation of new pond area will create new foraging and refuge resources for some wintering bird species, namely Mallard, and refuge resources for other species, namely Black-headed Gull. Removal of grassland due to loss of foraging and refuge		Appropriate surface water and groundwater quality control measures, pollution control measures, and measures to protect the local drainage ditch set out in sub-sections 4.6.3.3, 4.6.3.6, and 4.6.3.7. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 4.6.3.4 and 4.6.3.8. The measures outlined in sub-section 4.6.3.11 set out to prevent tree root compaction and limb damage. Operational Phase: The operational monitoring plans set in sub section 4.6.4.10, including the monitoring of woodland habitat which can support wintering bird species, such as Woodcock and Redwing.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		resources for Snipe and Redwing partially offset by proposed improved meadows. Creation of pond will create new foraging and refuge habitat for wintering bird species that have not been recorded within the locale, including species of conservation concern such as include Coot, Teal, Tufted Duck, and Wigeon.			
Amphibians	High Local	Construction Phase: Adverse impacts to local amphibians through the direct osmotic absorption of contaminated water within temporary waterbodies on site, due to the accidental release of deleterious substances. Degradation of local habitats via surface water, groundwater, and air (dust)-based emissions resulting in deterioration of food / prey items in the food chain for amphibians. The consumption of contaminated prey items may lead to bioaccumulation of toxic substances within the local amphibian populations, resulting in physiological stress and potential reduced fecundity. Physical disturbance to local amphibians through the removal of hibernation habitat within the	Construction Phase: Long-term adverse impact of slight significance Operational Phase: Initial long-term positive impact of moderate significance	Pre-enabling phase: The measures outlined in sub-sections 4.6.2.1, 4.6.2.2 and 4.6.2.4 detailing pre-enabling work ecological surveys of the woodland habitat, woodland sods relocation and the hoarding off retained sections of woodland. The measures outlined in sub-section 4.6.2.3 detailing the creation of the pond/wetland habitat, which will create foraging, nesting, and refuge resources for local amphibians. Construction Phase: Appropriate measures to reduce direct habitat impact and degradation from the location of the site compound and associated materials outlined in sub-section 4.6.3.2. Appropriate surface water and groundwater quality control measures, pollution control	Long-term residual impact of moderate significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		woodland, which may lead to mortalities or exposure to cold extremes during the winter which may prove fatal. Additional mortality events may occur via vehicular collisions when amphibians are commuting across active site routes, as well as accidental trapping within excavations or materials, after failure to exclude entry, which can also lead to injury or death. Construction activities have the potential to disturb the foraging and commuting activities of local amphibians within the site's retained habitats as well as habitats adjacent to the site. Clearance of amphibian refuge habitats creates an increased risk of predation or accidental trampling by construction vehicles or workers for local amphibians. Operational Phase: Creation of pond will provide breeding habitat for local amphibian species, and the relocation of woodland near this standing body of water will create foraging and refuge habitats for local amphibians within close proximity to breeding habitat, exposing amphibian species to less risk when		measures, and measures to protect the local drainage ditch set out in sub-sections 4.6.3.3, 4.6.3.6, and 4.6.3.7. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 4.6.3.4 and 4.6.3.8. The measures outlined in sub-section 4.6.3.11 set out to prevent tree root compaction and limb damage. The construction phase ecological monitoring outlined in sub-section 4.6.3.12, including the monitoring of amphibian supporting woodland habitat. Operational Phase: The operational monitoring plans set in sub section 4.6.4.10, including the monitoring of amphibian supporting woodland habitat.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		commuting from foraging to breeding habitat, increasing survivability.			
Fish	County	Construction Phase: Adverse impacts to local fish populations downstream of the site due to the accidental introduction of pollutants, such as hydrocarbons or excess sediment, into the local surface water network, leading to physiological impact via substance toxicity, degradation of spawning habitat downstream in the case of excessive sediment, and the depletion and/or degradation of prey items. Temporary to medium term adverse impacts on fish due to the exposure to hydrocarbons, solvents or lubricants accidentally introduced into the local surface water network, which may lead to physiological harm to local fish species due to the heavy metals within these substances passing through the gills or entering the digestive tract via ingestion of metal accumulated prey items. Exposure may lead to oxidative stress weakening the immune system of affected individuals, reduced fecundity, and growth defects.	Construction Phase: Temporary to short-term adverse impacts ranging from slight to moderate significance Operational Phase: Long-term neutral impact that is not significant	Pre-enabling phase: No specific pre-enabling work mitigation. Construction Phase: Appropriate measures to reduce direct habitat impact and degradation from the location of the site compound and associated materials outlined in sub-section 4.6.3.2. Appropriate surface water and groundwater quality control measures, pollution control measures, and measures to protect the local drainage ditch set out in sub-sections 4.6.3.3, 4.6.3.6, and 4.6.3.7. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 4.6.3.4 and 4.6.3.8. Operational Phase: No specific operational phase mitigation measures.	Long-term neutral residual impact

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Increased vehicular presence will lead to an increase in nitrogen oxides (NOx) emissions, which can lead to changes in pH of local surface water bodies. Acidification of local surface water network can lead to increased mortality predation rates in downstream fish populations due to reduced ability to respond to damage-released chemical alarm cues. Acidification and high metal concentrations via accidental introduction of hydrocarbons or solvents into local surface water network has the potential to increase mortality of River Lamprey eggs and larvae within the River Liffey downstream of the site. Operational Phase: Mitigation by design, including the implementation of SuDS measures, which will prevent impacts to the local surface water courses, including the downstream River Liffey.			
Terrestrial Invertebrates	High Local	Construction Phase: Degradation of local habitats via surface water, groundwater, and air (dust)-based emissions resulting in deterioration of foraging resources for local	Construction Phase: Temporary to long-term adverse impact of slight significance	Pre-enabling phase: The measures outlined in sub-sections 4.6.2.1, 4.6.2.2, 4.6.2.4 detailing pre-enabling work ecological surveys, woodland sods relocation, and the hoarding off retained sections of woodland.	Long-term positive residual impact of moderate significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		terrestrial invertebrates. Bioaccumulation of pollutants within certain invertebrate groups, namely earthworms, within the soils of polluted habitats has the potential to cause physiological harm as well as introduce toxins to the local food web, with knock-on impacts to predators such as Badger and Woodcock. Physical disturbance to foraging and commuting activities of terrestrial invertebrates within retained habitats on-site during the construction phase. Adverse impacts to local bumblebee species due to short-to long-term habitat loss and fragmentation during construction, which will lead to a loss in available foraging and nesting resources. Loss of grassland habitats will reduce nesting resources for local butterfly species, namely Speckled Wood. Operational Phase: Landscape plans will improve the suitability of the site for terrestrial invertebrates through the creation of foraging, refuge and breeding habitat due to the installation of green roofs, grassland management	Operational Phase: Initial long-term positive impact of moderate significance	Construction Phase: Appropriate measures to reduce direct habitat impact and degradation from the location of the site compound and associated materials outlined in sub-section 4.6.3.2. Appropriate surface water and groundwater quality control measures, pollution control measures, and measures to protect the local drainage ditch set out in sub-sections 4.6.3.3, 4.6.3.6, and 4.6.3.7. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 4.6.3.4 and 4.6.3.8. The measures outlined in sub-section 4.6.3.11 set out to prevent tree root compaction and limb damage. Operational Phase: The guidance outlined in sub-section 4.6.4.1 pertaining to the planting of trees within the site. Appropriate measures to the creation and management of the landscaped meadow and grassland habitats, as well as the created green roofs are set out in sub-	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		changes, hedgerow planting, woodland planting, and the installation of a pond with associated vegetation.		sections 4.6.4.2 and 4.6.4.3. Biodiversity enhancement measures set out in sub-sections 4.6.4.8, and 4.6.4.9, which include the compensatory installation of insect hotels and bee bricks to mitigate the loss of refuge resources due to construction phase habitat removal.	
Invasive Non-native Species	N/A	Construction Phase: Spread of invasive species has the potential to have knock-on effects on local habitats, namely the pNHA woodland habitat, where the spread of invasive species has the potential to impact the structure of local floral community. Operational Phase: It is not anticipated that the proposed development will cause the further spread of invasive species.	N/A	Pre-enabling phase: The measures outlined in sub-sections 4.6.2.1 and 4.6.2.2 detailing pre-enabling work invasive species surveys and detailing the management of invasive species within the relocated woodland area. Construction Phase: The measures outlined in 4.6.3.12 outlining biosecurity measures that will be followed on site to prevent the further spread/introduction of invasive species. The construction phase invasive species monitoring outlined in sub-section 4.6.3.12. Operational Phase: The guidance outlined in sub-section 4.6.4.1 pertaining to the planting of trees within the site. species The operational invasive species monitoring plans set in sub section	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				4.6.4.10.	

4.8 Interactions

Interactions among Biodiversity; Water; Land, Soils and Geology; Climate (Climate Change); Material Assets (Waste); and Materials Assets (Transport)

Construction Stage

There are potential interactions between waste management and water environment which can have a potential impact on key ecological receptors during construction. This includes the removal of invasive species during the construction stage, which involves collected waste biomass (pulled stems/roots and bagged flower heads). If this biomass is not disposed of appropriately at a facility authorized to accept such waste, it has the potential to spread further within the surrounding environment, including within the River Liffey Valley pNHA. Such spreading events can have adverse impacts on high value habitats, such as the adjacent woodland habitat, displacing native species. These potential interactions also include the removal of nutrient-rich topsoil during the construction phase, which if not removed/stored effectively, has the potential to be transported by surface water run-off into the River Liffey, either directly or via the drainage ditch to the north of the site. This has the potential to increase water turbidity which can hinder light penetration and negatively affect macrophytes. Additionally, accidental pollutant spills (hydrocarbons and solvents) can negatively affect local aquatic flora and fauna upon entering the drainage ditch and/or downstream River Liffey. The mitigation measures outlined in Chapters 4 (Biodiversity) and 6 (Water), including the use of silt fences and settlement trains during construction, will ensure effects on habitats, flora, and fauna from water and hydrology will be not significant.

Operational Stage

The operational stage interactions are due to the potential for surface water run-off due to the introduction of additional artificial surfaces within the site. The proposed drainage design includes the adoption of SuDS for surface water collection and attenuation, which will provide environmental benefits, e.g., retention of urban run-off. SuDS are designed to manage stormwater locally to mimic natural drainage and encourage its infiltration, attenuation and passive treatment, which is increasingly important given potential effects of future climate change. The SuDS proposed around the development site include surface water detention/attenuation tanks, permeable paving, green roofs, bioretention areas, and the creation of a pond/wetland area. These SuDS features will collectively provide surface water run-off attenuation, infiltration, and in-situ retention of sediments (and associated nutrients), metals, and hydrocarbons, ensuring no pollution-based degradation of other terrestrial habitats within the locality. The vegetation within the SuDS will provide refuge and foraging opportunities for a range of terrestrial and aquatic invertebrates, which will have knock-on benefits for local bird, bat, amphibian, and mammal populations.

Interactions among Biodiversity; Air (Noise and Vibration); and Material Assets (Transport)

Construction Stage

During the construction stage, the biodiversity assessment has examined how key ecological receptors, such as species and habitats, interact with various environmental factors. Specifically, there is an interaction between traffic and transport and mortality risk for species. Airborne noise from construction activities, including vehicles, can interact with biodiversity as any increase in noise levels has the potential to impact on sensitive ecological receptors. An example of this interaction is the direct and indirect impacts likely to occur on the foraging and commuting activities of local mammals (Badger, Hedgehog, Pine Marten), bats and birds located within the woodland habitat, resulting from the temporary noise and vibration pollution during this stage. Further, noise generated by the construction works has the potential to effect breeding bird species egg production, incubation, brooding, predators, brood parasites, and abandonment, as well as the ability to find or attract a mate and the ability of parents to hear and respond to begging calls of their offspring. While the mitigation measures outlined in the Chapter 4 (Biodiversity) will reduce these impacts by limiting works to the daytime hours and erecting protective hoarding around the retained woodland habitat, disturbance levels during the construction phase will still cause temporary adverse impacts upon local fauna.

Operational Stage

Operational interaction impacts among Biodiversity, Noise and Vibration, and Traffic and Transport are likely to occur given the increased usage of the site, with higher numbers of vehicles and people present within the proposed site. All faunal species will be subjected to increase noise levels (disturbance), as well as ground-dwelling fauna, and some less agile and/or reactionary bird species also seeing their risk of collision injuries and fatalities increase as a result of the hospital's operation and the anticipated increase in vehicles locally.

Interactions among Biodiversity; Water; Air (Dust, Sunlight & Daylight); Climate (Air Quality); and Landscape and Visual

Construction Stage

There is an interaction between water, air quality and biodiversity, as any reduction in the quality of surface water or in air quality can contribute to habitat degradation and have knock-on impacts for faunal and floral species. Air (emissions and dust) pollution generated during the construction stage has the potential to adversely impact watercourses (airborne emissions), photosynthesis and the biological functions (dusts) of valued flora and fauna. Additionally, air (sunlight & daylight) interacts with biodiversity during the construction stage as a result of changes to landscape (woodland clearance) will ultimately change the (sun) lighting regime for flora within the retained habitats on-site. This will have a slight impact on a subset of the more light/shading sensitive flora.

Operational Stage

During the Operational Phase, there will be an interaction between landscape and biodiversity. As outlined in Chapter 11 (Landscape & Visual), the proposed project will include replanting with native species, where possible. Air (sunlight & daylight) will interact with biodiversity during the operational stage as a result of changes to landscape (removal of scrub and trees, along with the planting of new trees and shrub, and the construction of new buildings within the site) will change the (sun) lighting regime for flora within the adjacent habitats. This will have a slight impact on a small proportion of the more light/shading sensitive flora.

Interactions between Biodiversity, Land, Soils and Geology, and Material Assets (Utilities)

Construction Stage

The impact of earth works, land take (habitat loss) and woodland removal for the proposed hospital on local biodiversity will be the most notable impact on biodiversity as a result of the proposed development. Loss of soil value from construction activities and use of unsuitable soil material may affect biodiversity. There is an interaction between soils and geology and biodiversity, as non-native invasive plant species can be spread through soils and can also contribute to habitat degradation. There will be an interaction between utilities and biodiversity, with the provision of construction-based lighting impacting on light-sensitive fauna. The connection of operational lighting fixtures to the electricity network will require excavations, which can spread non-native invasive plant species, contributing to habitat degradation. The mitigation measures outlined in Chapter 4 (Biodiversity), including the retention of excavated topsoil from the meadow habitat, erection of hoarding around retained habitats, suitable construction-based lighting guidance, and construction phase monitoring of invasive species and lighting disturbance on local fauna, which will limit short-term adverse impacts on local fauna. However, a permanent adverse impact of moderate significance is anticipated for the woodland habitat given the removal of a section of this habitat.

Operational Stage

Given the long-term nature of the land take (habitat loss) this negative impact / interaction is carried forward to the operational stage of the hospital. There will also be a long-term negative impact / interaction between biodiversity and utilities, with the provision of operational lighting adversely impacting local light-sensitive fauna. While the topsoil layer and saplings from the woodland area due for removal will be translocated during the construction phase, as detailed in Chapter 4 (Biodiversity), the success rate of woodland translocation is mixed, and takes an extended period to determine (in excess of 10 years) its success. As such, a moderate adverse permanent impact on the woodland habitat will be carried forward into the operational phase.

Interactions between Biodiversity and Cultural Heritage (Archaeological & Architectural)

Construction Stage

There will be an interaction between Biodiversity and Cultural Heritage (Archaeological & Architectural) during the construction phase, as the proposed refurbishment/demolition of the existing historical structures on site, including the stonewalls, will lead to a loss in refugia for local fauna and the removal of the existing flora. The presence of an on-site ECoW as well as the completion of pre-enabling/construction phase checks of the historical structures on site, as described in Chapter 4 (Biodiversity), will limit the risk of direct disturbance/injury to local fauna utilising these structures. Additionally, in the event archaeological remains are identified during the stripping of topsoil during the construction phase, additional impacts on biodiversity may occur. If this scenario arises, the significance of effect on biodiversity would be determined by the nature and extent of works required.

Operational Stage

In the event that the discovery of archaeological remains results in further investigation into habitats that are set to be retained, this will lead to additional ecological lag, limiting ecological functionality within the sites, as a result of the required reinstatement of habitats following archaeological investigations.

4.9 Potential Cumulative Effects

Of the local permitted (and pending) plans and projects, and those for which an application has been made but not yet determined, 4 projects are presented as the most likely to act in a cumulative manner given the presence of overlapping Zols with the site. These 4 development projects are listed below:

- SD24A/0051;
- SD24A/0241W;
- SD22A/0372; and
- SD24B/542W.

Each of these projects overlaps with one or more of the Zol buffers, i.e. surface water, disturbance and dust, associated with the proposed development. Therefore, there is a potential for cumulative and/or in-combination impacts to arise with the construction and operation of the development site. Potential impacts that may arise as a result of relationships between sensitive receptors within and outside the site have been addressed in this EIAR and AA Screening. Guidance for the assessment of indirect and cumulative impacts, as well as impact interactions has been taken from the European Commission document 'Guidelines for the Assessment of Indirect and Cumulative Impacts' as well as 'Impact Interactions' (Walker and Johnston 1999) and 'Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland' (CIEEM 2016 and 2006).

The list of projects above has been consulted. With the implementation of mitigation measures outlined in this chapter, no significant cumulative impacts are considered likely with regard to SPAs and SACs within the Zol however, there is potential for cumulative impacts on the Liffey Valley pNHA.

4.10 Difficulties encountered in compiling this Information

Due to protracted statutory consultation on the project in relation to traffic and transport between 2024 and 2025, the bat surveys as reported in Appendix 4 (Ref Bat Survey Report, Gannon +Associates, March 2026) were not carried out during the 2024 survey seasons.

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5 Land and Soil

5.1 Introduction

The scope of the development will involve limited land take and shallow excavation as part of the construction phase. The impacts of construction activities and operational functioning of the development on geology, land, soils and hydrogeology have been assessed within this chapter.

A number of walkover surveys, and the installation of trial pits and boreholes as part of site investigations will furnish relevant information on geology at the site.

5.2 Assessment Methodology

The assessment of potential impacts on land and soil will be undertaken in accordance with EPA EIA Guidelines (2022) and recommendations in "Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements" by the Institute of Geologists of Ireland (2013). The Directive requires EIA practitioners to consider the sustainable use of soil and land.

A Conceptual Site Model for the site will be developed based on the site investigations undertaken, the information on groundwater levels in the boreholes and the proposed flood management scheme. The impacts of the scheme on geology, groundwater, hydrogeology and water dependant habitats and species will be assessed, and any significant impacts will be mitigated.

A site walkover visit was conducted on 02/06/23 to investigate any likely constraints that the site may present to the project.

Several sources of information were used to establish baseline environment conditions through a desktop survey.

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022).
- Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements" by the Institute of Geologists of Ireland (2013).
- EPA Maps - gis.epa.ie
- Web map viewer
- ESRI shapefiles under Creative Commons Attribution license 4.0
- GSI maps - gsi.ie
- Web map viewer
- Esri shapefiles under Creative Commons Attribution license 4.0
- Teagasc soil and subsoil database and mapping keys
- Aerial photography
- Google Earth
- Google Maps
- Site investigation report
- Site walkover

5.2.1 Governing Legislation

The EU has set out requirements for Environmental Impact Assessments under the EIA Directive 2011/92/EU (as amended by Directive 2014/52/EU). The principal piece of legislation under which an EIA may be undertaken for developments in Ireland is The Planning and Development Act, 2000, as amended. Further regulations are explained in the Planning and Development Regulations, as amended and European Communities (Environmental Impact Assessment) Regulations 1989, as amended.

The legislation relevant to this chapter is listed below. This legislation was consulted during the preparation of this assessment, and the limits contained within them will be used for the purposes of monitoring during construction of the proposed development.

- Water Framework Directive (2000/60/EC);

- Groundwater Directive (2006/118/EC);
- European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010);
- European Union Environmental Objectives (Groundwater) (Amendment) Regulations, 2016 (S.I. No. 366 of 2016);
- Waste Management Act 1996, as amended;
- Habitats Directive (92/43/EEC)

5.3 Receiving Environment

Table 5-1 shows the summary of the land, geological and hydrogeological features identified, and their importance ranking. These are further discussed in the following sections.

Table 5-1 Site importance rankings

Feature		Ranking	Comment
Land/land take	Surrounding land use includes arable fields, woodland, residential properties and industrial and commercial properties. On site includes derelict farmyard and partly demolished walled garden (south) and current facilities and woodland (north).	Medium	The land on-site has potential value for agricultural use and is zoned high amenity.
Soil and subsoil	Made ground	Low	Contamination from man-made materials will be determine from site investigation and chemical analysis.
	Topsoil	High	Mineral clay/loamy soils potentially productive
	Till	Low	Broadly low-value with the exception of the Lucan Esker till
Geological Heritage sites	Lucan Cutting (SD008)	High	Site is of county importance
	Lucan Esker (SD009)	High	Site is of county importance
Groundwater	Dublin groundwater body (IE_EA_G_008)	Medium	This is a large groundwater body with highly varied characteristics regarding recharge, transmissivity and discharge. Sensitivities and vulnerabilities are highly localised.
Groundwater Abstractions	Sunday Well (IE_GSI_GW_Well_35454) approximately 725m to the southwest Warm Spring 1013W (IE_GSI_GW_Well_7870) approximately 570m to the east	Low	Sunday Well is marked on the OSi 6 inch historic maps (marked as "site of" on the last edition) and is also recorded by the National Monuments Service, who note that no surface remains of the well are now visible. The Warm Spring is recorded by GSI. The spring is supported by a moderately productive aquifer only in local zones.

The site is located east of Lucan and south of the Liffey River. The site is accessible from the Lucan Road (R835). The N4 runs further south of the development. St. Andrews national school is adjacent to the site to the east. Laraghton estate is located west of the site and Liffey River. St. Marys NBS is located along Chapel Hill (L1005) to the west. Lucan Pieta House and Lucan Heights

estate are located to the south of the site. Edmundsbury estate is comprised of non-irrigated arable land bordered by broadleaf woodland.

5.3.1 Bedrock Geology

Bedrock geology composition was assessed through a desktop survey using the 1:100,000 GSI bedrock geology map.

The surrounding area within a 2km boundary from the site has mixed bedrock. Calp limestone dominates to the north, south and west. Calp limestone and Tober Colleen Formation meet directly under the site splitting it north to south, see Figure 5-1. Calp has a dark grey to black limestone and shale composition. The Tober Colleen Formation is comprised of calcareous shale and limestone conglomerate.

East of the development and south of the Liffey lies a small oval spanning approximately 0.64 km² of Waulsortian Limestones comprised of massive, unbedded lime-mudstone. Within this area lies a smaller oval of approximately 0.067 km² of Ballysteen Formation comprised of dark, muddy limestones. Lying just within the 2km boundary northwest of the development is the Lucan Formation comprised of dark limestone and shale calp. The physiography of the site is described as flat to undulating glacial sediments.

5.3.2 Soils, Subsoils and Quaternary Sediment

Topsoils are defined as base rich mineral soils characterised as clay or loam drift with varying depth and drainage. The Elton (1000x) soil association covers the entire site. Soils of this association fall within the following subgroups; Typical Luvisols, Stagnic Luvisols, Humic Surface Water Gleys and Typical Surface Water Gleys. Luvisols are associated with clay eluviation and a distinctive topsoil while Surface Water Gleys are associated with a high-water table and slowly permeable sub-surface horizon. Framing the River Liffey are alluvial soils which may be distinguished by a high-water table and poor drainage. Brown Alluvial Soils are well drained alluvial deposits. Soils with a high water table and poor drainage are generally considered infertile

Quaternary sediments of the surrounding areas are derived from Carboniferous limestone, shale, and mudstone bedrock, comprising mostly of limestone and glacial till, glacial sands and gravels and calcareous bedrock close to the surface, see Figure 5-3. Hummocky sand and gravel glacial depositions underlie the access road to the east.

Subsoil permeability directly below the site boundary is not mapped, see Figure 5-4. Bedrock is at or near the surface spanning the northern section of the site. Soils of the southern section are described as deep and well drained and quaternary sediments are predominantly limestone and glacial till so it is likely that subsoil permeability is moderate to high.

5.3.3 Karst

There are no karst features within 2 km of the site. St. Columbs well, a spring, lies to the northwest within 5 km.

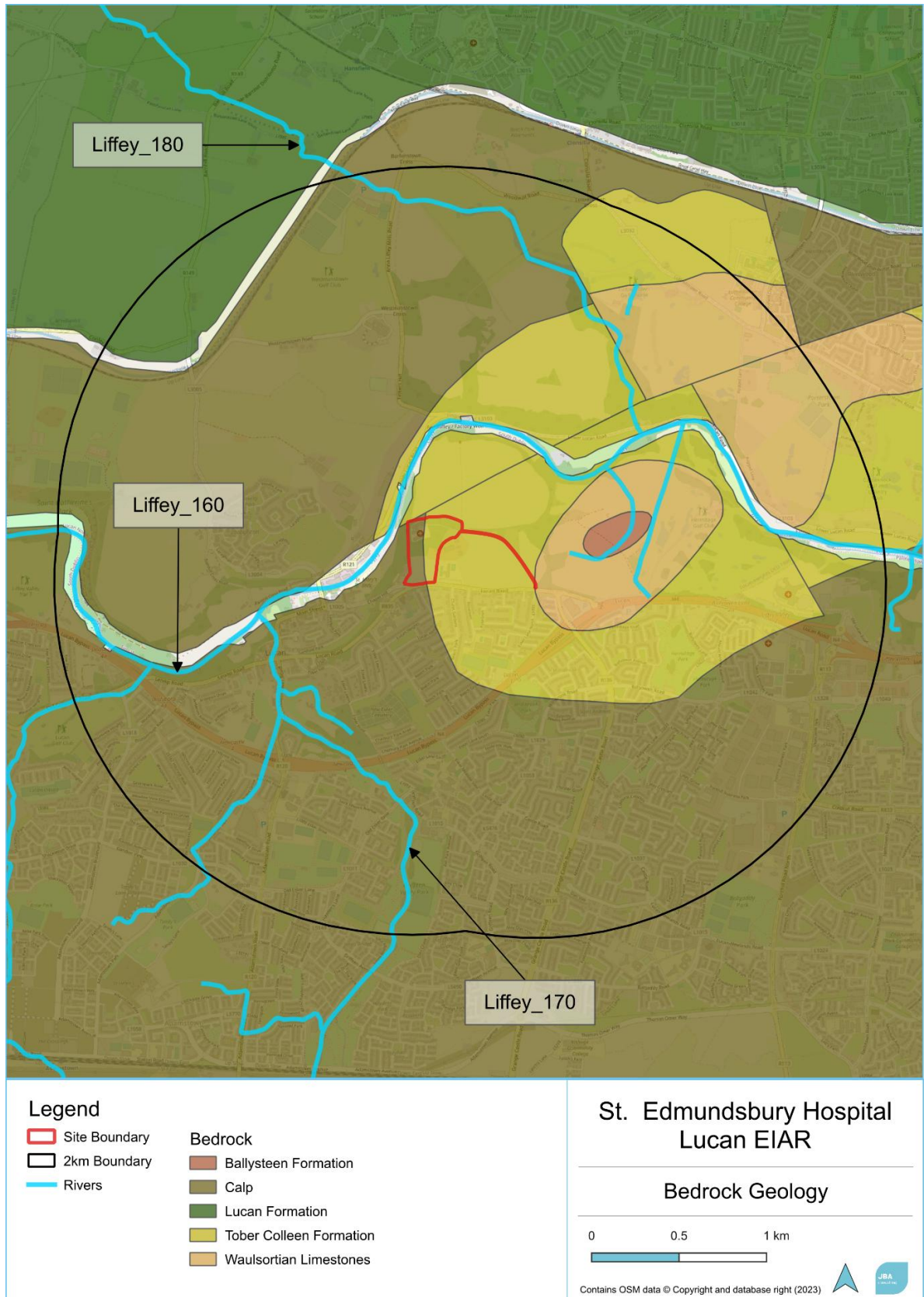


Figure 5-1 Bedrock Geology (GSI, 2023)

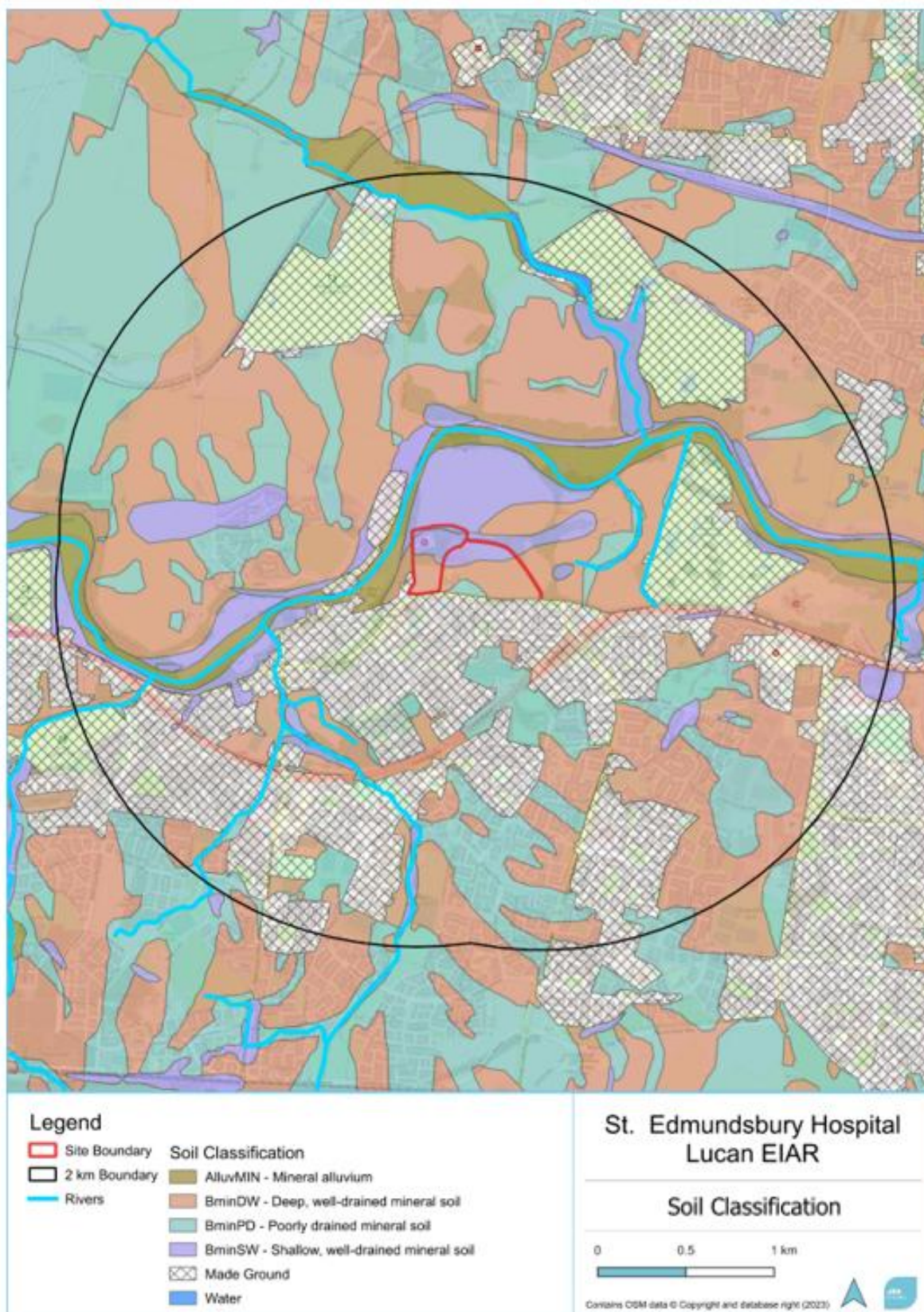


Figure 5-2: Soil Classification (GSI 2023 Teagasc, 2023)

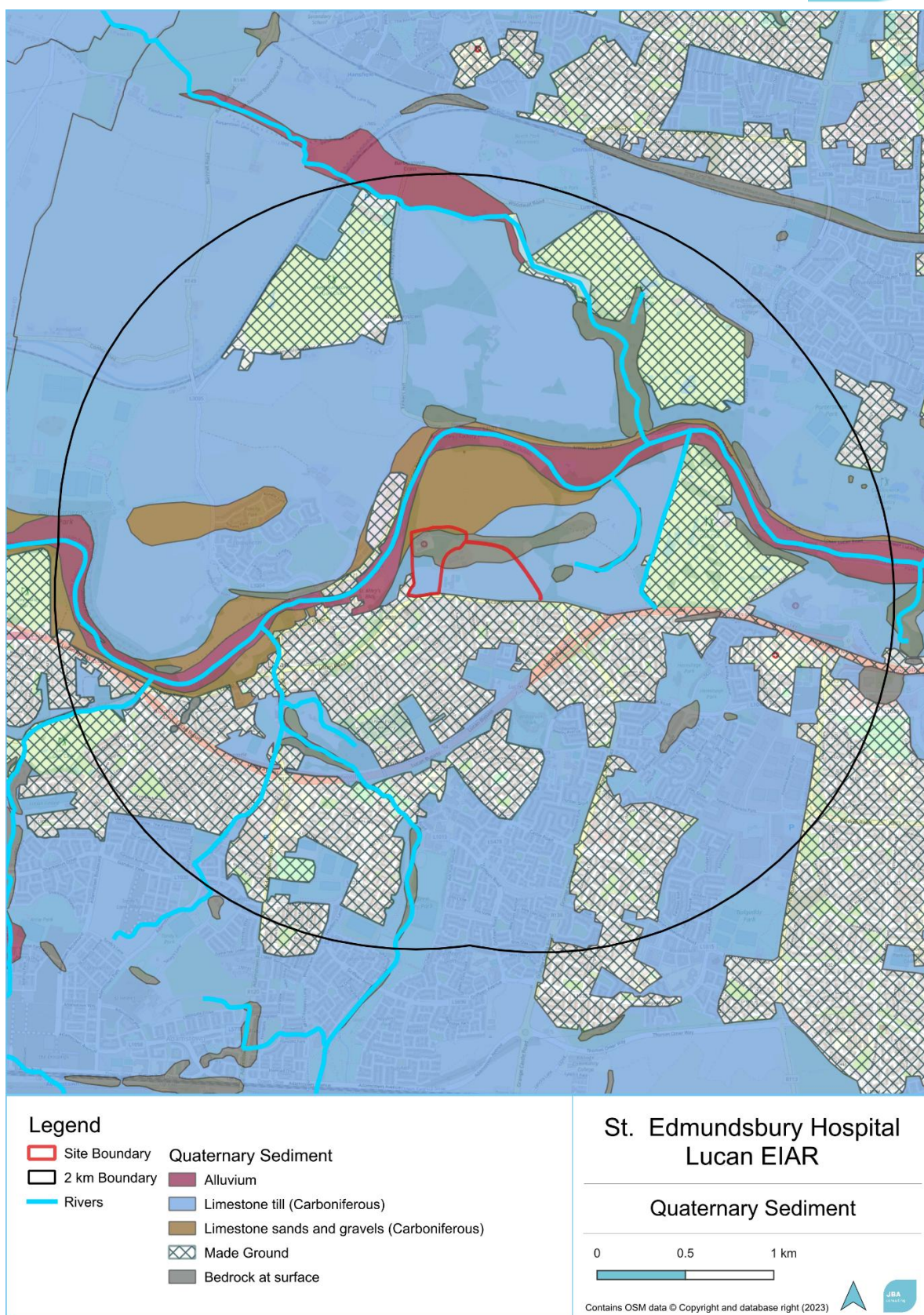


Figure 5-3: Quaternary Sediments (GSI, 2023)

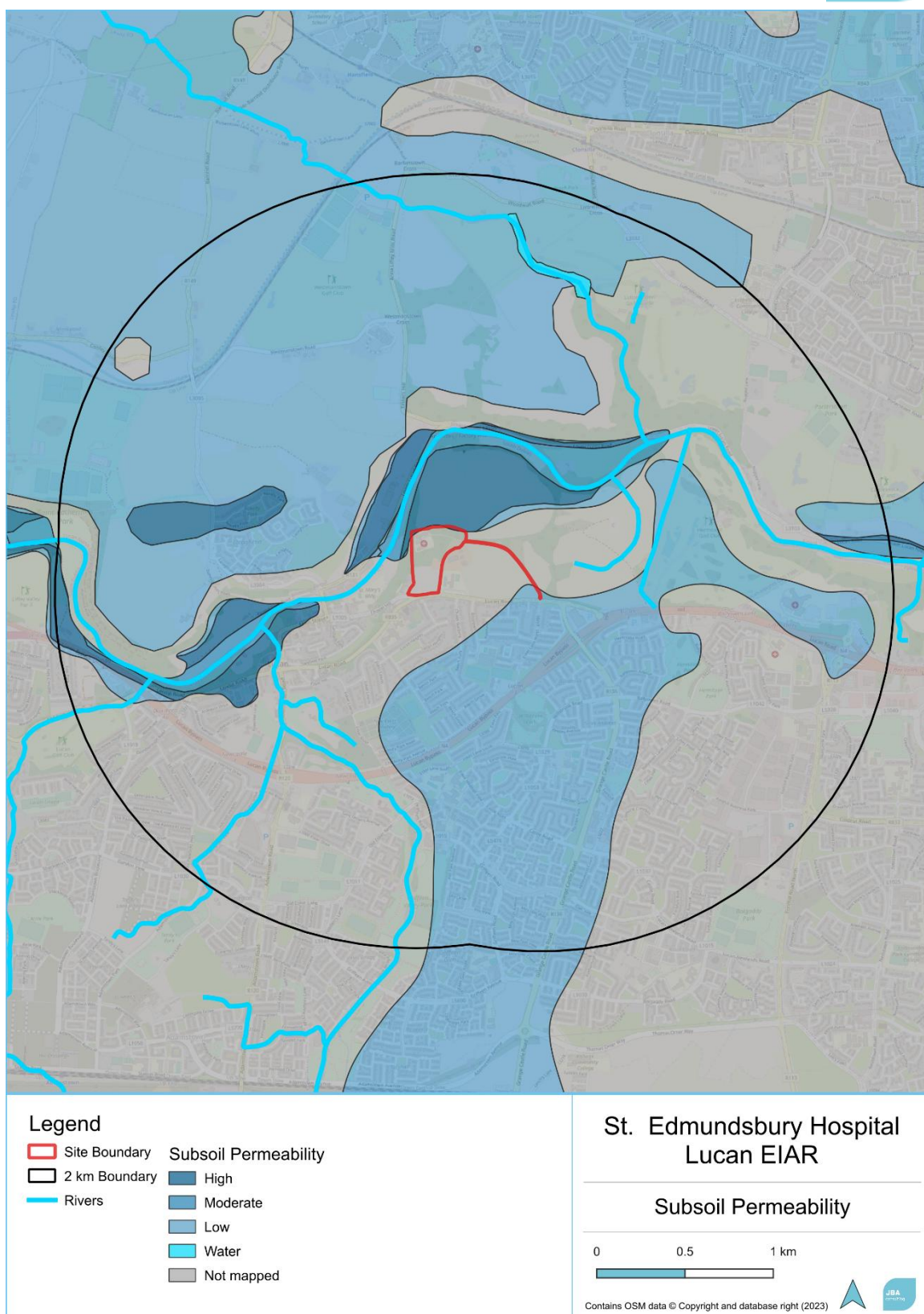


Figure 5-4: Subsoil Permeability

5.3.4 Geohazards

A fault line runs from southwest to northeast splitting the 2 km boundary approximately in half, see Figure 5-7. The site boundary intersects the fault at the northwest corner of the existing St. Edmundsbury building. No earthquakes within 15 km have been recorded between 1980 - 2023. No landslides have occurred within 2 km of the site. Radon risk is moderate under the site and small pockets of high-risk areas are located in all directions from the site boundary.

5.3.5 Geological Heritage

Southwest of the site is the N4 Lucan cutting (SD009). This geological heritage site is a roadside exposure of calp limestones retained along the N4 underpass junction for Lucan. The site is designated as minor importance, but its evident visibility provides some interest to the high volumes of people using the underpass.



The north west section from the bridge.

The south east section from the bridge.

Figure 5-5: Photographs showing Lucan Cutting Geological Heritage Site (SD009) (GSI, 2023)

Ref https://gsi.geodata.gov.ie/downloads/Geoheritage/Reports/SD009_N4_Lucan_Cutting.pdf)

To the south of the development is the Lucan Esker (SD008). It is a marked example of meltwater deposition recording glacial orientation and movement northwest to southeast. Historical quarrying of the sands and gravels has fragmented the esker. Intact portions can be sighted adjacent to Esker Glebe in Griffeen Valley Park and at the Vesey Estate close to the Griffeen River. Many local roads, townlands, cultural features and modern estates are named after the esker.

A crag-and-tail feature is located to the northeast of the site partially within the 2km boundary; however, this is not currently recognised as a site of geological heritage.

5.3.6 Quarries/Mines

The Extractive Industry Register (www.epa.ie) and the GSI mineral database (www.gsi.ie) were consulted to identify any historic/existing mineral sites within the study area. No active mines or quarries were identified within the study area.

An iron deposit is located west of the site where the historic Lucan Iron Works can be noted on the old 6-inch map of Ireland. Industrial and commercial units now comprise the area formerly occupied by the Iron Works. The proposed development is unlikely to have any significant effects on land and soils in this area.

5.3.7 Designated Ecological Sites

The South Dublin Bay, North Dublin Bay and Rye Water Valley/Carton Natura sites are within the same groundwater body as the site.

5.3.8 Groundwater

The Dublin groundwater body (IE_EA_G_008) underlies the site which was reported to have a good WFD status for the period 2019 - 2024. It is currently under review for risk of failing to meet WFD objectives for 2027.

Groundwater flows in a general eastward direction to the coast and Liffey River. Geological permeability decreases acutely with depth and groundwater flow for the Dublin groundwater body is suspected to take place close to the surface with isolated flow along fractures and fissures at depths of up to 50 mbgl. Groundwater vulnerability varies across the site within the 2 km boundary. Directly below the majority of the site, vulnerability is extreme and rock is at or near the surface in the northern section. North of the development surrounding the Liffey River, groundwater vulnerability is high which is influenced by the corresponding high subsoil permeability.

No Zone of Contribution or groundwater source protection areas are within the study area.

5.3.9 Aquifers

A locally important aquifer with moderately productive bedrock is associated with the Calp bedrock underlying the western half of the site and dominating the geology to the west. A poor aquifer with generally unproductive bedrock except for in local zones is associated with the Tober Colleen Formation underlying the eastern half of the site. The site is therefore split into eastern and western section with regards to aquifer productivity.

Recharge is low averaging 51 - 100 mm annually with small patches falling within 101 - 150 mm range.

5.3.10 Groundwater Extractions

Two well locations are within 2 km of the site. St. Edmundsbury Spring approximately 570m northeast of the site and adjacent to the Liffey River is a warm spring where temperatures range from 12.5 - 25°C. This is significantly above typical temperature values for Irish groundwater, and it is proposed that groundwater issuing from this spring may be much deeper than the Dublin groundwater body. Warm springs are associated with deep faults and this spring is located within 100 m of the fault running northeast, see Figure 5-7.

The Sunday Well site is located approximately 725m to the west of the development adjacent to the River Liffey. This well is associated with the locally important aquifer with moderately productive bedrock (Calp) which has an expected yield range of 100 - 400 m³/day. The aquifer associated with the Dublin groundwater body and the Tober Colleen Formation to the east is categorised as a poor aquifer with expected yields of less than 100 m³/day. The Sunday Well is recorded by the National Monuments Service as a holy well site, however no surface remains now exist.

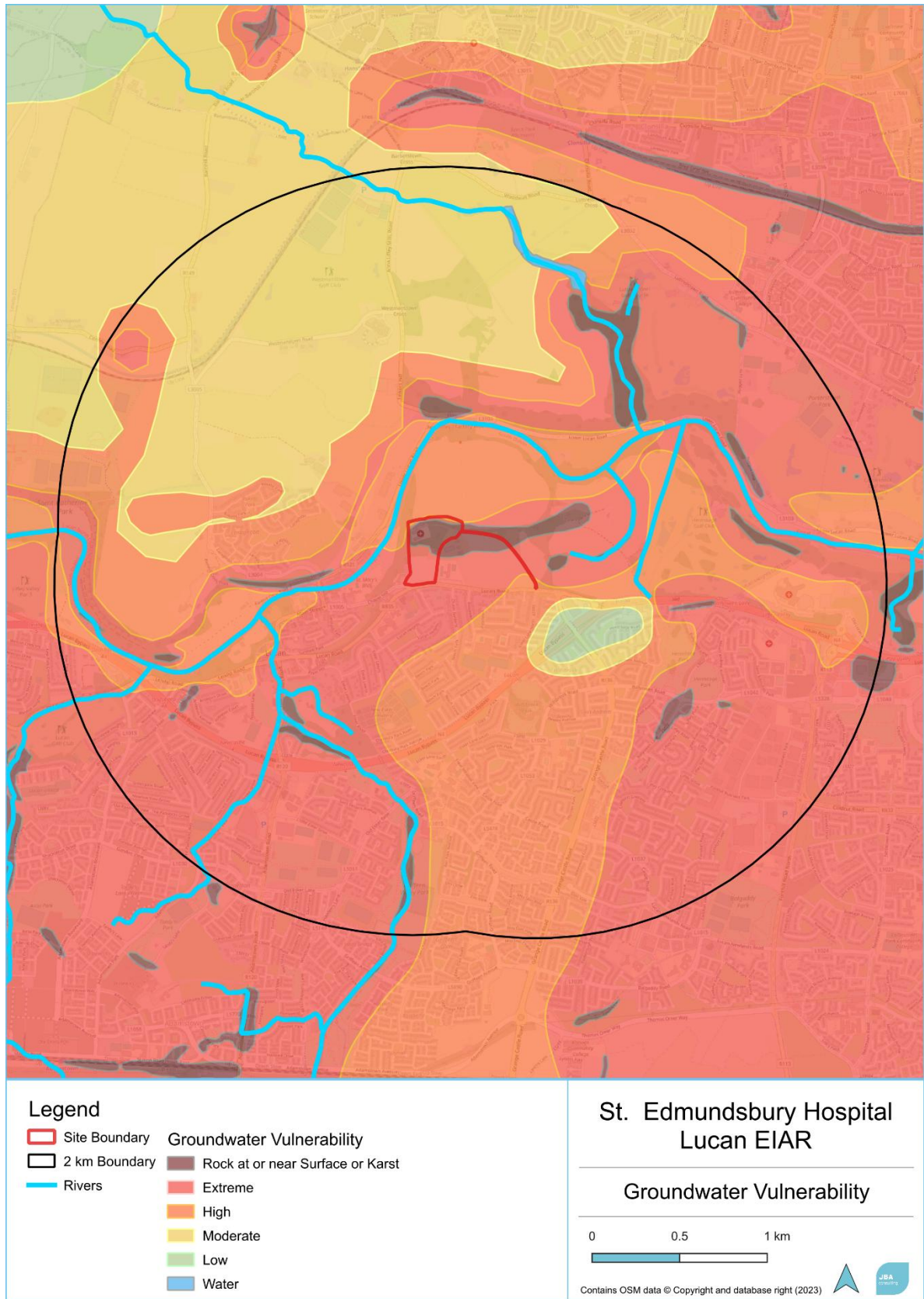


Figure 5-6: Groundwater vulnerability

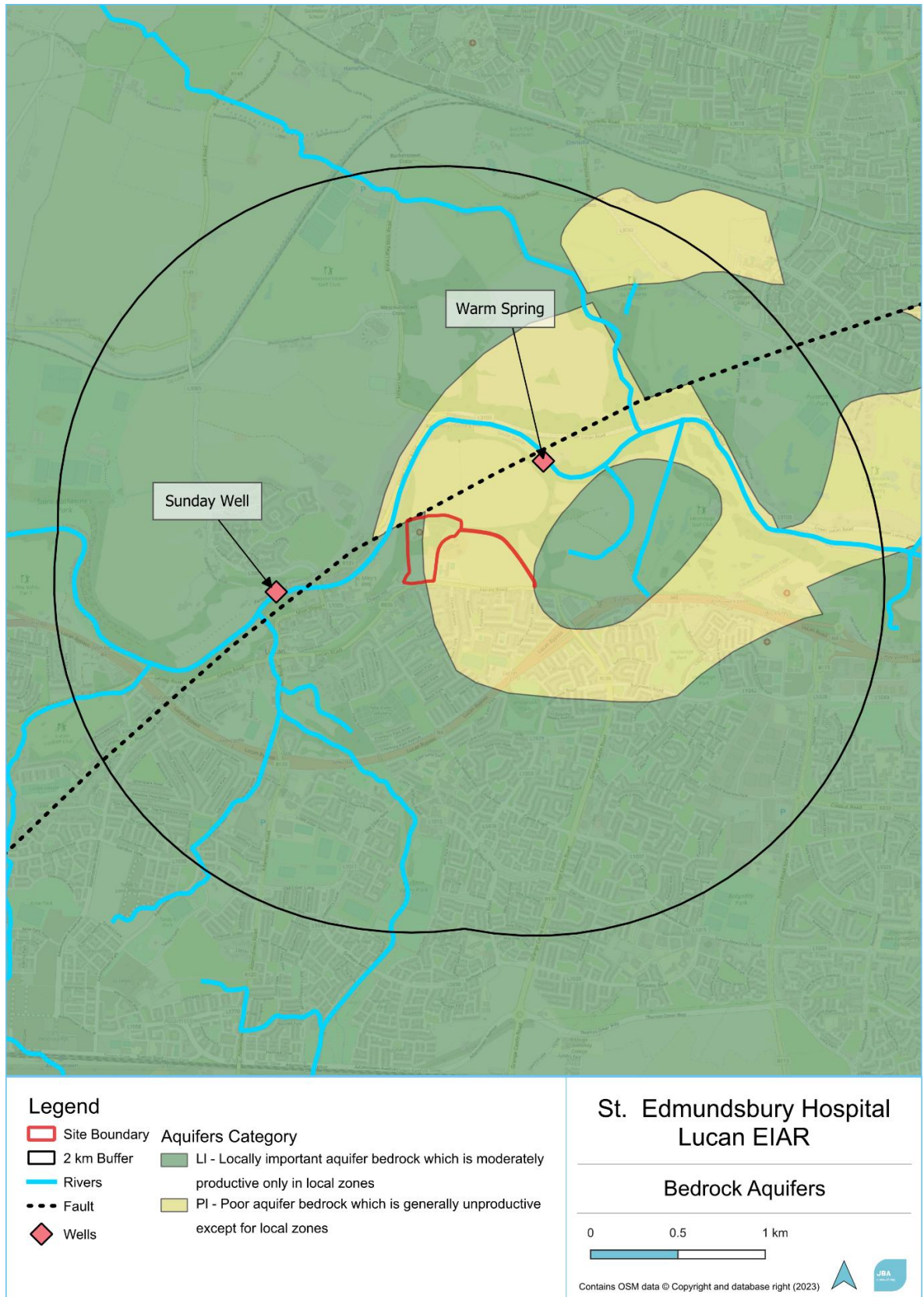


Figure 5-7: Aquifer classification and relevant springs, showing fault line

5.3.11 Site investigation

A full site investigation will be undertaken to determine groundwater levels, soil profile and thickness and whether any contaminants are present.

The results will inform mitigation measures and waste management procedures which are to be outlined in the construction environmental management plan.

5.3.12 Contaminated ground

The site investigation will confirm the presence of any ground contamination. Given the historical land use as a farmyard, the presence of hazardous substances is likely to be low.

5.3.13 Groundwater Monitoring

The site investigation including borehole measurements and groundwater testing will confirm the groundwater levels across the site. Dinantian Upper Impure Limestones comprise the groundwater rock unit underlying the site which has an estimated transmissivity rate between 5-20 m²/day.

5.3.14 Conceptual Site Model

A desktop conceptual site model (CSM) has been prepared using online data and resources. The purpose of the CSM is to establish any linkages between a source(s) of a potential contaminant, a pathway where the contaminant may become mobilised (for example through the air, surface, or groundwater) and a receptor(s) that may intercept the pathway of the contaminant (for example habitats, species, or humans).

SPMHS acquired the estate house in 1898 and refurbished and used the house for its services. In the 1980s the extension adjacent to the historic estate house was built. Corine data shows no land use changes within the site or surrounding estate grounds since 1990.

Within the 2 km boundary, land use changes typical of urban sprawl and a developing suburban landscape are prevalent between 1990 - 2006. Changes become less widespread and frequent between 2006 - 2018. Much of the surrounding area was historically pastures or arable land which has been converted into discontinuous urban fabric, commercial or industrial or construction sites. The natural environment of the riparian woodland of the estate grounds has remained unchanged and offers an important recreational and visual amenity to residents in contrast with the rapid urbanisation of the area.

Review of the historic land use suggests that the risk of ground contamination is unlikely to be high.

5.3.15 Source

The main source of contamination on site will be works undertaken during the construction phase. Construction materials, hydrocarbons and sediment are potential pollutants.

The presence of any existing soil contamination within the site will be determined through a site investigation.

5.3.16 Pathway

The main pathway for pollutants is likely to be directly to groundwater through limestone till derived subsoils. Exact groundwater levels will be investigated and will determine the significance of this pathway.

Surface run-off to the Liffey River is also a possible pathway, although the dense riparian vegetation will remain unaltered and will provide a barrier to this pathway.

5.3.17 Receptor

The main identified receptors are the underlying groundwater body, overburden, and bedrock. Secondary receptors identified are the riparian woodland of both riverbanks and part of the arable agricultural fields surrounding the site to the west, north and east which are protected under a Special Amenity Area Order (SAAO). The riparian woodland is also a proposed Natural Heritage Area (pNHA).

Natura 2000 sites including the South Dublin Bay (SAC) are downstream of the river which may be receptors for groundwater or surface water contamination.

5.4 Potential Effects

5.4.1 Construction Phase

Construction activities, particularly those involving excavation of overburden, pose a significant risk to land, soils, and hydrogeological features such as groundwater bodies and aquifers. The sections below outline the potential effects that may arise from construction activities without any mitigation measures implemented. Details of excavation depth and methods will be provided by the contractor.

Recommended mitigation measures are outlined in Section 5.5.

5.4.1.1 Topsoil

The total volume of material to be excavated during the construction phase will be confirmed by the appointed contractor. Unused material will be removed from the site using licenced hauliers to a licenced recovery/disposal facility. Inert topsoil will be reused on site where possible.

During construction excavated topsoil held on site poses a potential risk from erosion which may enter surface and ground waterbodies causing sediment pollution. Covering of topsoil stockpiles with rapid vegetation or other means is proposed as part of the construction methodology. No other mitigation measures are proposed. The effects of the proposed development on soil will be **Temporary, Slight, Adverse**.

5.4.1.2 Quaternary Deposits

Quaternary sediment on the site is identified as limestone till and calcareous limestone and shale bedrock dating back to the Carboniferous period. The site is not a geological heritage site; however, the removal of till will result in a permanent negative effect of slight/moderate significance. During construction the removal of till will also increase the vulnerability of groundwater to contamination. This will be a **Temporary, Slight, Adverse** effect.

5.4.1.3 Dewatering

During construction, any groundwater encountered will be pumped out, treated, and discharged to the surface water network under licence with SDCC in order to keep the working area dry. Exact flow rates will be determined from borehole measurements. Soils are described as well drained in Teagasc and GSI data which suggests permeability may be high with a low water table. The aquifers below the site are relatively unproductive, with low recharge and no commercial abstractions taking place within 2km of the site. The effects on groundwater will therefore be **Temporary, Slight, Adverse**.

5.4.1.4 Pollution

During construction, leaks and spills have the potential to cause acute, localised pollution to soils and groundwater. Due to the characteristics of the site and volumes of potential pollutants likely to be on site at any time, the effects from this will be **Temporary, Slight, Adverse**.

5.4.1.5 Geological Heritage

The N4 Lucan cutting and Lucan Esker are located outside of the site boundary and due to the distance from the site, the proposed development will have a **Neutral** effect.

5.4.2 Operational Phase

During the operational phase the effects on groundwater are likely to be minimal. Groundwater recharge from the current environment is low and the development will reduce its impact on groundwater recharge by incorporating SuDS into the development design. The effect will be **Permanent, Imperceptible, Neutral**.

Soils, quaternary sediment, and bedrock will be left undisturbed following the construction phase as excavation activities will cease. The impact on these once operational will be **Permanent, Imperceptible, Neutral**.

5.4.2.1 Land take

Land take from the areas of disused farmyard within the historic walled garden, and small areas of the estate to the north of the central woodland will be required as part of the proposed development. This will involve land take of open space, although, public access is prohibited and currently the derelict site attracts anti-social behaviour. Land take north of the woodland will be minimal and much of the open space surrounding the existing buildings will remain. The land to be built on is not currently in use for agriculture or other productive uses.

Soft landscaping outlined in the landscape plan will reduce the effect of the loss of open space through planting. The overall effects from land take are expected to be **Permanent, Slight, Adverse**.

5.4.3 'Do Nothing' Scenario

If the proposed development is not constructed there would be no effects of this on land and the hydrogeological regime would remain the same. Climate change will likely increase the frequency and severity of rainfall therefore increasing recharge and discharge through groundwater bodies.

Natural succession of plants would likely occur over a long period of time and provide carbon and water sinks. This would be a positive effect.

There would be no land take from the site and public access would remain forbidden. The derelict farmyard and walled garden have attracted anti-social behaviour which may continue if the proposed development is not constructed. This would be a **Permanent, Slight, Adverse** effect.

5.5 Mitigation Measures

5.5.1 Construction Phase

A site-specific Construction and Environment Management Plan (CEMP) will be developed by the appointed contractor. This will outline the measures to be implemented during construction to mitigate potential effects on the geology and hydrogeology of the site.

There is potential for impacts to the soil and geology underlying the site during construction. However, deep excavations are not required so any impact is not expected to be significant.

Surface water discharge from the site will be monitored on a weekly basis. At a minimum the monitoring will test the following characteristics:

- pH;
- Suspended Solids;
- COD;
- Total organic carbon;
- Conductivity

Dust monitoring will be carried out as discussed in Chapter 7 - Air and Climate. Visual inspection of the site to ensure best practices and mitigation measures outlined above are being implemented and followed will take place at regular intervals.

5.5.2 Operational Phase

Groundwater levels should be monitored for a minimum of 1 year following the completion of construction of the proposed development. This will determine if the development has any effect on hydrogeology. If effects are identified, further surveying will be carried out by the applicant and remedial measures will be devised depending on the nature and extent of the effect.

5.6 Residual Impacts

5.6.1 Construction Phase

Following implementation of the proposed mitigation measures, the residual effects of the proposed development on land, soils, and hydrogeology will be minimised.

Following the implementation of the mitigation measures, the effects during the construction phase will be **Short-term, Imperceptible, Neutral**.

5.6.2 Operational Phase

The design of the scheme has been such that there are no predicted effects on land and soils during the operational phase of the development.

Overall, the long-term effects of the proposed development will be **Permanent, Imperceptible, Neutral**.

5.7 Interactions

Surface Water

Effects of the proposed development on surface water are linked with effects on groundwater and hydrogeology. Run-off from the site may be intercepted by vegetation that protects surface water. However, the run-off may affect the soil supporting the riparian woodland. Chemicals or suspended solids may affect soil fertility and quality therefore having a negative effect on surrounding vegetation that is protected under the SAAO. Reduced soil quality adjacent to surface water bodies may increase the likelihood of surface water contamination. Without mitigation, this interaction could result in a short-term, significant, adverse effect. Mitigation measures outlined in this chapter and EIAR Chapter 6 will reduce the likelihood of such interaction decreasing the effect to temporary, slight, adverse.

Biodiversity

Interactions between soils, geology, and biodiversity can occur through surface, groundwater, and air pathways, which poses a risk of contamination via surface water run-off, dewatered groundwater, and soil erosion. Introduction of contaminants and suspended solids could lead to habitat degradation of the adjacent habitats or downstream groundwater or surface water receptors.

With the implementation of mitigation measures outlined in this chapter, potential impacts through interaction would be short-term, imperceptible, not significant.

5.8 Cumulative Effects

The list of projects which have been granted planning permission within a 2km radius of the proposed development, has been consulted; no significant adverse impacts on Water are expected.

6 Water

6.1 Introduction

This chapter of the EIAR comprises an assessment of the likely significant impacts of the proposed healthcare development within the grounds of the existing St Edmundsbury Hospital in Lucan, South Dublin with respect to water and hydrology.

The proposed site has a total area of c. 8.10 ha. The site consists of the St Edmundsbury Hospital grounds and buildings, and is encircled by greenfield to the north, farm buildings and a school to the east, Lucan Road to the south, and the River Liffey with its riparian corridor and a preschool to the west.

This chapter of the EIAR was prepared by David Casey BSc MSc MCIWEM and Conor O'Neill BA (Mod) MSc Adv Dip. David Casey is Principal Engineer with JBA Consulting with over 10 years' experience as an environmental consultant and has worked on numerous Water chapters for EIARs, along with experience preparing Soils and Geology chapters and Flood Risk Assessments. Conor O'Neill is an Environmental Scientist with JBA Consulting with 5 years' experience as an environmental consultant and has prepared numerous Water chapters for EIARs.

6.2 Assessment Methodology

6.2.1 Legislation, Policy, and Guidance

The methodology used in this assessment follows current Irish guidance as outlined in:

- OPW / DoECLG planning guidance, "The Planning System and Flood Risk Management (2011).
- Environmental Protection Agency (EPA) (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- Department of Housing, Planning and Local Government (DHPLG) (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.
- National Roads Authority (NRA), 2008. Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.
- Institute of Geologists of Ireland (2013) Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements.
- Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU) as amended by 2014/52/EU). European Union 2017.

In assessing likely potential and predicted effects, account is taken of both the importance of the attributes and the predicted scale and duration of the likely effects.

6.2.2 Site Visit

As part of site investigations, a number of walkover surveys have been carried out.

This assessment was considered in the context of the available baseline information, potential effects, and other available relevant information. In collating this information, the following sources of information and references were consulted:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022)
- EPAMaps.ie
- OSI.ie – 6" & 25" maps
- Aerial Mapping
- South Dublin County Development Plan 2022-2028
- Foul and Storm Layouts and SuDS Devices Layout of St. Edmundsbury Hospital -J. B. Barry and Partners Limited Consulting Engineers.

6.2.3 Governing Legislation

The EU has set out requirements for Environmental Impact Assessments under the EIA Directive 2011/92/EU (as amended by Directive 2014/52/EU). The principal piece of legislation under which an EIAR may be undertaken for developments in Ireland is the Planning and Development Act 2000, as amended. The Act is supplemented by the Planning and Development Regulations 2001, which have been amended including by the Planning and Development Regulations and European Communities (Environmental Impact Assessment) Regulations 2018.

The legislation relevant to surface water is listed below. This legislation was consulted during the preparation of this assessment, and the limits contained within them will be used for the purposes of monitoring during construction of the proposed development.

- Water Framework Directive (2000/60/EC);
- European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (S.I. No. 272 of 2009);
- European Communities Environmental Objectives (Surface Waters) (Amendment) Regulations 2019 (S.I. No. 77 of 2019);
- European Communities (Quality of Salmonid Waters) Regulations (S.I. No. 293 of 1988);
- Habitats Directive (92/43/EEC);
- European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9 of 2010);
- European Union Environmental Objectives (Groundwater) (Amendment) Regulations 2016 (S.I. No. 366 of 2016);
- Local Government (Water Pollution) Act 1977; and
- Local Government (Water Pollution) (Amendment) Act 1990.

6.3 Receiving Environment

6.3.1 Hydrological Environment (Surface Water)

The site is situated within the Liffey and Dublin Bay WFD catchment (09). The catchment is 1616km² in area (EPA, 2021), with the main sub-catchments being the Liffey, the Dodder, and the Tolka Rivers. The sub-catchment of interest is the Liffey_SC_090.

The sub-catchments are additionally subdivided into river sub-basins, which are the Water Framework Directive (WFD) management and reporting divisions. The location of the proposed development is within the LIFFEY_180 sub-basin. Pressures acting on the LIFFEY_180 include urban runoff and urban wastewater (EPA, 2021).

6.3.2 Watercourses

There is one river close to the proposed development; the River Liffey, which lies to the west and north of the site, flowing generally in an easterly direction. The River Liffey, where it passes close to the proposed development, is categorised as "Poor" Status and is "At Risk".

Numerous fish species are present in the Liffey such as Brown Trout, European Eel, Gudgeon, Lamprey, Minnow, Roach Salmon, and Stone Loach. The Liffey is listed as a salmonid waterbody in the European Communities (Quality of Salmonid Waters) Regulations (S.I. No. 293 of 1988). Sites where salmonid species were noted are located approximately 420m downstream from the project development site (Inland Fisheries Ireland, 2023). On the River Liffey close to the proposed development site is a dam, which causes an obstruction to salmon migration. Other built elements such as wastewater tanks, clarifiers, and chemical facilities exert pressure on the Liffey's overall water quality.

6.3.3 EPA Q Rating

The EPA's biological river water quality classification is based on macroinvertebrate biological sampling at water monitoring stations. The values and their interpretation are shown in Table 6-1.

Table 6-1 Q value rating and interpretation (EPA, n.d.)

Q rating	WFD Status	Pollution
Q5 or Q4-5	High	Unpolluted
Q4	Good	Unpolluted
Q3-4	Moderate	Slightly polluted
Q3 or Q2-3	Poor	Moderately polluted
Q2, Q1-2 or Q1	Bad	Seriously polluted

Within 10km of the proposed development, there are eight EPA water monitoring stations along the River Liffey and its tributaries which have Q ratings from 1991 to 2022, both upstream and downstream of the site. The closest is approx. 588m upstream west of the proposed development. The other seven stations are located within 10km hydrological distance of the site. These are all detailed in Table 6-2 below, from upstream to downstream.

Table 6-2 Q ratings along the River Liffey and its tributaries

Station code	Location	Year measured	Q rating	Status
RS09R010600	Br in Leixlip 4416 m u/s of the proposed site	2022	3-4	Moderate
RS09L011900	Leixlip Br (RHS) 3976 m u/s of the proposed site	2022	4	Good
RS09L012000	D/s Leixlip STP 3060 m u/s of the proposed development	1991	3	Poor
RS09G010600	GRIFFEEN - In Lucan Village (Gauging Station) 1195 m u/s of the proposed site	2022	3	Poor
RS09L012100	Lucan Br 588 m u/s proposed site	2022	3-4	Moderate
RS09L012327	LIFFEY - Mill Lane Studio 7198 m d/s of the proposed site	2002	3	Poor
RS09L012330	LIFFEY - 1km d/s Chapelizod Br (Glenaulin Park) 7792 m d/s of the proposed site	2005	3	Poor
RS09L012360	LIFFEY - 0.2 km d/s Chapelizod Br (Lynch's Lane) 8847 m d/s of the proposed site	2022	3	Poor

6.3.4 Discharges, IPPC/IE licenced companies and WWTP

There are four EPA-licenced facilities close to the proposed development (EPA, 2023), as illustrated in Table 6-3.

Table 6-3 EPA licenced activities in the vicinity of the proposed development site

Category	Name	Licence number	Status	Date of Licence
Waste Facility	Green Waste Facility (approx. 1km south of the proposed development)	W0228-01	Surrendered	27-11-2015

6.3.5 Meteorological Data

Rainfall data, extracted from the Met Éireann 1981-2010 Annual Average Rainfall Grid, has been consulted. The 30-year annual average rainfall data is presented in a 1x 1km grid, collated from 25 stations across Ireland. The closest stations to the site are Phoenix Park, Dublin Airport and Casement Aerodrome as shown in Table 6-4.

Table 6-4 Average rainfall at weather stations in the vicinity of the proposed development

Station	Total Rainfall 2023 (mm)	Total Rainfall 2024 (mm)	Total Rainfall 2025 (mm)	Average over last 3 years (mm)	Met Éireann Long Term Average
Casement Aerodrome	870.0	670.2	878.8	806.3	783.5
Phoenix Park	961.4	687.6	828.0	825.7	774.5
Dublin Airport	1001.2	670.0	804.2	825.1	772.5

The annual average rainfall in the vicinity of the scheme is between 772-826mm.

6.3.6 Designated sites

Several sites classified under the EU Habitats and Birds Directives, collectively referred to as Natura 2000 sites, as well as those under the Wildlife Act are in proximity to the proposed development.

The Rye Water Valley/Carton SAC is about 3.4 km west of the proposed development. The qualifying interests of the protected area included two different protected snails and the Petrifying springs with tufa formation (Cratoneurion). In addition, the South Dublin Bay / River Tolka Estuary SPA is about 13.6 km east downstream of the site. The Bay and the Estuary are an integral part of the internationally important Dublin Bay complex, a crucial area for wintering waterfowl. A detailed description of designated sites can be found in Chapter 4.

6.3.7 Hydrogeological environment (Groundwater)

The Dublin groundwater body (IE_EA_G_008) underlies the site. The Dublin groundwater body has been characterised as 'Good' status for 2016-2021, and its risk status is Under Review.

The site is relatively flat, with a slight topographic fall from south to north/northwest, and ranges from approx. +48 mOD at its southern end to +33 mOD at the northwestern corner, as illustrated in Figure 6-1. Beyond the site boundary, the ground continues to fall towards the Liffey, which is approx. +16 mOD at this point.

The Bedrock underlying the site consists of limestone conglomerate and calcareous shale in the eastern half, and dark grey to black limestone and shale in the western half.

Subsoil directly under the site is composed primarily of limestone till, with bedrock at surface in the northern portion of the site. The northern edge of the site is underlain by sand and gravel. Made ground and alluvium are near the southern and western edges of the site. There are no karst features within 2km of the site (GSI, 2023).

6.3.8 Aquifer Classification

The GSI mapping services (GSI, 2023) indicate the site to be located within the Locally Important Aquifer with bedrock moderately productive only in local zones and Poor Aquifer with bedrock which is Generally Unproductive except for local zones. The groundwater aquifers within the site are shown in Figure 6-2 (GSI, 2023).

Groundwater vulnerability is a term describing the hydrological and geological characteristics that control the ease with which a groundwater body may become contaminated. The vulnerability is determined by the quantity of the contaminant, travel time and attenuation capacity of the overlying sediments. These are based on the thickness of the unsaturated zone, the permeability of overlying soils and the type of groundwater recharge (point or diffuse) in the area. For example, bedrock with a thick, low permeability overburden is less vulnerable than bedrock with a thin high permeability, gravel overburden. The GSI (GSI, 2023) classifies the groundwater vulnerability within the area of site generally as extreme. Whereas the areas in the vicinity of the site are classified as having high and moderate vulnerability. Groundwater vulnerability within the site is shown in Figure 6-3 (GSI, 2023).

Estimated groundwater recharge values for the area range from 51/100 mm/yr in areas with made ground to 151/200mm/yr in areas with more permeable subsurface materials, as is illustrated in Figure 6-4.



Figure 6-1 Topography of the immediate area

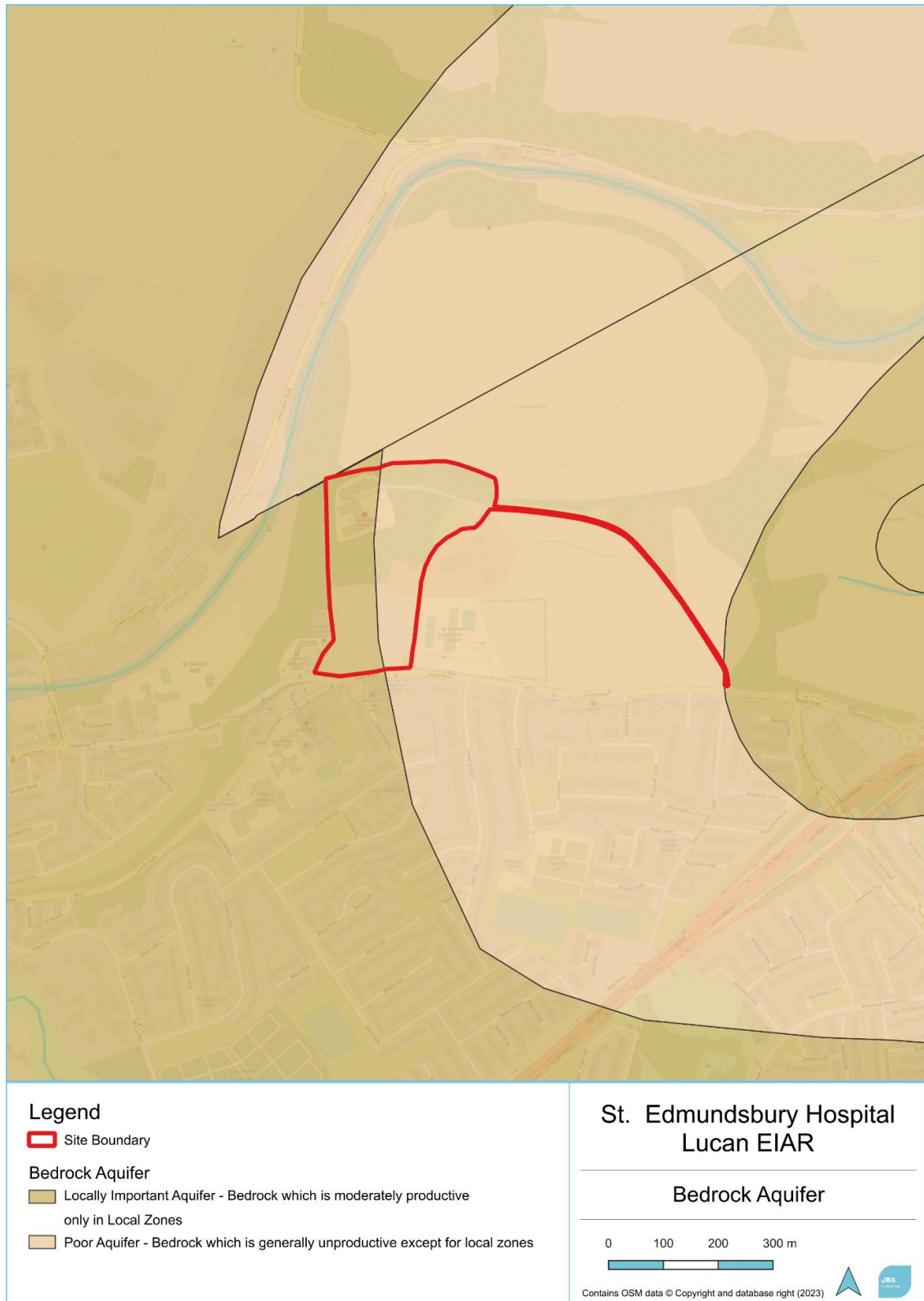


Figure 6-2 Aquifer Bedrock

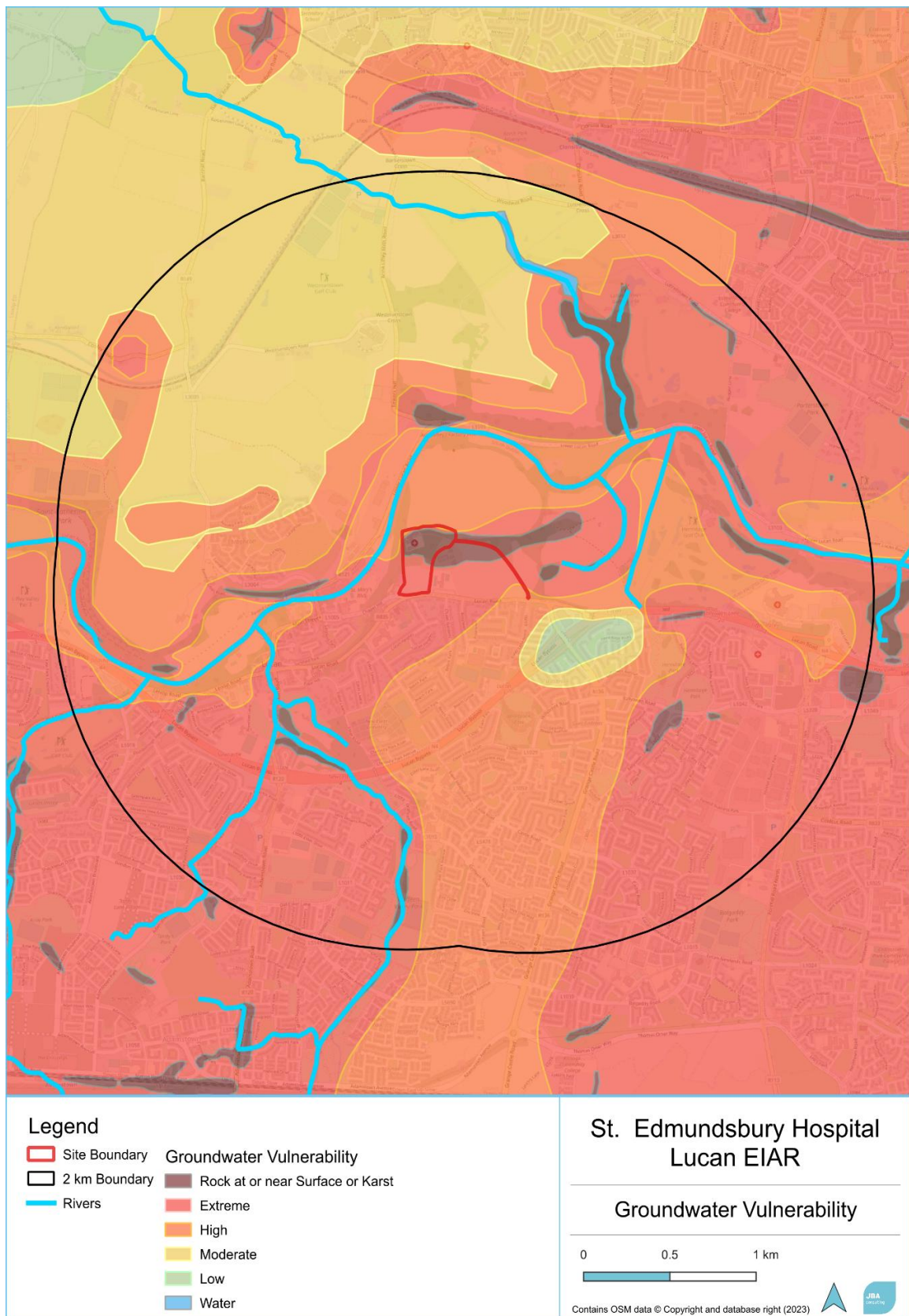


Figure 6-3 Groundwater Vulnerability



Figure 6-4 Groundwater recharge in the vicinity of the site



Figure 6-5 River Flood Risk

6.3.9 Flood Risk

Historic and predicted flood risk mapping published by the OPW on the Flood Hazard Mapping Website has been reviewed for this assessment. Historic flood data indicates that there have been no previous flood events within the proposed site area.

There have been two previous recurring flood events in the vicinity of the hospital. Neither flood event directly affected the proposed site.

The CFRAM (Catchment Flood Risk Assessment and Management) study has outlined the predicted risk for fluvial and coastal flooding scenarios. The 0.1%, 1% and 10% AEP (Annual Exceedance Probability) scenarios for the River Liffey in the vicinity of the site are shown in Figure 6-5. The site is located in Flood Zone C and is not indicated as being at risk of flooding for any of the three AEP scenarios.

6.4 Potential Effects

Predicted impacts during construction, operation and decommissioning of the proposed solar farm, and under a 'Do Nothing' scenario which presents an outline of the evolution of the baseline in the absence of the proposed development, are discussed below. This report focused on likely significant effects.

6.4.1 'Do Nothing' Scenario

If the proposed development does not go ahead, the existing land use would remain unchanged and there would be no immediate impacts to the site's hydrology and hydrogeology, allowing natural succession to continue. Existing drainage pathways on site would remain in use and would potentially change over time. As vegetation grows, overland flow pathways could naturally alter, with increased water retention due to the expanding vegetation and trees.

The 'Do Nothing' scenario is considered to be not significant, long-term, neutral, regarding water, hydrology and hydrogeology. However, it is important to note that the aging infrastructure, changing climate conditions and ongoing site activities could pose future challenges.

6.4.2 Construction Phase

Construction activities pose a significant risk to watercourses and hydrology, particularly from contaminated surface water runoff entering nearby WFD waterbodies such as the Liffey_170 or Liffey_180, or changes to watercourse morphology and flow patterns. The sections below outline the potential effects during construction on water and hydrology without any mitigation.

The key civil engineering works which will have potential effects on the surface water environment during construction are summarised below:

- During construction soil be excavated and removed from the site as part of the excavation for building foundations, drainage, access roads and car parking areas.
- Construction of the built elements of the proposed development, including drainage infrastructure and above-ground elements.
- Operations and storage of material in the Contractors Compound.
- Other construction activities will include site storage of cement and concrete materials, oils, and fuels.

The potential impacts of these works to the hydrology and hydrogeology environment (without mitigation) are discussed below.

6.4.2.1 Fine Sediment Pollution

During construction, the water environment is at risk from fine sediment pollution from the following sources:

- Excavation of, or import of, fill material on site that is stored near or adjacent to the water environment;
- Ground that is exposed following vegetation clearance adjacent, or near to, the water environment.

There are several potential pathways for fine sediment to be mobilised from these sources to receptors. Surface water runoff during a precipitation event could wash fine sediment from stores or exposed ground into the water environment, either directly via surface runoff pathways or indirectly via the stormwater drainage network. During construction, machinery may move material to a position where, should a precipitation event occur, it would be more vulnerable to mobilisation by surface water runoff (either as sheet flow or slumping of sediment piles into the channel).

Fine sediment pollution refers to both the fine sediment itself and urban pollutants that can be adsorbed onto the fine particles and transported along with them. Once fine sediment enters the water, it can disperse through the water column as suspended sediment. Suspended sediment affects physico-chemical water quality parameters by increasing turbidity and reducing dissolved oxygen. Changes in these conditions, along with toxicity effects associated with adsorbed urban pollutants, can pose a risk to the life of aquatic species. Settlement of fine sediment over instream geomorphic features such as coarse sediment deposits (e.g., riffles and bars) can smother these important physical habitat environments, rendering them unsuitable for aquatic species.

A fine sediment pollution event would be expected to immediately impact the local environment, and to subsequently affect downstream environments as the fine sediment is flushed through the system during flushing flow conditions (e.g., winter high flow events). Given flushing is expected, the effect on water quality and instream features is expected to be reversible. Taken together, the magnitude of potential impacts on water without mitigation measures in places is medium, leading to a **Moderate, Short-term, Adverse** impact on the water environment due to fine sediment pollution.

6.4.2.2 Accidental Spills and Leaks

During construction, there is a risk of localised accidental pollution incidences from the following sources:

- Spillages or leakage of temporary oils and fuels stored on site;
- Spillages or leakage of oils and fuels from construction machinery or site vehicles;
- Spillage of oil or fuel from refuelling machinery on site;
- Run-off from concrete and cement during the use of cement-based products.

There are several potential pathways for these pollutants from their sources to receptors. A direct hydrological link to surface water exists should an accidental spill or leak occur on land, and be allowed to flow overland to adjacent watercourses. A spill or leak could also discharge to the existing surface water drainage network and subsequently discharge to the river network. During construction, compaction of the soil or subsoil could occur due to the use of heavy machinery in green areas. This could reduce infiltration rates and increase surface water runoff, further acting as a pathway for potential pollutants.

The potential pollutants described above could negatively impact surface water quality if allowed to reach them. Concrete (specifically the cement component) is highly alkaline, and any potential spillages can be detrimental to surface water quality. Changes in pH of the waterbody resulting from spills of concrete material would have a consequent effect on aquatic species. Spillage of oil or other similar contaminants which are likely to be in use during construction would similarly negatively impact the water environment.

An accidental spill or leak is likely to be an isolated event if it occurs in a specific geographical area. The entire water environment as described above is therefore not likely to be affected, with effects likely only within one river sub-basin and the immediate area downstream. Taken together, the magnitude of potential impacts on water without mitigation measures in places is high, leading to a **Temporary, Significant, Adverse** impact on the water environment due to fine sediment pollution. Mitigation measures are described in Chapter 6.4 which will reduce the likelihood and magnitude of these impacts.

6.4.2.3 Hydrological Impacts

Construction activities can affect the hydrological regime of the site and nearby connected waterbodies. The proposed development will require shallow excavation below existing levels across the surface water attenuation tank of the hospital, as shown on the Proposed Foul and Storm Layout. The existing surface water hydrological regime consists of surface drainage

infrastructure which takes surface runoff and discharges to the River Liffey. Surface runoff also infiltrates to the ground naturally.

The following are potential effects on the hydrological regime on-site during the construction phase:

- Changes to runoff and flow pathways. Sources include stockpiling of material, changes in vegetation or land cover, and temporary earthworks or embankments.
- Temporary ponding

The proposed construction activities have the potential to temporarily alter the hydrological regime in the study area. This will be a **Short term, Significant, Adverse** effect.

6.4.2.4 Groundwater

During construction, the groundwater environment is at risk from accidental pollution from the following sources:

- Excavation of, or import of, fill material on site;
- Run-off and erosion from soil stockpiles;
- Spillages or leakage of temporary oils and fuels stored on site;
- Spillages or leakage of oils and fuels from construction machinery or site vehicles;
- Spillage of oil or fuel from refuelling machinery on site;
- Run-off from concrete and cement during the use of cement-based products.

There are several potential pathways for fine sediment and pollutants to be mobilised from these sources to groundwater and drinking water receptors.

Excavation for the grid route may encounter groundwater, necessitating the pumping of groundwater inflows. This process will result in a temporary localised drawdown of the water table and may require discharges to nearby surface water channels. Such excavation activities can alter the natural groundwater flow, potentially affecting local wells, springs and other water sources. The disturbance of soil and rock layers may introduce fine sediment and pollutants into the groundwater, impacting its quality. These activities can generate suspended solids in drainage water, increasing the risk that sediment-laden recharge water could enter the underlying aquifer.

Furthermore, the release of water from construction site areas has the potential to impact groundwater and surface water if site conditions are not suitable. The temporary construction compound will need to be carefully managed to mitigate these risks. Concrete and other cement-based products are highly alkaline and corrosive, and their release into the site drainage system can significantly negatively impact water quality as they percolate into the ground. There is also a risk of poor quality or contaminated water entering the groundwater system below the proposed development site and flowing towards existing water sources and public water supplies. These impacts require careful management to mitigate potential environmental impacts.

A fine sediment pollution event or an accidental spill or leak in the groundwater environment is likely to affect the local area, as well as any surface waterbodies or water sources that are hydrologically connected or within the same groundwater system. Mitigation measures will be required to reduce the impact to these water sources and to safeguard their quality and availability. The magnitude of potential impacts on these groundwater features without mitigation measures in place is high, leading to a **Temporary, Significant, Adverse** impact on the groundwater environment due to fine sediment pollution or accidental spills and leaks. Mitigations measures are outlined in Section 5 to reduce these effects.

6.4.2.5 Flood Risk

The proposed development is not located in Flood Zones A or B, and the construction is expected to have no effect on floodplain storage and conveyance. As activities such as excavation, earthworks and construction will occur only within the site boundary, construction will not increase flood risk off site.

There is potential for localised flooding on site, such as in excavations, due to extreme rainfall.

6.4.2.6 Potential Effects

Without mitigation measures in place, the potential effects on the water environment are considered to be **Short term, Significant, Adverse** during the construction phase.

6.4.3 Operational Phase

The proposed operational stage drainage will be similar to the existing scenario. The surface water will flow into a new surface water sewer, 1 no. new surface water detention/attenuation tank (952m³), and seep underground through the proposed permeable paving and bio-retention systems on site. The proposed development also includes a bypass separator at the entrance of the Hospital (off Lucan Road) before the new surface water sewer connects to the existing sewer, separating pollutants from the water before being released.

It is expected that once operational, the ground surface around the hospital will be allowed to remain as grass vegetation. It is anticipated that water will percolate into the soil beneath the hospital, while the access paths will be made of permeable material and temporary swales or equivalents will be used to collect runoff, which will discharge to the ground through percolation areas. Infiltration to ground and discharge to surrounding drainage channels will therefore remain at similar levels to the current scenario.

Surface water runoff from the site to the River Liffey is not expected to increase during the operational stage, as the discharge rate from the site will be limited to the existing greenfield rate.

Once operational, the expected impact on site hydrology and hydrogeology is **Long term, Not Significant, Neutral**.

6.4.4 'Do Nothing' Scenario

In the event of the proposed development not being constructed, there would be no resulting impacts on hydrology at the site, and the site would continue in a natural succession. Existing drainage infrastructure at the site would continue to age, with the potential for wear and tear over time to contribute to failures in the system. As the vegetation at the site continues to grow and develop, overland flow pathways could alter and continue developing naturally. Growing vegetation and trees would have greater water retention capability.

With climate change, the frequency and intensity of rainfall is expected to increase. The existing drainage infrastructure at the site could be exceeded, with pluvial flooding increasing.

The Do-Nothing effect is considered to be **Long term, Not Significant, Neutral** with regard to water and hydrology.

6.5 Mitigation Measures

In the impact assessment discussed above, a range of potential effects on water were identified. Mitigation measures in the construction and operation phase of the proposed development will be implemented to reduce these adverse effects. Most measures are required during the construction phase as it will pose the greatest level of risks due to the construction activity on site, plant construction and use of construction materials and the soil on site. In the sections below the mitigation measures for the 'Do Nothing' scenario, construction phase and operation phase are discussed.

6.5.1 Construction Phase

The mitigation concerning the construction phases is discussed in 3 sections: surface water runoff, chemical pollution, silt and suspended solids, and changes to runoff and flow pathways.

6.5.1.1 Surface Water runoff

Surface water generated on site from rainfall will be discharged initially to settlement tanks. Prior to discharge off-site, the surface water will pass through a treatment train consisting of silt traps and settlement tanks to remove suspended solids and hydrocarbons. Regular visual inspection of the discharged surface water and monitoring of the treatment train will be undertaken.

Temporary storage of soil will be carefully managed to prevent any potential negative effects on the receiving hydrological environment. The material will be stored away from any existing drains within the site. Movement of material will be minimised to reduce degradation of soil structure and generation of dust. Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise potential for water ingress into excavations.

Weather conditions will be monitored when planning construction activities, to minimise risk of runoff from the site and the suitable distance of topsoil piles from drainage ditches/sewerage systems

will be maintained. In the event of an extended period of dry weather, stockpiles will be dampened using a water spray. The level of spraying will be sufficient to just dampen the soil to avoid dust blow and avoid excessive runoff that could arise during this process. Site roads will also be subject to similar mitigation to avoid dust blow.

6.5.1.2 Chemical Pollution

Mitigation measures for the protection of water quality from chemical pollution involve environmental operating plans, chemical storage, and Emergency Response Procedures.

At construction stage, the following mitigation measures will be implemented:

- The contractor will construct a site compound at a location at least 10m remote from any water bodies or drains. The compound may be moved or altered dependent on construction needs over the course of the project.
- Any lubricants or hydraulic oils will be stored in bunded containers in designated bunded areas. Deliveries of fuel and chemicals will be supervised.
- Spill protection equipment such as absorbent mats, socks and sand will be available to be used in the event of an accidental release. These will be disposed of correctly if used and replaced with new ones immediately. Disposal records for used adsorbent will be retained by the Site Manager.
- All materials taken on-site will be clearly labelled and stored in sealable containers.
- The diesel fuel tank will be adequately bunded (110%) and the filling nozzle will be stored within the bunded area. The Site Manager will as part of their daily site walkaround check the integrity of the fuel tank(s). The condition of the tanks will be recorded by the Site Manager.
- Re-fuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in a designated area which will be away from any existing surface water drains which could also provide pathways to the underlying geology.
- The contractor will ensure that no hazardous or noxious materials enter a watercourse or drain. Should this situation arise emergency procedures will be activated.
- During all works the weather forecast will be monitored and a contingency plan developed to prevent damage or pollution during extreme weather. Machinery and equipment will not be left on-site during such events and will be removed beforehand.
- Concrete washout will not be allowed within 10 metres of an existing surface water drainage point. Washouts are only allowed to take place into containment in designated areas with an impervious surface.
- The Contractor is to clean equipment prior to delivery to the site. The Contractor is to avoid using any equipment which leaks fuel, hydraulic oil or lubricant. The Contractor is to maintain equipment to ensure efficiency and to minimise emission.
- Precast elements will be maximised to avoid wet concreting in close proximity to water.

6.5.1.3 Silt and suspended solids

Mitigation measures for the protection of water quality from silt and suspended solids on site involve silt control, particularly at any drains or open excavations.

At construction stage, the following mitigation measures will be implemented:

The contractor will construct a site compound at a location remote from any drains.

- All soil stockpiles will be covered (vegetated or with tarpaulins/similar material) to minimise the risk of rain runoff / wind erosion. Vegetation will be established as soon as possible on all exposed soils.
- During extended dry periods, soil stockpiles will be dampened periodically to minimise the risk of airborne particles entering watercourses.
- Any temporary storage of spoil, hardcore, crushed concrete or similar material will be stored as far as possible from any surface water drains and stored in receptacles where possible. To minimise the risk of contamination, the stockpiled material will be removed off-site as soon as possible.

- Surface water drain gratings in areas near or close to where stockpiles are located will be covered by appropriate durable polyurethane covers or similar.
- Should mobilisation of soil particles/pollution be noted in the course of weekly monitoring by the Site Manager, works will stop temporarily, and the Site Manager will initiate the interception and treatment of pollution/silt run-off.
- Silt fencing and silt bags shall be put in place downstream of exposed soils or soil stockpiles to contain surface water runoff from the site.
- Appropriate installation of silt fence is crucial, poor compaction of the soil could lead to infiltration and water flowing underneath the silt fence, resulting in the washout of retained sediment.

6.5.1.4 Changes to runoff and flow pathways

The proposed development will require the removal of the existing site drainage system and provision of a new system. Before the operation of the new drainage system, mitigation measures to minimise effects on runoff and flow pathways involve the following:

- The contractor will construct a site compound at a location remote from any drains or open excavations.
- Vegetation will be established as soon as possible on all exposed soils.

6.5.2 Operational Phase

The proposed development has been designed in accordance with the Greater Dublin Strategic Drainage Strategy guidelines (GDSDS) and will incorporate SuDS features, which will help to mitigate against additional surface water runoff, as per the Flood Risk Assessment for the proposed development, as well as silt traps and hydrocarbon interceptors.

During the operational phase, regular visual inspection of the silt traps and hydrocarbon interceptors should be carried out to ensure they are operating correctly. No additional mitigation measures are required.

6.6 Monitoring

6.6.1 Construction Phase

During construction, weekly visual monitoring will take place by the Site Manager to ensure that water draining from the site is not affected by the proposed development. This will take place during the regular site audits during the construction process.

Surface water collected in settlement tanks will be monitored prior to discharge. Samples will be taken and the pH, conductivity, chemical oxygen demand, total petroleum hydrocarbons and suspended solids levels will be recorded. The monitoring results will be compared to the allowable limits given in the European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (S.I. No. 272 of 2009). If the results show an exceedance in the allowable levels, this exceedance will be recorded, and the appointed contractor will review the mitigation measures and remedy them to ensure compliance with the surface water discharge limits. Surface water will be discharged from the site into the existing surface water infrastructure after it has undergone treatment. A record of any upgrades/changes to the mitigation measures will be recorded.

The contractor is required to monitor the weather forecasts to inform the programming of earthworks and stockpiling of materials.

If the mitigation measures for the construction phase are observed to be insufficient or inefficient (i.e., elevated suspended solids, pH, conductivity, chemical oxygen demand, or total petroleum hydrocarbons are detected during monitoring prior to discharge), the discharge will be halted, and the mitigation measures will be revised and reimplemented. Further sampling will verify the success of the revised/updated surface water management. The affected water will be conveyed to the revised/updated treatment train and put through a hydrocarbon interceptor and settlement tanks to ensure compliance with the required levels in the treated water.

Regularly and after runoff events, silt fences should be tested to check if they require maintenance because they are full or have been compromised by construction equipment. The ASTM silt fence

specification suggests removing sediment deposits from under the fence when they reach 50 percent of the fence's height or placing a second fence.

6.6.2 Operational Phase

Once operational, silt traps and hydrocarbon interceptors will be visually inspected on a regular or annual basis. Any spillages onsite will be acted upon immediately. No other monitoring measures are required during the operational phase.

6.7 Residual Impacts

6.7.1 Construction Phase

With the implementation of the mitigation measures outlined above, the proposed development will have no negative effects on WFD surface waterbodies during construction. The status of surface waterbodies in the area (Liffey_170 and Liffey_180) will not be deteriorated due to the construction activities. Following the implementation of the mitigation measures, the effects during the construction phase will be **Short-term, Imperceptible, Neutral**.

6.7.2 Operational Phase

The design of the scheme has been such that there are no predicted effects on the water and hydrogeological environment during the operational phase of the development. Both the proposed green roof and the bio-retention system will efficiently reduce the surface water runoff rate. The proposed discharge rate does not exceed the existing greenfield runoff rate, while the proposed drainage design includes measures for the attenuation of surface water. Once operational, the proposed development will not lead to a deterioration of water status of either the Liffey_170 or Liffey_180 surface waterbodies, nor will it jeopardise the attainment of good water status for either of these waterbodies. Overall, the effects of the proposed development will be **Long-term, Imperceptible, Neutral**.

6.7.3 Do Nothing' Scenario

In the event of the proposed development not being constructed, there would be no resulting effects on hydrology at the site, and the site would continue in a natural succession. Existing drainage infrastructure at the site would continue to age, with the potential for wear and tear over time to contribute to failures in the system. As the vegetation at the site would continue to grow and develop, overland flow pathways could be altered and continue developing naturally. Growing vegetation would have greater water retention capability.

With climate change, the frequency and intensity of rainfall is expected to increase. The current drainage infrastructure at the site could become overwhelmed, with pluvial flooding increasing.

The effects for the 'Do-Nothing' scenario are considered to be **Long-term, Not significant, Neutral** with regard to water and hydrology.

6.8 Interactions

The EIAR must also consider in-combination effects, or the interactions between the different factors discussed.

Biodiversity

Effects on water quality, hydrology and hydrogeology can have further effects on biodiversity and ecology, through the mobilisation of silts, dusts, suspended solids, oils, or chemicals. On entering watercourses, these can negatively affect fish and aquatic ecology, as well as have an effect on Natura 2000 sites further downstream. These effects are further discussed in the Biodiversity chapter 4 of this EIAR. While the proposed development site is not directly connected to the River Liffey or other watercourses, surface water can make its way there through drainage networks. Following implementation of mitigation measures outlined in this chapter, including the use of silt fences and settlement trains during construction, effects on habitats, flora, and fauna from water and hydrology will be **Short-term, Imperceptible, Neutral**.

Material Assets

The material assets on site (surface and stormwater drainage) are assessed in Chapter 9. The potential for effects on water and hydrology from these assets has been assessed in this chapter. Due to the intricate design of the surface water and stormwater drainage systems, any interaction between material assets and water will be **Long-term, Imperceptible, Neutral**.

Construction vehicles moving on site during the construction phase could result in hydrocarbons entering the surface water drainage system, leading to effects downstream. This is mitigated against by measures included in this chapter and the project CMP (Egis Ltd), which outline the site compound location (away from any drains) and require all vehicles to be maintained frequently and to carry spill kits at all times. Without mitigation in place, this could lead to a temporary significant negative effect. However, with the measures outlined in this chapter, the interaction between these will be **Temporary, Imperceptible, Neutral**.

There is potential for an increase in frequency of rainfall in the future as a result of climate change. This will result in greater pluvial flooding risk at the site, as stated in Chapters 7 (Air and Climate) and 8 (Noise and Vibration). The drainage and layout design include adequate attenuation and drainage to account for climate change effects. Therefore, the effects will be localised and **Long-term, Imperceptible, Neutral**.

6.9 Potential Cumulative Effects

Cumulative effects are the result of several minor effects combining to create a more significant effect. The assessment of cumulative effects considers existing stresses on the water environment (i.e., surface water runoff, urban wastewater drainage, from existing developments in the surrounding area) as well as developments close to this development that are in planning or are underway which are outlined in Chapter 13. Small extensions or alterations to existing dwellings were not considered for the purposes of assessing potential cumulative effects here, as they will not have an effect on hydrology or hydrogeology.

7 Air and Climate

7.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) assesses the air quality and climate impact of the proposed healthcare development within the grounds of the existing St Edmundsbury Hospital in Lucan, South Dublin.

The subject site located in Lucan, Co. Dublin comprises the grounds and premises of the Saint Edmundsbury Hospital, and is bounded to the north by farmland, a school to the east, by the Lucan road to the south and by the River Liffey with its adjacent land and a pre-school to the west.

In terms of potential air quality impact assessment, the project has the potential to give rise to construction dust impact during the construction stage and during the operation of the hospital, there is the potential for air quality impact due to associated road traffic movements and heating emissions.

7.2 Assessment Methodology

The key methodology documents of relevance to the air quality impact assessment are as follows:

- Institute of Air Quality Management (IAQM) – Land-Use Planning & Development Control: Planning For Air Quality (January 2017)
- Institute of Air Quality Management, Guidance on the assessment of dust from demolition and construction (2014)
- DMRB Sustainability & Environment. Appraisal LA 105 Air Quality. DMRB LA105 Air quality (formerly HA 207/07, IAN 170/12, IAN 174/13, IAN 175/13, part of IAN 185/15), (Highways Agency, 2020);
- Department for Environment, Food and Rural Affairs (DEFRA) Air Quality Management Technical Guidance LAQM.TG (22) (August 2022).
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA 2022);
- Transport Infrastructure Ireland, Air Quality Assessment of Specified Infrastructure Projects Overarching Technical Guidance, PE-ENV-01106 (Dec. 2022).
- Institute of Air Quality Management, A guide to the assessment of air quality impacts on designated nature conservation sites (2020)

7.2.1 Ambient Air Quality Standards

European Union directives set down air quality standards in Ireland and the other member states for a variety of pollutants.

The Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC) was published in May 2008. It replaced the Framework Directive and the first, second and third Daughter Directives. The fourth Daughter Directive (2004/107/EC) will be included in CAFE at a later stage. The limit and target values for both Directives are outlined below.

The CAFE Directive was transposed into Irish legislation by the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011). It replaces the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004) and S.I. No. 33 of 1999.

The fourth Daughter Directive was transposed into Irish legislation by the Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations 2009 (S.I. No. 58 of 2009).

The Environmental Protection Agency (EPA) monitors various air pollutants in Ireland to ensure we meet these standards. Table 7-1 outlines the limit or target values specified for nitrogen dioxide (NO₂) and particulates (PM₁₀) relevant to this air quality impact assessment.

Table 7-1 Relevant Limit Values outlined in the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011)

Pollutant	Air Quality Objective	
Nitrogen Dioxide	Annual mean	40 µg/m ³
	1-hour mean	200 µg/m ³ , not to be exceeded >18 times a year
Particles (PM10)	Annual mean	40 µg/m ³
	24 hour mean	50 µg/m ³ , not to be exceeded >35 times a year
Particles (PM2.5)	Annual mean	20 µg/m ³

7.2.2 Road Traffic Emissions:

The impact prediction model used to assess road traffic emissions in the air quality impact assessment is the Design Manual for Roads & Bridges (DMRB) Screening Model, published by the Highways Agency. The DMRB Screening Method can be run to predict pollutant concentrations at receptor locations near to roads. It can be used to predict annual mean concentrations of nitrogen dioxide (NO₂) and PM10, as well as oxides of nitrogen (NO_x), carbon monoxide, benzene and 1,3-butadiene. It also predicts the number of exceedances of 50 µg/m³ as a 24-hour mean PM10 concentration. The model requires input data on Annual Average Daily Traffic flow (AADT), annual average speeds, the proportion of different vehicle types, the type of road, and the distance from the centre of the road to the receptor location. The DMRB Screening Method is referred to as appropriate assessment methodology within the Local Air Quality Management Technical Guidance document TG (22).

The method to convert roadside NO_x to NO₂ within the DMRB model was based on measurements made between 1999 and 2001. Recent evidence shows that the proportion of primary NO₂ in vehicle exhaust has increased. This means that the relationship between NO_x and NO₂ at the roadside has changed from that currently used in the DMRB model. An updated NO_x to NO₂ calculator is available from the DEFRA website (version 8.1, August 2020). The calculator applies to all road types and can also be used to estimate roadside NO_x from roadside NO₂ measurements. The use of the DMRB model has been adapted to use the new calculator in accordance with the relevant instructions.

DMRB model validation work carried out by the Highways Agency has indicated that the model may significantly under-predict concentrations of nitrogen dioxide alongside urban city-centre roads classified as 'street canyons'. In this context, a street canyon may be defined as a relatively narrow street with buildings on both sides, where the height of the buildings is generally greater than the width of the road. It has been decided that on review of the streetscapes in proximity to the site that a street canyon effect is unlikely to occur as there are relatively open areas in close proximity to the site.

DEFRA has stated that if the annual mean objectives are not exceeded, it may be confidently assumed that the short-term (1-hour) objectives will also be met. However, if this approach is used, then care must be taken to include relevant locations where the hourly objectives might apply. If the annual mean nitrogen dioxide concentration is greater than 60 µg/m³, then there is a risk that the 1-hour objective may also be exceeded.

7.2.3 Space Heating Emissions:

In terms of space heating, the proposal is expected to utilise electric heating for both hot water (hot water cylinder with an immersion) and space heating. Therefore, there will be no pollutant emissions to atmosphere from oil or gas boiler heating sources.

7.2.4 Construction Dust

This Construction Dust Impact Assessment has been carried out to assess the impact of the construction phase of the proposed development.

The type of activities that could cause fugitive dust emissions are earthworks; handling and disposal of spoil; wind-blown particulate material from stockpiles; handling of loose construction materials; and movement of vehicles, both on and off site. The main effect of any dust emissions, if not mitigated, could be annoyance due to soiling of surfaces, particularly windows, cars and laundry. However, it is normally possible, by implementation of proper control, to ensure that dust deposition does not give rise to significant adverse effects. The Dust Impact Assessment has been

undertaken in accordance with Guidance on the Assessment of Dust from Demolition and Construction (IAQM) (January 2024, Version 2.2) to predict the risk of dust impacts and the level of mitigation that is required to control the residual effects to a level that is “not significant”.

7.2.5 Dust Deposition Guidelines

Dust particles can be classified into those that are easily deposited and those that remain suspended in the air for long periods. This division is useful as deposited dust is usually the coarse fraction of particulates that causes dust annoyance, whereas suspended particulate matter is implicated more in exposure impacts. Airborne particles have a large range of diameters, from nanoparticles and ultrafine particles (diameters less than $0.1\mu\text{m}$) to the very large particles with diameters up towards $100\mu\text{m}$. There is no clear dividing line between the sizes of suspended particulates and deposited particulates, although particles with diameters $>50\mu\text{m}$ tend to be deposited quickly and particles of diameter $<10\mu\text{m}$ (PM10) have an extremely low deposition rate in comparison. Therefore, the size of suspended and deposited dust particles affects their distribution and as such requires two very different approaches to sampling these fractions. PM10 is the fraction of airborne (suspended) particulates which contains particles of diameter less than $10\mu\text{m}$. PM2.5 is the fraction of airborne (suspended) particulates which contains particles of diameter less than $2.5\mu\text{m}$. PM10 and PM2.5 particles can penetrate deep into the respiratory system increasing the risk of respiratory and cardiovascular disorders. Total Suspended Particles (TSP) is the term used when referring to larger particles which do not have a specified size limit. It is common for TSP to be measured alongside PM10 and PM2.5 particularly at industrial sites when dust monitoring is undertaken.

Particulate matter can emanate from natural and anthropogenic sources. Natural sources include sea salt, forest fires, pollen and moulds. Natural sources are unregulated and harder to control. Anthropogenic sources can be regulated and understanding the sources of particulate matter is very important. PM10 is most commonly associated with road dust and construction activities. Wear and tear of brakes and tyres on vehicles and crushing activities at construction sites can all contribute to a rise in PM10. PM2.5 is associated with fuel burning, industrial combustion processes and vehicle emissions. Larger particles ($100\mu\text{m}$ diameter) are likely to settle within 5-10m of their source under a typical mean wind speed of 4-5 m/s, and particles between 30- $100\mu\text{m}$ diameter are likely to settle within 100m of the source. Smaller particles, particularly those $<10\mu\text{m}$ in diameter, i.e. PM10, have a greater potential to have their settling rate impeded by atmospheric turbulence and to be transported further from their source. Dust emissions are exacerbated by dry weather and high wind speeds. The impact of dust, therefore, also depends on the wind direction and the relative location of the dust source and receiver.

Currently, no statutory standards or limits exist for the assessment of dust deposition and its tendency for causing nuisance. Similarly, no official air quality criterion has been set at a European or World Health Organisation (WHO) level, although a range of national ‘yardstick’ criteria from other countries is found in literature.

In England and Wales, a ‘custom and practice’ limit of $200\text{ mg/m}^2/\text{day}$ is sometimes referenced using Frisbee-type Deposition Gauges. This value was derived by multiplying a historical, typical UK median background by 3.5 (which was the ratio of the 95th percentile to the median). It should be noted that because background dust levels can vary significantly from place to place and with season, the authors Vallack & Shillito were clear that the preferred approach is to calculate a bespoke site-specific “complaints likely” dust guideline, where sufficient local baseline monitoring data is available (at least 12-months) based on 3.5 times the median background level. However, such bespoke local baseline data is often not available and in such cases the authors recommended using as a fall-back the 95th percentile of typical UK background data. It is important that the limitations of the $200\text{ mg/m}^2/\text{day}$ benchmark are appreciated: firstly, it is simply a custom and practice yardstick and it was never based on actual dose-response data; secondly, in deriving this default “complaints likely” guideline, the authors used a dataset that was quite old and not necessarily indicative of today’s background levels.

The German TA Luft Regulations, “Technical Instructions on Air Quality Control” state that total dust deposition (soluble and insoluble, measured using Bergerhoff type dust deposit gauges as per German Standard Method for determination of dust deposition rate, VDI 2119) should not exceed a dust deposition rate of $350\text{ mg/m}^2/\text{day}$ (when averaged over a 30 ± 2 day period). The use of this limit value is appropriate to minimise the impact of airborne dust levels on the receiving

environment beyond the site boundary. The German TA Luft criteria for 'possible nuisance' and 'very likely nuisance' are 350 mg/m²/day and 650 mg/m²/day, respectively.

These go some way to addressing the view that the annoyance impact (and hence potential for complaints) depends on the worsening of dust levels above existing background levels.

In 2005, the UK Highways Agency released an Interim Advice Note 61/05 'Guidance for Undertaking Environmental Assessment of Air Quality for Sensitive Ecosystems in Internationally Designated Nature Conservation Sites and SSSIs' as a supplement to the Design Manual for Roads and Bridges (DMRB) Guidelines. This interim guidance states that dust or particles falling onto plants can physically smother the leaves affecting photosynthesis, respiration and transpiration. The literature suggests that the most sensitive species appear to be affected by dust deposition at levels above 1,000 mg/m²/day which is considerably greater than the level at which most dust deposition may start to cause a perceptible nuisance to humans. As such, once dust deposition rates are maintained within the guidelines for human nuisance the impact of dust deposition on sensitive ecosystems is considered negligible. Therefore, the following dust deposition limits are typically recommended;

- Dust Deposition Rate limit = 350 mg/m²/day (averaged over a 30+/-2 day period using Bergerhoff Gauge Method).
- Dust Deposition Rate limit affecting sensitive ecological receivers = 1,000 mg/m²/day
- PM₁₀ 24 Hour Mean concentration limit = 50 µg/m³ not to be exceeded more than 35 times a calendar year
- PM₁₀ Annual Mean concentration limit = 40 µg/m³
- PM_{2.5} Annual Mean concentration limit = 25 µg/m³

7.2.6 Receptor Locations

The sensitive residential receptors considered as part of the air quality assessment are the future residents of the proposed hospital, St Andrews National School, Canon Despard Centre (The Village Montessori School) and residential properties in close proximity to the proposed hospital development site.

The receptor locations assessed in the DMRB traffic emissions screening tool are summarised in Table 7-2 and shown in Figure 7-1.

Table 7-2 Sensitive Residential Receptor locations assessed in the DMRB Screening Method of Traffic Emissions Air Quality Impact Assessment

Receptor Description and Location	Grid Reference	Distance to Road
R1 – Future residents of proposed development	304044, 235548	@ 14m from façade to centre of Lucan Road @ 45m from façade to centre of Chapel Hill @ 102m from façade to proposed site entrance
R2 - Failte, 32, Lucan Road, Lucan	304135, 235518	@ 28m from façade to centre of Lucan Road (West) @ 45m from façade to proposed site entrance
R3 – St Andrews National School, Lucan Road, Lucan	304202, 235585	@ 43m from façade to centre of Lucan Road (East) @ 56m from façade to proposed site entrance
R4 – Canon Despard Centre / The Village Montessori Preschool, Chapel Hill, Lucan	303936, 235552	@ 17m from façade to centre of Chapel Hill @ 55m from façade to centre of Lucan Road @ 209m from façade to proposed site entrance

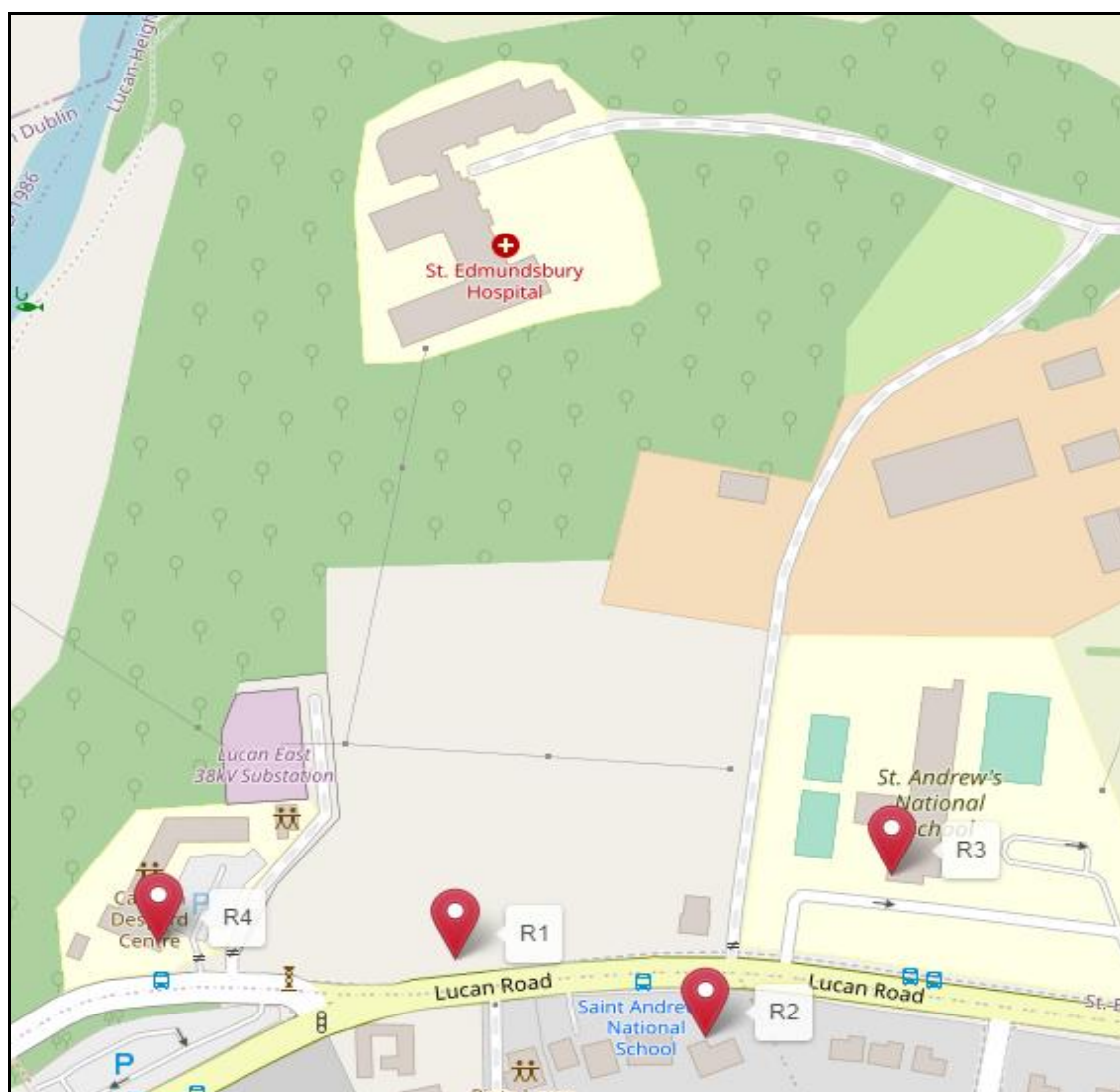


Figure 7-1: Sensitive Residential Receptor locations assessed in the DMRB Screening Method of Traffic Emissions Air Quality Impact Assessment

In line with TII and DMRB guidance, consideration of air quality impacts should also be given to ecological habitats with a national or international designation that are located within 200m from the roads assessed within the study area and where a significant change in AADT flows (>5%) will occur. The proposed hospital development site is located directly adjacent to the designated Liffey Valley pNHA (Proposed Natural Heritage Area site code 000128).

7.3 Potential Effects

In terms of the 'Significance of Potential Environmental Effects' the magnitude (scale of change) has been determined by considering the impacts of the proposed development on air quality with reference to the baseline conditions and environmental assessment criteria.

7.3.1 Describing the Impact:

The rationale for describing the impact of the Proposed Hydrogen Green Energy project is derived from the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) guidance (EPUK & IAQM) "Land-Use Planning & Development Control: Planning for Air Quality (January 2017). There is a two-stage process to be followed in the assessment of air quality impacts:

- A qualitative or quantitative description of the impacts on local air quality arising from the development; and
- A judgement on the overall significance of the effects of any impacts

Table 7-3: Impact descriptors for individual receptors

Long term average Concentration at Receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Moderate
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial
Explanation 1. AQAL = Air Quality Assessment Level, which may be an air quality objective, EU limit or target value, or an Environment Agency 'Environmental Assessment Level (EAL)'. 2. The Table is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which then makes it clearer which cell the impact falls within. The user is encouraged to treat the numbers with recognition of their likely accuracy and not assume a false level of precision. Changes of 0%, i.e. less than 0.5% will be described as Negligible. 3. The Table is only designed to be used with annual mean concentrations. 4. Descriptors for individual Receptors only; the overall significance is determined using professional judgement (see Chapter 7). For example, a 'moderate' adverse impact at one Receptor may not mean that the overall impact has a significant effect. Other factors need to be considered. 5. When defining the concentration as a percentage of the AQAL, use the 'without scheme' concentration where there is a decrease in pollutant concentration and the 'with scheme;' concentration for an increase. 6. The total concentration categories reflect the degree of potential harm by reference to the AQAL value. At exposure less than 75% of this value, i.e. well below, the degree of harm is likely to be small. As the exposure approaches and exceeds the AQAL, the degree of harm increases. This change naturally becomes more important when the result is an exposure that is approximately equal to, or greater than the AQAL. 7. It is unwise to ascribe too much accuracy to incremental changes or background concentrations, and this is especially important when total concentrations are close to the AQAL. For a given year in the future, it is impossible to define the new total concentration without recognising the inherent uncertainty, which is why there is a category that has a range around the AQAL, rather than being exactly equal to it.				

The suggested framework for describing the impacts is set out in Table 6.3 of the EPUK & IAQM guidance document and is shown in Table 7-3. The term Air Quality Assessment Level (AQAL) has been adopted as it covers all pollutants, i.e. those with and without formal standards. AQAL is used to include air quality objectives or limit values where these exist. The Environment Agency uses a threshold criterion of 10% of the short term AQAL as a screening criterion for the maximum short-term impact. The EPUK & IAQM guidance adopts this as a basis for defining an impact that is sufficiently small in magnitude to be regarded as having an insignificant effect.

7.3.2 Assessing Significance:

The rationale for the assessment of significance is derived from the EPUK & IAQM Guidance (paragraphs 7.1-7.12 referring to Table 6.3) and relates to Table 7-3.

Impacts on air quality, whether adverse or beneficial, will have an effect on human health that can be judged as 'significant' or 'not significant'. An 'impact' is the change in the concentration of an air pollutant, as experienced by a Receptor. This may have an 'effect' on the health of a human Receptor, depending on the severity of the impact and other factors that may need to be taken into account. The impact descriptors set out in Table 7-3 are not, of themselves, a clear and unambiguous guide to reaching a conclusion on significance. These impact descriptors are intended for application at a series of individual Receptors. Whilst it may be that there are 'slight', 'moderate' or 'substantial' impacts at one or more Receptors, the overall effect may not necessarily be judged as being significant in some circumstances.

Any judgement on the overall significance of effect of a development will need to take into account such factors as:

- the existing and future air quality in the absence of the development;
- the extent of current and future population exposure to the impacts; and
- the influence and validity of any assumptions adopted when undertaking the prediction of impacts.
- Other factors may be relevant in individual cases.

7.3.3 Baseline Air Quality

An air quality monitoring station located in Lucan (Grid Ref: 53.3491°N, -6.4503°E), approximately 1.45km southwest of the proposed development, monitors for nitrogen dioxide (NO₂), and particulate matter (PM₁₀ and PM_{2.5}). The air quality monitoring station location relative to the site of the proposed hospital development site is shown in Figure 7-2.

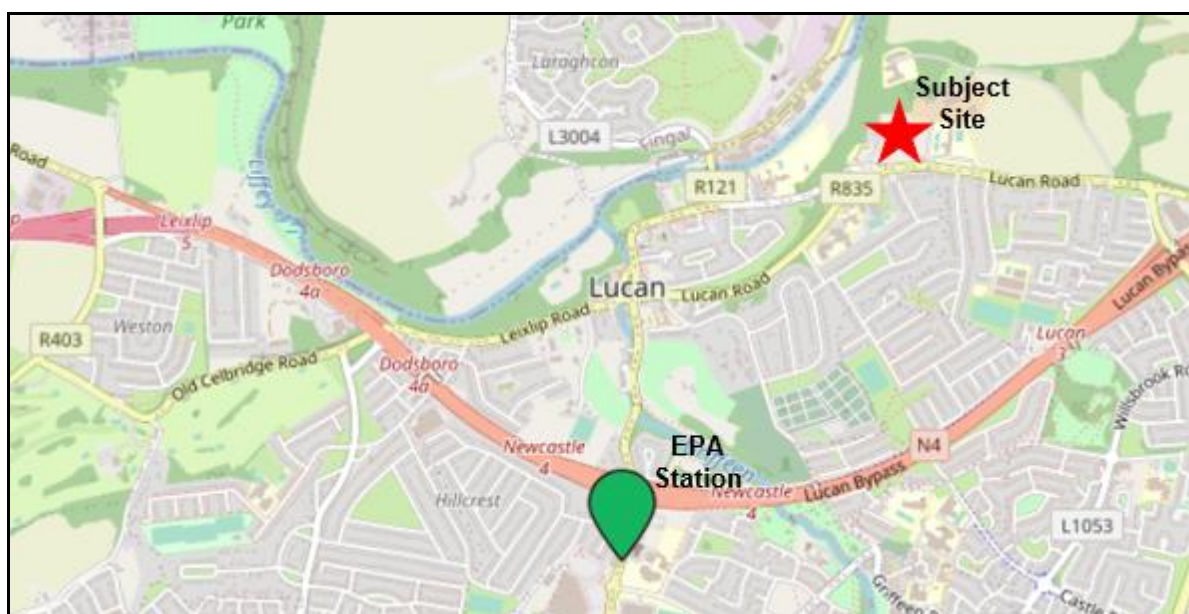


Figure 7-2: Air Quality Station, Lucan, Co. Dublin

Table 7-4 below outlines the annual mean nitrogen dioxide (NO₂), and particulate matter (PM₁₀ and PM_{2.5}) concentrations from January 2023 to October 2023 recorded at the Lucan ambient air quality monitoring station.

Table 7-4: Annual Average Nitrogen Dioxide (NO₂) and Particulate Matter (PM₁₀ and PM_{2.5}) concentrations at Lucan (01/01/2023 - 11/10/2023)

Station	Period	Measured Concentration (µg/m ³)		
		NO ₂	PM ₁₀	PM _{2.5}
Lucan	01.01.2023 – 27.10.2023	20.81	12.04	6.71
Annual Mean Limit Value		40 µg/m ³	40 µg/m ³	25 µg/m ³

The Air Quality Standards annual mean limit values for Nitrogen Dioxide (NO₂) and Particulate Matter (PM₁₀ and PM_{2.5}) are not currently exceeded at the Lucan air quality monitoring station.

7.3.4 Air Quality Impact Predictions due to Traffic Emissions

The DMRB Screening Assessment is based on assessing existing and predicted traffic flows for the surrounding road network supplied in the Traffic and Transport Assessment prepared by Egis.

AM and PM peak hour traffic flows have been provided in the Traffic and Transport Assessment. To assess realistic worst-case AADT flows in the DMRB Screening Assessment the largest of

either the AM and PM peak hour flows has been multiplied by 12. For all the surrounding road network, it was determined that the PM peak hour traffic flow value was higher than the AM peak hour traffic flow value.

The traffic flow values on the surrounding road network for the base year 2023, the proposed year of opening 2027 and the design year, 2042 do nothing and do something scenarios are shown in Figure 7-3A to 7-3C below, as extracted from the Traffic and Transport Assessment (Ref.; Figures 17 - 22).

Junction 1 and Junction 7 are the junctions that have been assessed in the DMRB assessment. Junction 1 is the Western Access Road to St. Edmundsbury Hospital / Lucan Road junction and Junction 7 is the Chapel Hill / Lucan Road junction. The AADT data input into the DMRB model is summarised in Table 7-5.

Considering the location of some of the sensitive receivers being close to a busy junction, the following assumption can be made;

- For a busy junction, assume that traffic approaching the junction slows to an average of 20kph. These should allow for a junction, which potentially suffers from a lot of congestion and stopping traffic. In general, these speeds are relevant for approach distances of approximately 25m;
- For other junctions (non-motorway) and roundabouts where some slowing of traffic occurs, assume that the speed is 10kph slower than the average free flowing speed.

[From Part IV of the Environment Act 1995 Environment (Northern Ireland) Order 2002 Part III Local Air Quality Management Technical Guidance (TG22) March 2022]

Further modelling information with regards to the road speeds used within the assessment are detailed in Table 7-5.



Figure 7-3A: Traffic flows on the surrounding road network – Baseline Year 2023-Evening Peak Hour



Figure 7-3B: Traffic flows on the surrounding road network – Year of opening 2027 Do Nothing and Do Something scenarios



Figure 7-3C: Traffic flows on the surrounding road network – Design Year 2042 Do Nothing and Do Something scenarios.

Table 7-5: Traffic flows on the surrounding road network for 2023 base year, Year of Opening 2027 and Design Year 2042 Do Nothing & Do Something scenarios and Speed (km/hr) as inputted into DMRB Model

Road Name	2023 Base Year	2027 – Do Nothing	2027 – Do Something	2042 – Do Nothing	2042 – Do Something	Modelled Speed (km/hr)
@Junction 1 – Western Access Road to St. Edmundsbury Hospital / Lucan Road	300	324	1,824	360	1860	40
@Junction 1 – Lucan Road West	16,848	18,000	18,912	20,160	21,072	50
@Junction 1 – Lucan Road East	16,788	17,940	18,576	20,088	20,724	50
@Junction 7 – Chapel Hill	10,668	11,388	11,928	12,732	13,272	20
@Junction 7 – Lucan Road	16,860	18,000	18,900	20,148	21,048	20

The EPUK & IAQM Land-Use Planning & Development Control: Planning For Air Quality (2017) outlines indicative criteria for requiring an air quality assessment, as shown in Table 7-6.

Table 7-6: Extract from EPUK & IAQM Land Use Planning & Development Control, Planning for Air Quality (2107), and indicative criteria for requiring an air quality assessment

The development will:	Indicative Criteria to Proceed to an Air Quality Assessment
1. Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors. (LDV = cars and small vans 3.5t gross vehicle weight).	A change of LDV flows of: - more than 100 AADT within or adjacent to an AQMA - more than 500 AADT elsewhere.
2. Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors. (HDV = goods vehicles + buses >3.5t gross vehicle weight).	A change of HDV flows of: - more than 25 AADT within or adjacent to an AQMA - more than 100 AADT elsewhere.

The EPUK & IAQM Land-Use Planning & Development Control: Planning for Air Quality (2017) indicative criteria suggests a traffic emissions impact assessment is required for this project. Therefore, a DMRB Screening Method has been undertaken to predict the change in pollutant concentrations due to traffic emissions at the nearest representative residential receptors in the baseline year (2023) in the year of opening 2027 and in the design year (2042) without & with the proposed development, as outlined in Table 7-7Table 7-8Table 7-9. These predictions are based on the Annual Average Daily Traffic flow in proximity to the proposed development as quoted in Table 7-6.

The annual mean PM10 concentration of 12.04 µg/m³ as recorded at the EPA monitoring station in Lucan (between 01/01/2025 – 31/12/2025) has been inputted into the DMRB model to predict the PM10 concentration at the receptor locations. The predicted NO₂ and PM10 concentrations at the modelled receptor locations are presented in Table 7-8.

Table 7-7: DMRB Screening Method predicted NO₂ and PM₁₀ concentrations at the modelled receptor locations (µg/m³) in the baseline year 2023

Location	DMRB Predicted Annual Mean NO _x (µg/m ³) at façade	DMRB Predicted Annual Mean PM ₁₀ (µg/m ³) at façade
@ R1	13.79 µg/m ³	13.85 µg/m ³
@ R2	7.28 µg/m ³	13.00 µg/m ³
@ R3	5.00 µg/m ³	12.70 µg/m ³
@ R4	10.32 µg/m ³	13.40 µg/m ³

Table 7-8: DMRB Screening Method predicted NO₂ and PM₁₀ concentrations at the modelled receptor locations (µg/m³) in Year of Opening 2027, Without & With Development

Location & Scenario	DMRB Predicted Annual Mean NO _x (µg/m ³) at façade	DMRB Predicted Annual Mean PM ₁₀ (µg/m ³) at façade
@ R1 – Without Dev.	14.24 µg/m ³	13.93 µg/m ³
@ R1 – With Dev.	14.68 µg/m ³	13.99 µg/m ³
@ R2 – Without Dev.	7.45 µg/m ³	13.03 µg/m ³
@ R2 – With Dev.	7.89 µg/m ³	13.09 µg/m ³
@ R3 – Without Dev.	5.12 µg/m ³	12.72 µg/m ³
@ R3 – With Dev.	5.41 µg/m ³	12.76 µg/m ³
@ R4 – Without Dev.	10.82 µg/m ³	13.47 µg/m ³
@ R4 – With Dev.	11.23 µg/m ³	13.53 µg/m ³

Table 7-9: DMRB Screening Method predicted NO₂ and PM₁₀ concentrations at the modelled receptor locations (µg/m³) in the Design Year 2042, Without & With Development

Location & Scenario	DMRB Predicted Annual Mean NO _x (µg/m ³) at façade	DMRB Predicted Annual Mean PM ₁₀ (µg/m ³) at façade
@ R1 – Without Dev.	15.14 µg/m ³	14.05 µg/m ³
@ R1 – With Dev.	15.57 µg/m ³	14.10 µg/m ³
@ R2 – Without Dev.	7.80 µg/m ³	13.07 µg/m ³
@ R2 – With Dev.	8.23 µg/m ³	13.13 µg/m ³
@ R3 – Without Dev.	5.36 µg/m ³	12.75 µg/m ³
@ R3 – With Dev.	5.65 µg/m ³	12.79 µg/m ³
@ R4 – Without Dev.	11.82 µg/m ³	13.61 µg/m ³
@ R4 – With Dev.	10.82 µg/m ³	13.51 µg/m ³

Using the DEFRA NO_x to NO₂ calculator, the DMRB Screening Method predicted NO_x concentrations have been used to predict the NO₂ concentrations at the receptor locations at the façade of the proposed development. 2025 annual mean NO_x and NO₂ background concentrations of 4.54 µg/m³ and 3.56 µg/m³ respectively have been used in the NO_x to NO₂ calculator to predict the NO₂ concentration at the receptor locations. The predicted NO₂ and PM₁₀ concentrations at the receptor locations in the Year of Opening and in the Future Year are presented in Table 7-10A and 7-10B.

Table 7-10A: Predicted Nitrogen Dioxide (NO₂) and Particulate (PM₁₀) concentrations at receptor locations in the 'Year of Opening' Without & With Development

Location & Scenario	Annual Mean NO ₂ (µg/m ³)	Annual Mean PM ₁₀ (µg/m ³)
@ R1 – Without Dev.	28.05 µg/m ³	13.93 µg/m ³
@ R1 – With Dev.	28.26 µg/m ³	13.99 µg/m ³
@ R2 – Without Dev.	24.66 µg/m ³	13.03 µg/m ³
@ R2 – With Dev.	24.88 µg/m ³	13.09 µg/m ³
@ R3 – Without Dev.	23.47 µg/m ³	12.72 µg/m ³
@ R3 – With Dev.	23.62 µg/m ³	12.76 µg/m ³
@ R4 – Without Dev.	26.35 µg/m ³	13.47 µg/m ³
@ R4 – With Dev.	26.56 µg/m ³	13.53 µg/m ³
LIMIT VALUE	40 µg/m ³	40 µg/m ³

Table 7-10B: Predicted Nitrogen Dioxide (NO₂) and Particulate (PM₁₀) concentrations at receptor locations in the Design Year 2042, Without & With Development

Location & Scenario	Annual Mean NO ₂ (µg/m ³)	Annual Mean PM ₁₀ (µg/m ³)
@ R1 – Without Dev.	28.39 µg/m ³	14.05 µg/m ³
@ R1 – With Dev.	28.6 µg/m ³	14.10 µg/m ³
@ R2 – Without Dev.	24.78 µg/m ³	13.07 µg/m ³
@ R2 – With Dev.	25.0 µg/m ³	13.13 µg/m ³
@ R3 – Without Dev.	23.56 µg/m ³	12.75 µg/m ³
@ R3 – With Dev.	23.7 µg/m ³	12.79 µg/m ³
@ R4 – Without Dev.	26.77 µg/m ³	13.61 µg/m ³
@ R4 – With Dev.	26.28 µg/m ³	13.51 µg/m ³
LIMIT VALUE	40 µg/m ³	40 µg/m ³

The predicted NO₂ and PM₁₀ concentrations have been compared with the relevant Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011) (See Table 1). The results of the DMRB Screening Method and subsequent Air Quality Impact Assessment for NO₂ and PM₁₀ indicate that there will not be an exceedance of the relevant Air Quality Limit Values for NO₂ and PM₁₀ at the proposed development.

Tables 7-11A and 7-11B summarise the description of magnitude of impact on NO₂ and PM₁₀ concentrations at the receptor locations, in accordance with the rationale for describing the impact of the proposal derived from the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) guidance (EPUK & IAQM) Land-Use Planning & Development Control: Planning for Air Quality (January 2017).

Table 7-11A: Description of magnitude of impact in terms of NO₂ and PM₁₀ concentrations at the receptor location in 2027

Receptor	Absolute Change in 2027	Relative Change (% of AQAL)	Percentage of predicted concentration relative to AQAL	Predicted Impact
NO ₂ @ R1 – With Dev.	0.21	0.53%	70.65%	Negligible Impact
PM ₁₀ @ R1 – With Dev.	0.06	0.15%	34.98%	Negligible Impact
NO ₂ @ R2 – With Dev.	0.22	0.55%	62.20%	Negligible Impact
PM ₁₀ @ R2 – With Dev.	0.06	0.15%	32.73%	Negligible Impact
NO ₂ @ R3 – With Dev.	0.15	0.38	59.05	Negligible Impact
PM ₁₀ @ R3 – With Dev.	0.04	0.10	31.90	Negligible Impact
NO ₂ @ R4 – With Dev.	0.21	0.52	66.40	Negligible Impact
PM ₁₀ @ R4 – With Dev.	0.06	0.15	33.83	Negligible Impact

Table 7-11B: Description of magnitude of impact in terms of NO₂ and PM₁₀ concentrations at the receptor location in 2042

Receptor	Absolute Change in 2042	Relative Change (% of AQAL)	Percentage of predicted concentration relative to AQAL	Predicted Impact
NO ₂ @ R1 – With Dev.	0.21	0.53%	71.50%	Negligible Impact
PM ₁₀ @ R1 – With Dev.	0.05	0.12%	35.25%	Negligible Impact
NO ₂ @ R2 – With Dev.	0.22	0.55%	62.50%	Negligible Impact
PM ₁₀ @ R2 – With Dev.	0.06	0.15%	32.83%	Negligible Impact
NO ₂ @ R3 – With Dev.	0.14	0.35%	59.25%	Negligible Impact
PM ₁₀ @ R3 – With Dev.	0.04	0.10%	31.98%	Negligible Impact
NO ₂ @ R4 – With Dev.	-0.49	-1.23%	65.70%	Negligible Impact
PM ₁₀ @ R4 – With Dev.	-0.10	-0.25%	33.78%	Negligible Impact

As outlined in Section 7 Assessing Significance of the EPUK/IAQM guidance document a judgment of significance should be made by a competent professional. The results of the DMRB Screening Method and subsequent Air Quality Impact Assessment indicate that there will be a negligible impact on the air quality in the vicinity of the development due to associated traffic flows. Existing residents in the area will not experience a significant air quality impact. A detailed atmospheric dispersion model of traffic emissions is not required based on the existing air quality and the future predicted traffic flows in the area of the development.

In terms of annual mean NO₂ and PM₁₀ concentrations from associated road traffic emissions, as impact descriptors for individual receptors, there will be a negligible impact on NO₂ due to the Process Contribution (PC) from the proposed hospital project. The long-term average concentration at receptors will be less than 75% of the relevant Air Quality Assessment Level (AQAL) and the percentage change in concentration will be <1% of the AQAL.

7.3.4.1 Impacts On Sensitive Ecosystems

A portion of the proposed development site is within an area designated as the Liffey Valley pNHA (000128) as shown in Figure 7-4 below.



Figure 7-4: Liffey Valley pNHA in relation to the Proposed Development

The Liffey Valley pNHA is situated along the River Liffey between Leixlip Bridge on the Kildare-Dublin border and downstream of the weir at Glenaulin, Palmerstown, Co. Dublin. The site is important because of the diversity of aquatic to terrestrial habitats within the site. A number of rare and threatened plant species have been recorded in the site. The main terrestrial habitat included within the site is mixed deciduous woodland. It is terrestrial woodland that is found in proximity to the development site.

In line with TII and DMRB guidance, consideration of air quality impacts should be given to ecological habitats with a national or international designation that are located within 200m from the roads assessed within the study area and where a significant change in AADT flows (>5%) will occur.

Nitrogen oxides concentrations and nitrogen deposition rates are calculated within the designated site, in a transect up to 200m away from the road carriageway using the DMRB screening model. The results are then compared with the NOx standard for the protection of vegetation of 30 µg/m³ and the incremental change due to the proposed scheme options identified.

Where the proposed development is expected to cause an increase in concentrations of more than 2 µg/m³ and the predicted concentrations (including the background) are close to (within 10% of), or exceed the standard, then the sensitivity of the habitat to NOx should be assessed by the project Ecologist.

The impact of the proposed development has been assessed for the sensitive receptor R4 – the Canon Despard Centre / The Village Montessori Preschool, which is located within the Liffey Valley pNHA. The predicted impact has been found to be negligible at the sensitive receptor R4.

Therefore, it is considered there will a negligible impact on Liffey Valley pNHA as a result of the proposed development and further detailed assessment is not required.

7.3.5 Construction Dust Impact Assessment

The Dust Impact Assessment has been undertaken in accordance with Guidance on the Assessment of Dust from Demolition and Construction (IAQM) August 2023 (Version 2.1) to predict the risk of dust impacts and the level of mitigation that is required to control the residual effects to a level that is “not significant”.

The proposed development will consist of:

- Demolition of existing modern extension to St Edmundsbury House, currently in use as a 52-bed adult facility;
- Construction of new 14-bed adolescent facility on the site of the modern extension to St Edmundsbury House, consisting of:
 - o Secure Adolescent Care Unit, catering for a wide range of psychiatric treatment programs for both in-patient and day service users comparable to Main Hospital, with dedicated gymnasium.
- Construction of new 200-bed in-patient adult facility to the south of the existing woodland consisting of:
 - o Specialist Age Care Unit, High Dependency Unit, Eating Disorder Unit, Higher Acuity General Psychiatric Unit, Occupational Therapy Hub.
 - o Hospital Admissions, Education and Training, Restaurant, Shop, Hairdresser, Multi Faith, Library, Pharmacy,
 - o Housekeeping, Kitchen and Facilities Management.
 - o 3 no. General Psychiatric Unit, Hospital SMT.
- Soft landscaping including:
 - o Public Open Space maintaining the existing walking loop and access to the future Liffey Valley Park.
 - o Open garden (green lunges connecting the new hospital and the existing buildings, accessible by service users and staff only),
 - o Private gardens (secure garden directly accessible from the new hospital by service users and staff only),
 - o Private Courtyards (secure private green spaces within the ward areas)
 - o Green roofs on the new facility.
- Reconfigured and additional new car and cycle parking facilities with revised total of 214 no. car parking spaces, 2 no. bus parking spaces and 160 no. secure cycle parking spaces;
- Retention, refurbishment and repurposing of existing historic farm buildings into Individual Therapy Consultation Suites, a Public Café, and Hospital Facilities Buildings;
- Hard landscaping including all footpaths, internal roadways, courtyards, and boundary treatments;
- Continued use of St Edmundsbury House for Adult Daycare/Group and Individual Therapy sessions in addition to associated consultant, administration and support facilities.
- Refurbishment of existing kitchen facilities serving both Adolescent Unit and Staff.
- Removal of contemporary interfaces at St Edmundsbury House, and repair/reinstatement of historic façade.
- All ancillary features.

Activities on construction sites have been divided into four types to reflect their

- Demolition;
- Earthworks;
- Construction; and
- Trackout.

The potential for dust emissions is assessed for each activity that is likely to take place. Obviously, if an activity is not taking place, e.g. demolition, then it does not need to be assessed. The risk assessment categories assume that the most basic project controls are applied to every project.

The assessment methodology considers three separate dust impacts:

- Annoyance due to dust soiling;
- The risk of health effects due to an increase in exposure to PM10; and
- Harm to ecological receptors with account being taken of the sensitivity of the area that may experience these effects. The assessment is used to define appropriate mitigation measures to ensure that there will be no significant effect.

The assessment steps are:

STEP 1: Screening the Need for a Detailed Assessment

An assessment will normally be required where there is:

- a 'human receptor' within:
 - 350 m of the boundary of the site; or
 - 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s)
- an 'ecological receptor' within:
 - 50 m of the boundary of the site; or
 - 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s)

STEP 2: Assess the Risk of Dust Impacts

The risk of dust arising in sufficient quantities to cause annoyance and/or health and/or ecological impacts should be determined using four risk categories: negligible, low, medium and high risk. A site is allocated to a risk category based on two factors:

- the scale and nature of the works, which determines the potential dust emission magnitude as small, medium or large (STEP 2A); and
- the sensitivity of the area to dust impacts (STEP 2B), which is defined as low, medium or high sensitivity.

These two factors are combined in STEP 2C to determine the risk of dust impacts with no mitigation applied. The risk category assigned to the site can be different for each of the four potential activities (demolition, earthworks, construction and trackout). More than one of these activities may occur on a site at any one time. Where appropriate, the site can be divided into 'zones' for the dust risk assessment.

Step 2A: Define the Potential Dust Emission Magnitude

Earthworks, construction and trackout will occur during the construction phase. Table 7-12 describes the potential dust emission class criteria for each outlined construction activity.

Table 7-12: Criteria Used in the Determination of Dust Emission Class

Activity	Criteria used to Determine Dust Emission Class		
	Small	Medium	Large
Demolition	Total building volume <12,000 m ³ Construction material with low potential for dust release (e.g. metal cladding or timber) Demolition activities <6 m above ground level Demolition during wetter months	Total building volume 12,000 m ³ - 75,000m ³ Potentially dusty construction material. Demolition activities 6-12 m above ground level	Total building volume >75,000m ³ Potentially dusty construction material (e.g. concrete) On-site crushing and screening, Demolition activities >12 m above ground level
Earthworks	Total site area <18,000m ² soil type with large grain size (e.g. sand), <5 heavy moving earth vehicles active at any one time formation of bunds <4 m in height	Total site area 18,000 – 110,000m ² Moderately dusty soil type (e.g. silt) 5-10 heavy moving earth moving vehicles active at any one time. formation of bunds 3m - 6m in height,	Total site area >110,000m ² potentially dusty soil type (e.g. clay) >10 heavy earth moving vehicles active at any one time. formation of bunds >6 m in height
Construction	Total building volume <12,000m ³ Construction material with low potential for dust release	Total building volume 12,000 – 75,000m ³ Potentially dusty construction material (e.g. concrete) On-site concrete batching	Total building volume >75,000m ³ On-site concrete batching Sandblasting
Trackout	<20 outward HDV trips in any one day surface material with low potential for dust release, Unpaved road length <50m	20 - 50 outward HDV trips in any one day moderately dusty surface material (e.g. high clay content), Unpaved road length 50-100m	>50 outward HDV trips in any one day potentially dusty surface material (e.g. high clay content) Unpaved road length >100m

The potential dust emission magnitudes for the proposed development were estimated and determined using the criteria detailed in Table 7-12 as follows;

7.3.5.1 Demolition:

Demolition includes any activity involved with the removal of an existing structure (or structures). Demolition involved with the proposed development includes the demolition of existing modern extension to St Edmundsbury House.

- Total building volume <12,000 m³
- Potentially dusty construction material
- Demolition activities 6-12m above ground level
- Therefore, the dust emission magnitude for Demolition is defined as Medium.

7.3.5.2 Earthworks:

Earthworks covers the processes of soil-stripping, ground-levelling, excavation, and landscaping.

- Total site area is 18,000-110,000 m² (79,030 m²)
- Moderately dusty soil type
- 5-10 heavy moving earth vehicles at any one time

- Therefore, the dust emission magnitude for Earthworks is defined as Medium.

7.3.5.3 Construction:

Construction covers any activity involved with the provision of a new structure (or structures), its modification or refurbishment. Construction involved with the proposed development includes construction of a new adolescent facility, a new in-patient adult facility, ground level car parking and refurbishment of existing historic farm buildings and St Edmundsbury House all ancillary works

- Total building volume >75,000m³
- Potentially dusty construction material (e.g. concrete).
- On site concrete batching
- Therefore, the dust emission magnitude for Construction is defined as Large.

7.3.5.4 Trackout:

Trackout covers the transport of dust and dirt from the construction site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when heavy duty vehicles (HDVs) leave the construction/demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site.

- 20-50 outward HDV trips in any one day.
- Potentially dusty surface material (e.g. high clay content)
- Unpaved road length >100m
- Therefore, the dust emission magnitude for Trackout is defined as Large

Step 2B: Define the Sensitivity of the Area

- The sensitivity of the area takes account of a number of factors:
- the specific sensitivities of receptors in the area;
- the proximity and number of those receptors;
- in the case of PM₁₀, the local background concentration; and
- site-specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

The criteria for determining the sensitivity of receptors for dust soiling effects and health effects of PM₁₀ is detailed in Table 7-13.

Table 7-13: Criteria for Determining Sensitivity of Receivers

Sensitivity of Receiver	Criteria for Determining Sensitivity	
	Dust Soiling Effects	Health Effects of PM ₁₀
High	Dwellings, museums and other culturally important collections, medium and long-term car parks and car showrooms	Residential properties, hospitals, schools and residential care homes
Medium	Parks, places of work	Office and shop workers not occupationally exposed to PM ₁₀
Low	Playing fields, farmland, footpaths, short-term car parks and roads	Public footpaths, playing fields, parks and shopping streets

The criteria detailed in Table 7-14 and Table 7-15 were used to determine the sensitivity of the area to dust soiling effects and human health impacts

Table 7-14: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receiver Sensitivity	Number of Receivers	Distance from Source (m)			
		<20m	<50m	<100m	<350m
High	>100	High	High	Low	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table 7-15: Sensitivity of the Area to Human Health Impacts

Receiver Sensitivity	Annual Mean PM10 Conc	Number of Receivers	Distance from Source (m)				
			<20m	<50m	<100m	<200m	<350m
High	>32 µg/m3	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32 µg/m3	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28 µg/m3	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32 µg/m3	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32 µg/m3	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28 µg/m3	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24 µg/m3	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	-	≥1	Low	Low	Low	Low	Low
		≥1	Low	Low	Low	Low	Low

Table 7-16: Sensitivity of the Area to Ecological Impacts

Receiver Sensitivity	Distance from Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

7.4 Sensitivity of Receivers

Table 7-17 outlines the range of numbers of properties within specific distance bands from the proposed construction activities to determine the receptor sensitivity of the area to Dust Soiling Effects on People and Property.

Table 7-17: Cumulative number of sensitive receivers within 20m, 50m, 100m, 200m and 350m of the site

Parameter	Number of Receivers within Distance from Site (m)				
	<20m	<50m	<100m	<200m	<350m
No. of receivers in proximity to Site	21	27	~37	<100	>100
Receiver Sensitivity	High	Medium	Low	Low	Low

7.4.1 Sensitivity of People to Dust Soiling

Demolition, Earthworks and Construction: There are two sensitive receptors within 20m of the proposed construction activities on the site, including the Canon Despardo Centre / The Village Montessori Preschool on Chapel Hill and the residential property on Lucan Road known Hillhouse. Hillhouse received planning permission in January 2021 for demolition of the existing house and construction of a one 4 storey building accommodating 20 apartments. Therefore, there are 21 sensitive receptors <20m from the proposed construction works. There are an additional 6 sensitive receptors within 50m of the site including St Andrews National School. There are approximately 10 additional sensitive receptors <100m from the proposed construction works including, St Marys Church and the adjacent Presentation Sisters Convent. Therefore, the sensitivity of the Area to Dust Soiling Effects on People and Property is High; in terms of potential demolition, earthworks and construction dust impacts.

Trackout: As general guidance, without site-specific mitigation, trackout may occur from roads up to 500 m from large sites (as determined in Step 2A). The impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50 m from the edge of the road. As shown in Table 7-17, there are 27 sensitive receptors within 50 m of the site, therefore the table indicates the sensitivity of the area is Medium; in terms of potential trackout dust impacts.

7.4.2 Sensitivity of the Area to Human Health Impacts

The numbers are estimated. In accordance with IAQM guidance; in the case of high sensitivity receptors with high occupancy (such as schools or hospitals) the number of people likely to be present are approximated. In the case of residential dwellings, the number of properties is included. The Canon Despardo Centre / The Village Montessori Preschool on Chapel Hill is located <20m from the proposed site.

There is approximately one other sensitive receptor <20m namely Hillhouse which as stated above comprises 20 apartments. The Village Montessori preschool is registered in January 2023 of accommodating 88 children. Therefore, there are 108 high sensitivity receptors considered <20m from the proposed development.

Section 3 outlines baseline air quality in the study area The PM10 concentration recorded at the EPA monitoring station in Lucan (Grid Ref: 53.3491°N, -6.4503°E), approximately 1.45km southwest of the proposed development, have been referenced for the period January 2023 to date (11th October 2023) as 12.04µg/m³. As shown in Table 7-15, the sensitivity of the Area to Human Health Impacts is Medium; in terms of potential demolition, earthworks, construction and trackout dust impacts.

7.4.3 Sensitivity of the Area to Ecological Impacts

Dust deposition due to demolition, earthworks, construction and trackout has the potential to affect sensitive habitats and plant communities.

A portion of the development site is designated as the Liffey Valley pNHA (000128) as shown in Figure 7-4 above.

Works are not proposed to take place within the designation boundary but will occur in close proximity (<20m). Table 7-18 outlines Sensitivity of the Area to Ecological Impacts. A high receiver sensitivity is those receivers with an international or national designation, therefore, the sensitivity of the Area to Ecological Impacts is High; in terms of potential demolition, earthworks, construction and track out dust impacts.

The sensitivity of the area to dust soiling, human health impacts and ecological impacts for each activity is summarised in Table 7-18.

Table 7-18: Outcome of Defining the Sensitivity of the Area

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	High	High	Medium
Human Health	Medium	Medium	Medium	Medium
Ecological Impacts	High	High	High	High

Step 2C: Define the Risk of Impacts

In accordance with the IAQM Guidance, the dust emission magnitude (Step 2A) and sensitivity of the area (Step 2B (Table 12-8)) have been combined and the risk of impacts from demolition, construction, earthworks and trackout determined (before mitigation is applied).

Reminder of Step 2A : Potential Dust Emission Magnitude:

- Demolition: Medium
- Earthworks: Medium
- Construction: Large
- Trackout: Large

The risk of dust soiling, impact on human health and ecological impact before mitigation, is summarised in Table 7-19.

Table 7-19: Summary Dust Risk to Define Site-specific Mitigation

Potential Impact	Dust Emission Magnitude			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium Risk	Medium Risk	High Risk	Medium Risk
Human Health	Medium Risk	Medium Risk	Medium Risk	Medium Risk
Ecological Impacts	Medium Risk	Medium Risk	High Risk	High Risk

Step 3: Site-Specific Mitigation

In accordance with the IAQM Guidance, for proposed mitigation measures, the highest risk category should be applied. Therefore, the mitigation measures applicable to a High Risk site should be applied as outlined in Section 7.5.

7.5 Mitigation Measures

7.5.1 Construction Phase Mitigation Measures

A detailed construction phase dust impact assessment has been undertaken which is presented in Appendix B. Appropriate construction dust mitigation measures have been outlined for a to a High Risk site. These are:

7.5.1.1 General Measures

Communications

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
- Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
- Display the head or regional office contact information
- Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The DMP may include monitoring of dust deposition, dust flux, real-time PM10 continuous monitoring and/or visual inspections.

7.5.1.2 Site Management

- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
- Make the complaints log available to the local authority when asked.
- Record any exceptional incidents that cause dust and/or air emissions, either on or offsite, and the action taken to resolve the situation in the logbook.
- Hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/ deliveries which might be using the same strategic road network routes.

7.5.1.3 Monitoring

- Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary.
- Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions
- Agree dust deposition, dust flux, or real-time PM10 continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.

7.5.1.4 Preparing and maintaining the site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below
- Cover, seed or fence stockpiles to prevent wind whipping.

7.5.1.5 Operating vehicle/machinery and sustainable travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable
- Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)

7.5.1.6 Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate
- Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods

7.5.1.7 Waste Management

- Avoid bonfires and burning of waste materials.

The IAQM Guidance Mitigation Measures applicable to the specific works undertaken are as follows:

7.5.1.8 Measures specific to demolition

- Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).
- Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
- Avoid explosive blasting, using appropriate manual or mechanical alternatives.
- Bag and remove any biological debris or damp down such material before demolition.

7.5.1.9 Measures specific to earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable
- Only remove the cover in small areas during work and not all at once

7.5.1.10 Measures specific to construction

- Avoid scabbling (roughening of concrete surfaces) if possible
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.

7.5.1.11 Measures specific to trackout

- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.

- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site logbook.
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Access gates to be located at least 10 m from receptors where possible.

7.5.2 Operation Phase Mitigation Measures

There is no requirement for mitigation measures relating to the operational phase. The development has been shown to be **Permanent, Not significant, Neutral** in terms of air quality. Future proposed engine improvements and a transition to electric vehicles will result in continued improvement in urban air quality into the future.

In terms of space heating, the proposal is expected to utilise electric heating for both hot water (hot water cylinder with an immersion) and space heating. Therefore, there will be no pollutant emissions to atmosphere from oil or gas boiler heating sources.

7.6 Residual Impacts

7.6.1 Construction stage

Construction site dust control measures and good construction site management and practice is capable of effectively mitigating the potential for significant impact of fugitive dust emissions. Therefore, the potential for fugitive dust emission effects at the nearest residential properties and ecological receptors will be controlled to ensure impacts are of negligible significance.

The IAQM Guidance recommends that significance is only assigned to the effect after considering the construction activity with mitigation. Therefore, the detailed mitigation measures have been defined in a form suitable for implementation by way of inclusion within the EIAR which makes up part of the planning consent.

Using the IAQM methodology for the assessment of impacts from construction activities, the following is indicated in Table 7-20;

- the risk of dust soiling impacts are medium risk for demolition, earthworks and trackout and are high risk for construction;
- the impacts on human health are medium risk for demolition, earthworks, construction and trackout; and
- the ecological impacts are medium risk for demolition and earthworks, and are high risk for construction and trackout;

In accordance with the IAQM Guidance, the highest risk category measures have been applied in the determination of appropriate mitigation measures. The significance of impacts arising from the risks identified together with the proposed mitigation measures are summarised in Table 7-20.

Together with the proposed mitigation measures and the existing low background particulate (PM10) concentrations, the construction phase activities on the proposed site will not cause an exceedance of the air quality objectives at receptor locations.

Table 7-20: Summary of Significance of Impact Including Site Specific Mitigation

Potential Impact	Dust Emission Magnitude			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Negligible	Negligible	Negligible	Negligible
Human Health	Negligible	Negligible	Negligible	Negligible
Ecological Impacts	Negligible	Negligible	Negligible	Negligible

7.6.2 Operational phase

An assessment of the potential air quality impact due to traffic emissions as a result of the proposed development on the future residents has been undertaken using the DMRB Screening Method. The results of the DMRB Screening Method and subsequent Air Quality Impact Assessment indicate that there will be a negligible impact on air quality as a result of the proposed development in the vicinity of the site and there will be no significant air quality impact on nearby residents or on the ecological designated site; Liffey Valley pNHA.

There are no operational phase mitigation measures proposed as all predicted pollutant levels in proximity to the proposed development site are and will be below the National Ambient Air Quality limit values for Nitrogen Dioxide & Particulate Matter (PM10). The residual effect is **Permanent, Not Significant, Neutral**.

An assessment of the Significance of Impact of the air quality impacts arising from the proposed healthcare development has been carried out following recommended methodologies for the determination of significance of impact arising from the emissions associated with the operation of the proposed healthcare development at St Edmundsbury Hospital. The findings of this assessment are detailed in the assessment above and summarised below.

Table 7-21: Assessment of the Significance of Impact of the air quality impacts arising from the proposed healthcare development at St Edmundsbury Hospital, Lucan

Receptor	Sensitivity	Description of Impact	Magnitude of Cumulative Impacts	Probability	Significance of Effects	Significant - Yes/No?
Human Health	High	Operational emissions from proposed healthcare development to atmosphere at human receptor locations	In terms of annual mean pollutant concentrations, there will be a negligible change due to the Process Contribution.	High	Negligible	No

7.7 Interactions

Biodiversity

Earthworks during the construction phase have the potential to give rise to dust impacts, potentially giving rise to impacts on flora and fauna. The mitigation measures that will be put in place at the proposed development site will ensure that the impact of the proposed development complies with environmental legislation and therefore during the construction phase, the predicted impact through interaction would be **Temporary, Imperceptible, Not Significant**. In terms of the operational phase, the predicted impact through interaction would be **Long-term, Imperceptible, Neutral**.

Population and Human Health

An adverse air quality impact in either the construction or operational phase has the potential to cause health and dust nuisance issues. The mitigation measures that will be put in place at the

proposed development site will ensure that the impact of the proposed development complies with all ambient air quality legislative limits and therefore the predicted impact would be **Short-term, Adverse, Not Significant** with respect to the construction phase. In terms of the operation phase, the predicted impact would be **Long-term, Imperceptible, Neutral** with respect to the operational phase in terms of human health impacts. The development has been shown to be not significant in terms of air quality.

Material Assets

Interactions between air quality and traffic can be significant. With increased traffic movements and reduced engine efficiency due to traffic congestion, the emissions from vehicles may increase. The impacts of the proposed development on air quality have been assessed by reviewing the change in annual average daily traffic flows on roads close to the site. In this assessment, the impact of the interactions between traffic and air quality are considered to be **Short-term, Adverse, Not Significant**. During operation, the predicted impacts would be **Long-term, Imperceptible, Not Significant**.

Mitigation of combined effects is best achieved through management and control measures to prevent the individual impacts in the first instance or reduce the impacts and therefore reduce the likelihood of such interactions occurring.

With the appropriate mitigation measures to prevent fugitive dust emissions during construction, it is predicted that interactions between Air Quality with Biodiversity and Population and Human Health will be **Short-term, Imperceptible, Not Significant**.

All mitigation measures outlined in the respective chapters of this EIAR will be implemented in full to ensure the potential impact is minimised in relation to construction and operational impacts.

7.8 Potential Cumulative Effects

In relation to the cumulative impact of the proposed development, with other proposed developments planned in the area, the list of developments noted from Chapter 13 have been reviewed.

The construction phase of the proposed development, in combination with the construction phases of projects in the surrounding area could have the potential to negatively impact on air quality in the area due to cumulative construction phase air quality emissions.

In section 7.5 Mitigation Measures above it states:

- If applicable, hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/ deliveries which might be using the same strategic road network routes.

All proposed developments which could be considered as medium/high risk sites, are in excess of 500 metres away from the proposed development. Therefore, no projects in the area are predicted to result in cumulative impact in terms of air quality.

8 Noise and Vibration

8.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) assesses the noise and vibration impact of the proposed healthcare development within the grounds of the existing St Edmundsbury Hospital in Lucan, South Dublin.

The subject site located in Lucan, Co. Dublin comprises an overall site area of c. 8.10 ha. The site comprises the grounds and premises of the Saint Edmundsbury Hospital, and is bounded to the north by farmland, a school to the east, by the Lucan road to the south and by the River Liffey with its adjacent land and a pre-school to the west.

The Noise & Vibration Impact Assessment and evaluation of the impact of the proposed development have involved the following:

- Baseline Noise Survey – daytime and night-time noise monitoring in the vicinity of the proposed development site. The purpose of the daytime and night-time noise monitoring survey was to evaluate the existing noise climate in the area.
- Worst-case noise level predictions of the main likely noisy components of the construction phase of the proposed development at the nearest noise sensitive receivers.
- An assessment of the predicted construction noise and vibration impact on the nearest residential receivers and sensitive receivers versus relevant noise and vibration guidelines and a review of the potential for noise and vibration nuisance and complaint. Appropriate construction noise and vibration limits have been outlined.
- Noise impact assessment of the operational phase of the proposed development at the nearest noise sensitive receivers.
- An assessment of whether additional noise mitigation measures are required or not.

8.2 Assessment Methodology

8.2.1 Assessing Significance of Construction Noise Impacts

There are no national construction noise limit guidelines in the Republic of Ireland. Instead, there are indicative levels of acceptability for construction noise, such as contained in the Transport Infrastructure Ireland (TII) “Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes” (March 2014) as outlined in Table 8-1.

Table 8-1: Maximum permissible noise levels at the façade of dwellings during construction

Days & Times	LAeq dB	LAmax dB
Monday to Friday - 07.00 to 19.00	70	80*
Monday to Friday - 19.00 to 22.00	60*	65*
Saturday - 08.00 to 16.30	65	75
Sundays and Bank Holidays - 08.00 to 16.30	60*	65*

* Construction activity at these times, other than that required in respect of emergency works, will normally require the explicit permission of the relevant local authority. (Ref. TII Guidelines)

Annex E of BS5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise, provides guidance on assessing the potential significance of noise effects from construction activities. In relation to construction noise limits, BS 5228-1:2009+A1: 2014 Noise and Vibration Control on Construction and Open Sites Part 1: Noise details the ‘ABC method’, which recommends a construction noise limit based on the existing ambient noise level. General and short-term construction noise impacts that are deemed typical of any construction site noise sources, including activities such as ground preparation, site clearance, foundation earthworks, construction of new road alignment, etc. are assessed in accordance with the ‘ABC method’ defined in BS 5228.

For the area around the proposed development in proximity to the nearest noise sensitive receivers, the ambient noise levels have been determined through the baseline noise survey and then rounded to the nearest 5 dB to determine the appropriate category (A, B or C) and subsequent threshold value. A potentially significant effect is indicated if the construction noise level exceeds the appropriate category threshold value. If the existing ambient level exceeds the threshold category values, then a potential significant impact is indicated if the total noise level, including both the ambient noise and the various contributions of construction noise, is greater than the ambient noise level by more than 5 dB. Table 8-2, reproduced from BS5228, demonstrates the criteria for selection of a noise limit for a specific receiver location.

Table 8-2: Construction noise threshold levels based on the BS 5228 'ABC' method

Assessment Category and Threshold value period (LAeq)	Threshold value, in decibels (dB)		
	Category A (A)	Category B (B)	Category C (C)
Night time (23.00 to 07.00)	45	50	55
Evening and weekends (D)	55	60	65
Daytime (07.00 – 19.00) and Saturdays (07.00 - 13.00)	65	70	75

Notes:

Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

19.00–23.00 weekdays, 13.00–23.00 Saturdays and 07.00–23.00 Sundays.

8.2.2 Assessing Significance of Construction Vibration Impacts

The relevant guidelines for vibration limits are the following:

- British Standards Institution. British Standard 7385: Evaluation and measurement for vibration in buildings. Part 1: Guide for measurement of vibration and evaluation of their effects on buildings. 1990.
- British Standards Institution. British Standard 7385: Evaluation and measurement for vibration in buildings. Part 2: Guide for damage levels from ground borne vibration. 1993.
- British Standards Institution. British Standard 6472: Guide to evaluation of human exposure to vibration in buildings. Part 1: Vibration sources other than blasting. 2008.
- TII Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes, March 2014.

Relevant vibration limits and guidelines can be divided into two categories, those dealing with human comfort and those dealing with cosmetic or structural damage to buildings. Higher levels of vibration are typically tolerated for single events or events of short duration such as during construction projects compared to permanent vibration from operational industrial sources. For example, blasting (an instantaneous activity) and piling (a repetitive/continuous activity), two of the primary sources of vibration during construction projects, are typically tolerated at vibration levels up to 12mm/s and 2.5mm/s, respectively. The TII Guidelines (March 2014) identify limits for protection against cosmetic damage as a function of vibration frequency, and are:

- 8 mm/s (vibration frequency <10Hz)
- 12.5 mm/s (vibration frequency 10 to 50Hz)
- 20 mm/s (vibration frequency >50 Hz).

Guidance relevant to acceptable vibration at the foundation of buildings is contained within BS 7385 (1993): Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground-borne vibration. This guidance states that there should typically be no cosmetic

damage to buildings if transient vibration does not exceed 15mm/s at low frequencies rising to 20mm/s at 15Hz and 50mm/s at 40Hz and above. These guidelines refer to relatively modern buildings.

8.2.3 Relevant Operational Noise Guidelines & Standards

ProPG: Planning & Noise Professional Practice Guidance on Planning & Noise New Residential Development (May 2017)

The primary goal of the ProPG is to assist the delivery of sustainable development by promoting good health and wellbeing through the effective management of noise. It seeks to do that through encouraging a good acoustic design process in and around proposed new residential development having regard to national policy on planning and noise. The two sequential stages of the overall approach are:

- Stage 1 – an initial noise risk assessment of the proposed development site; and
- Stage 2 – a systematic consideration of four key elements.

Figure 8-1 summarises the Stage 1 Initial Site Noise Risk Assessment. The figure illustrates how an initial noise risk assessment is linked with an increasing risk of adverse effect from noise and how this in turn is broadly associated with indicative noise levels derived from current guidance and experience. The indicative noise levels are intended to provide a sense of the noise challenge at a potential residential development site and should be interpreted flexibly having regard to the locality, the project and the wider context. In the final column, the initial noise risk assessment is aligned with pre-planning application guidance that highlights the increasing importance of good acoustic design as the noise risk increases.

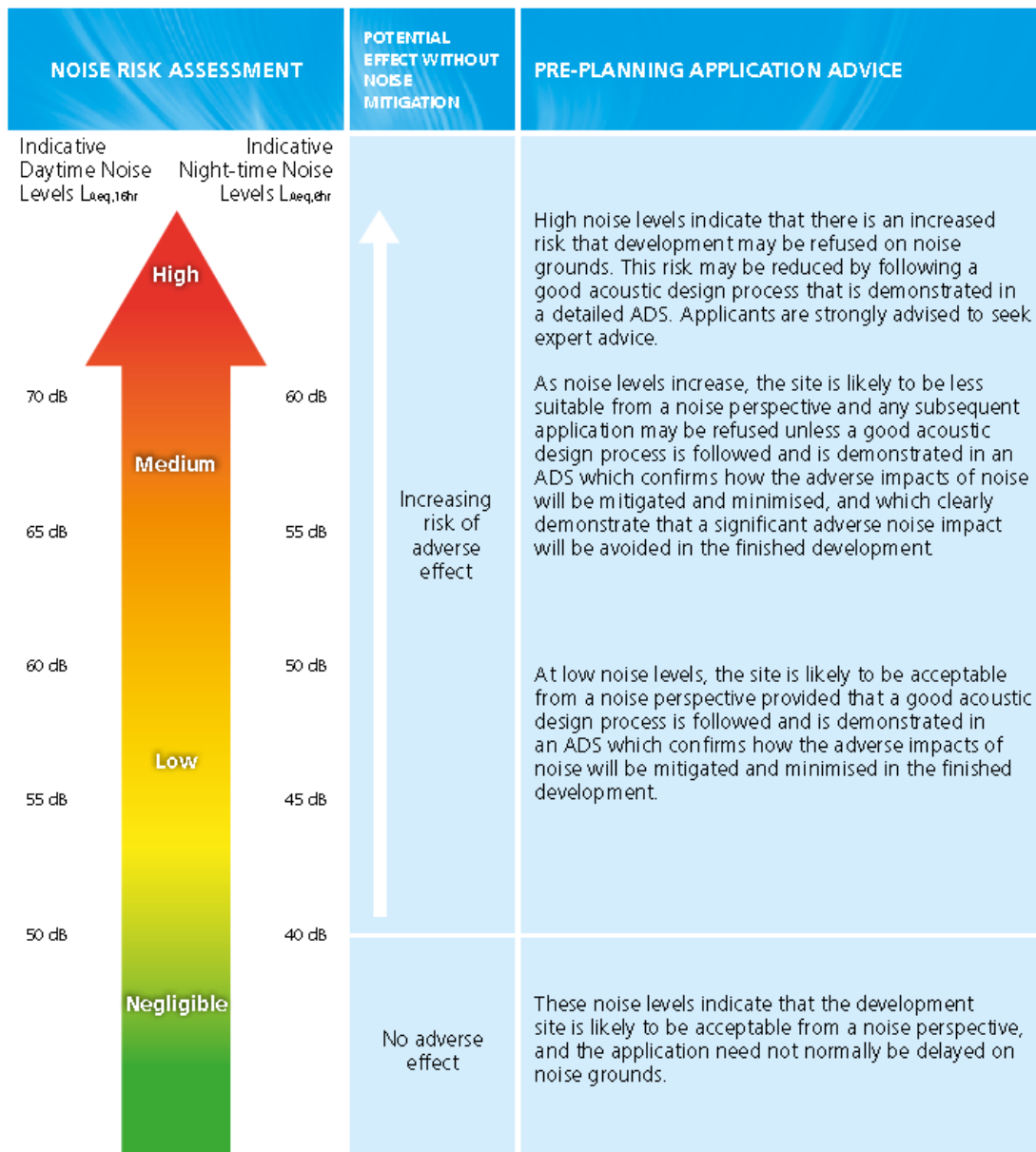


Figure 1 Notes:

- Indicative noise levels should be assessed without inclusion of the acoustic effect of any scheme specific noise mitigation measures.
- Indicative noise levels are the combined free-field noise level from all sources of transport noise and may also include industrial/commercial noise where this is present but is "not dominant".
- $L_{Aeq,16hr}$ is for daytime 0700 – 2300, $L_{Aeq,8hr}$ is for night-time 2300 – 0700.
- An indication that there may be more than 10 noise events at night (2300 – 0700) with $L_{Amax,F} > 60$ dB means the site should not be regarded as negligible risk.

Figure 8-1: Stage 1 Initial Site Risk Assessment

Stage 2 – a systematic consideration of four key elements.

Stage 2 of the recommended approach contains four key elements to be undertaken in parallel, and each is considered in turn below in the following sub-sections.

Stage 2: Element 1 – Good Acoustic Design Process

Stage 2: Element 2 – Internal Noise Level Guidelines

Stage 2: Element 3 – External Amenity Area Noise Assessment

Stage 2: Element 4 – Assessment of Other Relevant Issues

Stage 2: Element 1 – Good Acoustic Design Process

Following a good acoustic design process is an implicit part of achieving good design as required by Government planning and noise policy. It is imperative that acoustic design is considered at an early stage of the development control process. A good acoustic design process takes a multi-faceted and integrated approach to achieve optimal acoustic conditions, both internally (inside noise-sensitive parts of the building(s)) and externally (in spaces to be used for amenity purposes).

Stage 2: Element 2 – Internal Noise Level Guidelines

The second element of Stage 2 is to seek to achieve recommended noise levels inside noise sensitive rooms in new residential development. It is considered that suitable guidance on internal noise levels can be found in “BS8233:2014: Guidance on sound insulation and noise reduction for buildings”.

Stage 2: Element 3 – External Amenity Area Noise Assessment

The third element of Stage 2 is a noise assessment of external amenity areas. The term “assessment” is deliberately used because this element concerns more than just the level of noise outside. BS8233:2014 states that “the acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed, and noise levels should ideally not be above the range 50 – 55 dB LAeq,16hr”. The standard continues... “These guideline values may not be achievable in all circumstances where development might be desirable. In such a situation, development should be designed to achieve the lowest practicable noise levels in these external amenity spaces but should not be prohibited.”

Stage 2: Element 4 – Assessment of Other Relevant Issues

The fourth and final element of Stage 2 is an assessment of other relevant issues. This element seeks to build upon relevant national and local planning and noise policies (item 4(i)) to provide a systematic list of recommendations for the issues that should be considered before making a judgement about the noise aspects of a particular planning proposal for new residential development. Full details of the assessment of other relevant issues should be included in an Acoustic Design Statement (ADS).

An ADS should provide sufficient evidence that the ProPG Stage 1 and Stage 2 Elements 1 to 4 have been followed. An ADS should be proportional to the scale of the development and to the degree of noise risk at the proposed development site. An ADS should not normally be necessary where the noise risk has been properly assessed as negligible during Stage 1. The level of detail provided in an ADS should increase with increasing level of risk.

TYPICAL ISSUES FOR LOW NOISE RISK SITES	ADDITIONAL ISSUES FOR MEDIUM/HIGH NOISE RISK SITES
Relevant noise sources identified	Multiple source contributions carefully quantified
Assess extent of noise risk for unmitigated site (current and foreseeable future, 15 years ahead)	Greater coverage across the site (all buildings, all relevant heights)
	Alternative site layouts considered
	Adequate non-sensitive use for screening
Opportunities to mitigate the noise source within the site	Opportunities to mitigate the noise source outside owned land Physical mitigation, operational management
Maximise separation	Existing topographical advantages Change site level
Noise barriers – screening opportunities	Barriers inside and outside the site
Site layout – protecting residential units	Design external amenity spaces (e.g. balconies) to reduce noise entering sensitive rooms
Site layout – protecting external amenity space	Access to quiet open space on or off-site
Non-sensitive elements as screens	Non-sensitive elements designed as screens
Building layout to self-screen sensitive rooms	Orientation of noise sensitive rooms away from the source of noise exposure i.e. quiet facades
Building treatment to screen openings	Consideration of alternative acoustic options
Window location & size on affected facades	Innovative facade and window designs e.g. plenum windows
	Façade insulation design
Ventilation – natural, from quiet facade	Acoustic performance of ventilation, thermal comfort
	Complete Acoustic Design Process throughout

Figure 8-2: Information to be included in an Acoustic Design Statement (ADS)

Following the ProPG approach will lead to the choice of one of four possible recommendations from the noise practitioner to the decision maker:

- A. Planning consent may be granted without any need for noise conditions;
- B. Planning consent may be granted subject to the inclusion of suitable noise conditions;
- C. Planning consent should be refused on noise grounds in order to avoid significant adverse effects (“avoid”); or
- D. Planning consent should be refused on noise grounds in order to prevent unacceptable adverse effects (“prevent”).

World Health Organisation Guidelines

The World Health Organisation (WHO) published Guidelines for Community Noise in April 1999. The 1999 WHO guidelines recommend a daytime limit of 50 – 55 dB(A) for outdoor living areas. The report states that “to protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady continuous noise should not exceed 55 dB LAeq on balconies, terraces and in outdoor living areas. To protect the majority of people from being

moderately annoyed during the daytime, the outdoor sound level should not exceed 50 dB LAeq. Where it is practical and feasible, the lower outdoor sound level should be considered the maximum desirable sound level for new development". Table 8-3 shows the WHO Guideline noise levels applicable to residential properties.

Table 8-3: Guideline values for community noise in specific environments (World Health Organisation, 1999)

Specific Environment	Critical Health Effects	LAeq (dB)	Time Base (Hrs)	LAFmax (dB)
Outdoor Area during daytime	Serious Annoyance, daytime & evening	55	16	-
	Moderate Annoyance, daytime & evening	50	16	-
Outside Bedrooms during night-time	Sleep disturbance, window open (outdoor values)	45	8	60

8.2.4 Assessing Significance of Operational Noise Impacts

IEMA Guidelines for Noise Impact Assessment (2014)

The Guidelines for Noise Impact Assessment (October 2014) produced by the Institute of Environmental Management and Assessment (IEMA) address the key principles of noise impact assessment and are applicable to all development proposals where noise effects are likely to occur. The guidelines state that the noise level threshold and significance should be determined, based upon the specific evidence and likely subjective response to noise. The criteria above reflect the key benchmarks that relate to human perception of sound. A change of 3 dB(A) is generally considered to be the smallest change in environmental noise that is perceptible to the human ear under most normal conditions. A 10 dB(A) change in noise represents a doubling or halving of the noise level. The difference between the minimum perceptible change and the doubling or halving of the noise level is split to provide greater definition to the assessment of changes in noise level. An impact scale offered by the IEMA guidelines is shown in Table 8-4.

Table 8-4: IEMA Impact from the Change in Sound Levels

Long-term impact classification	Short-term impact classification	Sound Level Change (positive or negative) T = either 16hr day or 8hr night
Negligible	Negligible	>0 dB and <1 dB
	Minor	>1 dB and <3 dB
Minor	Moderate	>3 dB and <5 dB
Moderate	Major	>5 dB and <10 dB
Major		>10 dB

To determine the overall noise impact, the magnitude and sensitivity to changes in noise levels, the Noise Effects Descriptors presented in Table 8-5 are offered by the IEMA guidelines.

Table 8-5: IEMA Impact from the Change in Sound Levels

Impact Level	Description
Very Substantial	Greater than 10 dB LAeq change in sound level perceived at a receptor of great sensitivity to noise.
Substantial	Greater than 5 dB LAeq change in sound level at a noise sensitive receptor, or a 5 to 9.9 dB LAeq change in sound level at a receptor of great sensitivity to noise.
Moderate	A 3 to 4.9 dB LAeq change in a sound level at a sensitive or highly sensitive noise receptor, or a greater than 5 dB LAeq change in sound level at a receptor of some sensitivity.
Slight	A 3 to 2.9 dB LAeq change in a sound level at a receptor of some sensitivity.
None/not significant	Less than 2.9 dB LAeq change in sound level and/or all receptors of negligible sensitivity to noise or marginal to the zone of the influence of the proposed development.

Table 8-6: Relationship between Noise Impact, Effect and Significance (IEMA)

Magnitude (Nature of Impact)		Description of Effect (on a specific sensitive receptor)	Significance
Beneficial	Substantial	Receptor Perception = Marked Change Causes a material change in behaviour and/ or attitude, e.g. individuals begin to engage in activities previously avoided due to preceding environmental noise conditions. Quality of life enhanced due to change in character of the area.	More Likely to be Significant (Greater justification needed- based on impact magnitude and receptor sensitivities- to justify a non-significant effect)
	Moderate	Receptor Perception = Noticeable Improvement Improved noise climate resulting in small change in behaviour and/or attitude, e.g. turning down volume of television; speaking more quietly; opening windows. Affects the character of the area such that there is a perceived change in the quality of life.	
	Slight	Receptor Perception = Just Noticeable Improvement Noise impact can be heard, but does not result in any change in behaviour or attitude. Can slightly affect character of the area but not such that there is a perceived change in quality of life.	
-	Negligible	N/A = no discernible effect on receptor	Less Likely to be Significant Not Significant
Adverse	Slight	Receptor Perception = Non-intrusive Noise impact can be heard, but does not cause change in behaviour or attitude, e.g. turning up volume of television, speaking more loudly; closing windows. Can slightly affect the	Less Likely to be Significant Greater justification needed- based on

		character of the area but not such that there is a perceived change in the quality of life.	impact magnitude and receptor sensitivities- to justify a significant effect)
	Moderate	Receptor Perception = Intrusive Noise impact can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows. Potential for non-awaking sleep disturbance. Affects the character of area such that there is a perceived change in the quality of life.	
	Substantial	Receptor perception = Disruptive Causes material change in behaviour and /or attitude, e.g. avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in getting to sleep, premature awakening, and difficulty in getting back to sleep. Quality of life diminished due to change in character of area.	
	Severe	Receptor Perception = Physically Harmful Significant Changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or psychological effects, e.g. regular sleep deprivation / awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	
			Greater justification needed- based on impact magnitude and receptor sensitivities- to justify a non-significant effect) More Likely to be Significant
			Significant

8.2.5 Sensitive Receptor Locations

The most potentially sensitive receiver locations in proximity to the proposed development have been identified, as shown in Figure 8-3 and summarised in Table 8-7 below.

Table 8-7: Sensitive Receptor Locations assessed

Receptor Description and Location	Grid Reference
R1 – Proposed hospital development (nearest façade to Lucan Road)	304044, 235548
R2 - Failte, 32, Lucan Road, Lucan	304135, 235518
R3 – St Andrews National School, Lucan Road, Lucan	304202, 235585
R4 – Canon Despard Centre / The Village Montessori Preschool, Chapel Hill, Lucan	303936, 235552
R5 – Existing St. Edmundsbury Hospital	304046, 235804

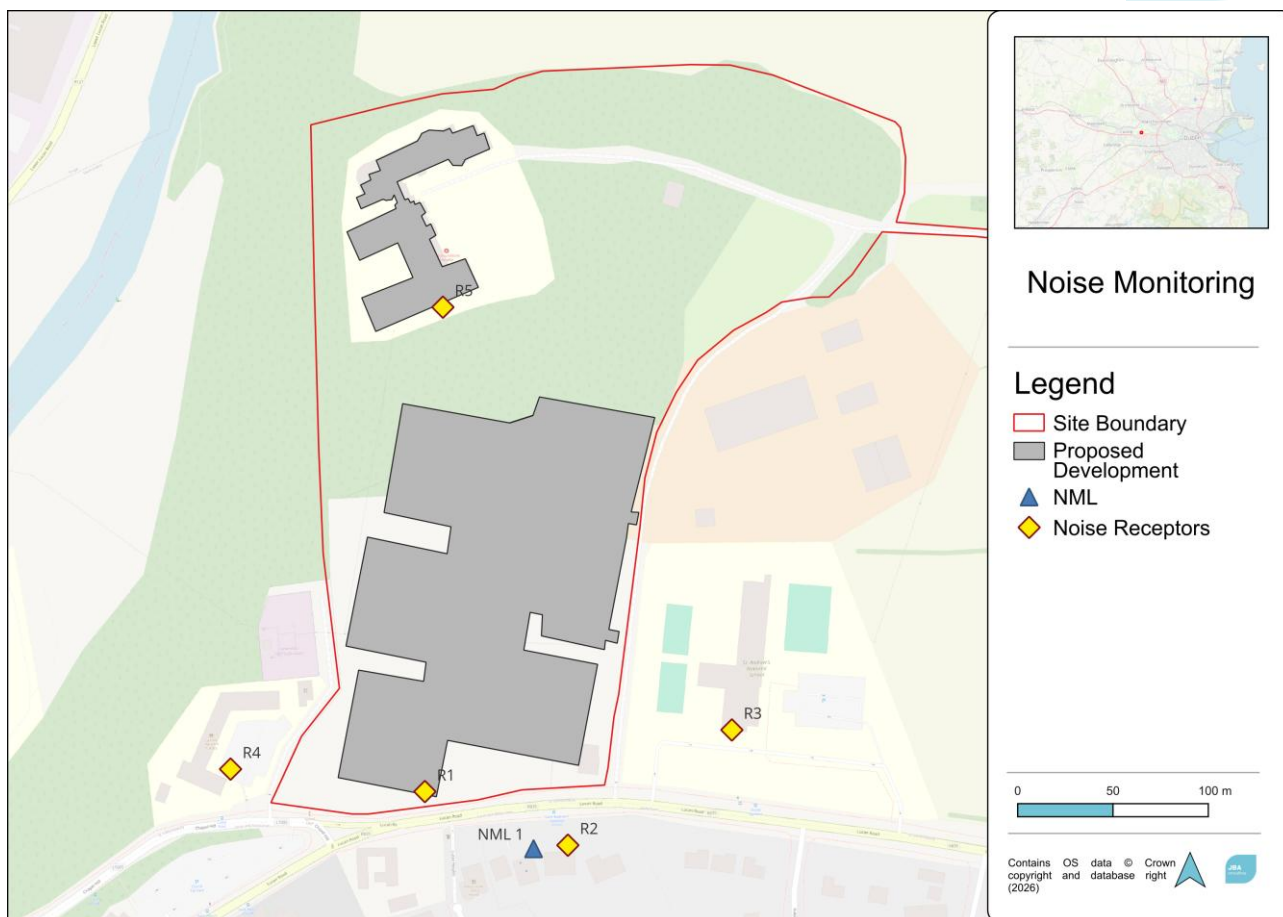


Figure 8-3: Noise Monitoring Location (NML) and selected noise sensitive receptors (R1 – R5) in proximity to the proposed development site

8.2.6 Noise Survey Methodology

A continuous daytime and night-time noise survey in proximity to the nearest residential properties to the proposed development and the main areas of construction activity was undertaken on 9th - 11th May 2023. Figure 8-3 indicates the noise monitoring location (NML) in relation to the nearest residential properties and the proposed development location.

The noise monitoring survey was undertaken in accordance with ISO 1996 Description and Measurement of Environmental Noise. A Norsonic Nor 140 (Serial No. 1402988 – Calibration Date – 13/04/2023) was used during the noise monitoring surveys. The sound level meter was placed at a height of approximately 1.5m and away from reflecting surfaces at the monitoring location. A wind shield was used on the microphone throughout the survey, and the sound level meter was calibrated before and after the survey period. The weather conditions during the daytime and night-time noise surveys were in accordance with ISO 1996.

The measurement parameters recorded during the noise surveys are defined as follows:

- LAeq is the A-weighted equivalent continuous steady sound level during the sample period and effectively represents an average value.
- LA10 is the A-weighted sound level that is exceeded for 10% of the sample period and is used to quantify traffic noise.
- LA90 is the A-weighted sound level that is exceeded for 90% of the sample period and is used to quantify background noise in the absence of the main noise source.

Subjective observations of the noise sources at the monitoring location noted that during the daytime survey period passing traffic on the R835 Lucan Road is the dominant noise source. The existing access road through the St. Edmundsbury Hospital site did not contribute significantly to the background noise level in the area of the proposed development.

8.2.7 Noise Prediction Methodology

8.2.7.1 Construction Noise Prediction

In terms of daytime noise impacts during the construction phase, the worst-case construction noise levels at specific locations in proximity to the expected main areas of construction activity have been predicted assuming specific operating 'on' times for typical equipment associated with such a construction project. BS 5228-1:2009+A1:2014 sets out methods of predicting construction noise levels. Methods are presented for stationary and quasi-stationary activities and for mobile plant using a regular well-defined route (e.g. site haul roads). The predictions account for source-receiver distance, reflections and screening or ground attenuation and a percentage on-time. The closest noise sensitive receivers to the expected main areas of construction activity have been selected to assess if there will be an exceedance of typical daytime construction noise limits at the noise sensitive receivers in the area.

8.2.7.2 Operational Noise Prediction

Vehicles travelling to and from the proposed development have the potential to generate a negative impact due to traffic noise at nearby receiver locations. The operational traffic noise impact assessment has assessed and compared the traffic noise which is associated with road traffic travelling to and from the existing and proposed St. Edmundsbury Hospital site.

Existing and future predicted AM and PM Peak Hour traffic data were used to predict the relative traffic noise impact at the nearby sensitive locations due to the proposed development. The relative change in traffic noise level has been assessed based on the development AM and PM Peak Hour trip generation as a percentage of the existing road network traffic flow using the calculation methodologies outlined in the Calculation of Road Traffic Noise (CRTN) produced by the UK Department of Transport (Welsh Office).

The existing 2.5m high wall along the Lucan Road site boundary, which will be retained, will act as a significant noise barrier and significantly attenuate traffic noise at the façade of the proposed hospital building.

The likely future perceived impact of change in traffic noise levels at noise sensitive properties adjacent to the proposed development has been determined and the perceived impact of change in traffic noise level has been reported for the noise sensitive receivers during AM and PM peak hour

8.3 Receiving Environment

The existing daytime and night-time noise levels along the site boundary of the St. Edmundsbury Hospital site is dominated by road traffic noise from the R835 Lucan Road. The results of the noise monitoring survey during daytime and night-time are presented in Table 8-8.

The results of the baseline noise monitoring indicate that the noise levels in the area of the proposed development are in accordance with the World Health Organisation (WHO) Guidelines for Community Noise, recommended levels of 50 – 55 dB(A) for outdoor living areas during daytime and the recommended external noise level of 45 dB(A) during night-time.

Table 8-8: Summary of noise monitoring data at noise monitoring location (NML) during daytime and night-time

Period	LAeq	LA10	LA90
Daytime 0700 - 2300	54.9	57.1	51.5
Evening 1900 - 0700	53.9	56.7	49.4
Night-time 2300 - 0700	47.5	50.4	41.6

Based on the ProPG recommended Noise Risk Categories for new developments near existing noise sources as outlined in Figure 8-1 and Figure 8-2, the noise level recorded at the proposed hospital development site, indicates the following;

During Daytime, the site is in the Low Risk Category.

During Night-time, the site is in the Low Risk Category.

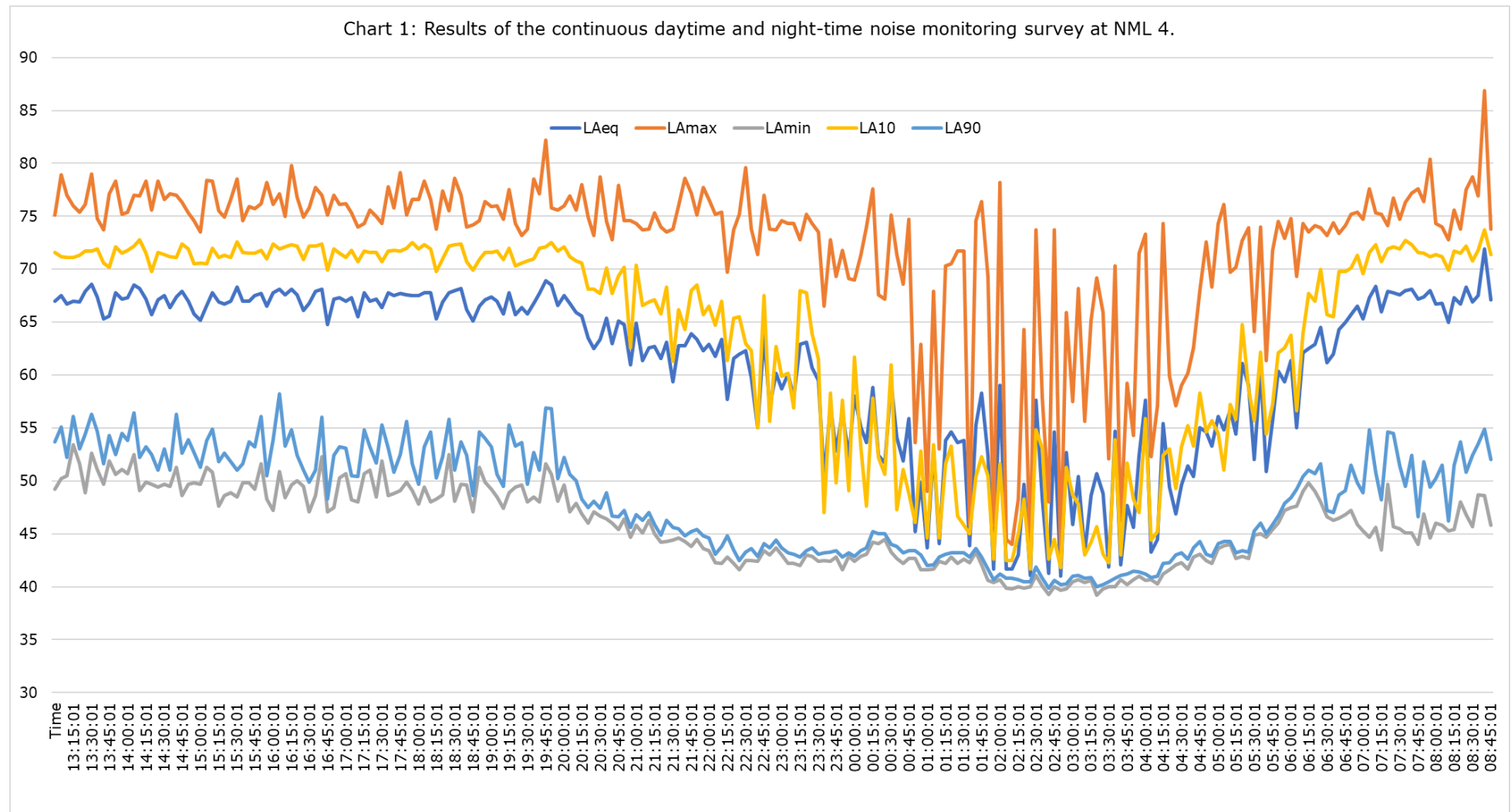


Figure 8-4: Results of the continuous daytime and night-time noise monitoring survey at NML 4

8.4 Potential Effects

8.4.1 Construction Noise Impact

8.4.2 Construction Noise Prediction

The noise impact as a result of the construction phase of the proposed development will have the potential to be perceptible at nearby residential properties but this will be intermittent and temporary. Construction activities will not take place during night-time hours. The following construction practices have the potential to produce intermittent and temporary noise impacts:

- Site Clearance & Excavation - Dozers, tracked excavators & dump trucks, etc.;
- Infilling / Levelling - Excavators, wheeled loaders & rollers, etc.;
- Road construction work - Excavators, Concrete mixer trucks & tarmacadam delivery vehicles;
- General Construction - Masonry construction, etc.
- The proposed development will generate HGV movements throughout the duration of the construction period.

Construction noise can be assessed in terms of the equivalent continuous sound level and/or in terms of the maximum level. The level of sound in the neighbourhood that arises from a construction site depends on a number of factors and the estimation procedures need to take into account the following significant factors;

- the sound power outputs of processes and plant;
- the periods of operation of processes and plant;
- the distances from sources to receiver;
- the presence of screening by barriers;
- the reflection of sound;
- ground attenuation;
- meteorological conditions (particularly wind speed and direction), and
- atmospheric absorption.

Typical noise levels from construction works likely to take place during construction phase of proposed development are outlined in Table 8-9.

Table 8-9: Typical Noise Levels from Construction Sources likely to be required during the construction phase of the proposed development (Source: BS 5228)

Ref No.	Equipment	A-weighted sound pressure level, LAeq, dB @ 10m
Table C.2 Sound level data on site preparation		
Clearing Site & Ground excavation/earthworks		
1	Dozer ж (142 kW, 20T)	75 ж
3	Tracked excavator (102 kW, 22T)	78
12	Dozer (142 kW, 20T)	80
14	Tracked excavator (226 kW, 40T)	79
Loading lorries		
27	Wheeled loader (493 kW)	80
Distribution of material		
30	Dump truck (tipping fill) (306 kW, 29T)	79
31	Dump truck (empty) (306 kW, 29T)	87
Rolling and compaction		
37	Roller (rolling fill) ж	79 ж
Table C.4 Sound level data on general site activities		
Distribution of materials		
1	Articulated dump truck ж	81 ж
Mixing & Pumping concrete		
20	Concrete mixer truck	80
Trenching		
63	Tracked excavator	77
Power for site cabins		
84	Diesel generator	74
Pumping water		
88	Water pump (diesel) (10 kW, 100Kg)	68
Sweeping and dust suppression		
90	Road sweeper (70 kW)	76
91	Dust suppression unit trailer	78
Table C.5 Sound level data on road construction works		
Breaking road surface & concrete		
1	Backhoe mounted hydraulic breaker	88
6	Hand-held pneumatic breaker	95

ж Drive-by maximum sound pressure level in LAmax (overall level)

(Ref: BS 5228 Noise on Construction and Open sites)

It is most likely that the above outlined construction activities will occur separately throughout periods of construction at each construction works location. The proposed construction works over the entire project will occur for less than 6 - 9 months. Works will not be continuous over the construction period at any one location. By its nature, specific construction work phases of such a proposed development are transient in terms of locations of precise activities on site from time to time. Therefore, the predicted worst-case LAeq,1 hour noise levels at specific locations have been outlined to present a range of worst-case noise levels that have the potential to occur at various stages throughout the construction period.

The predicted worst-case construction noise levels at selected sample locations in proximity to future construction works are summarised in Table 8-10 below. The predictions in Table 8-10 give an indication of worst-case intermittent construction noise levels at the most sensitive residential receivers in proximity to the proposed construction works. It is important to note, that these predicted noise levels are not typical of continuous construction noise levels.

Table 8-10: Predicted worst-case construction noise levels at specific locations in proximity to construction works

Likely Sources	Construction Noise	Worst-case Predicted Construction Noise Level LAeq, 1 Hour (dB) @ selected properties			
		@ R 2, nearest properties along Lucan Road	@ R 3 St. Andrew's National School	@ R 4 The Village Montessori Pre-School	@ R 5, Existing St. Edmundsbury Hospital
1. Excavation works (With 30T Excavator, 40T Dumper Truck & Dozer (Spreading fill)) (All operating concurrently)		61 dB(A) (at 40m from works with 10 dB attenuation for full screening)	61 dB(A) (at 100m from works with 0 dB attenuation for no screening)	54 dB(A) (at 75m from works with 10 dB attenuation for full screening)	69 dB(A) (at 30m from works with 5 dB attenuation for partial screening)
2. Foundation construction works (With 30T Excavator, 40T Dumper Truck, Concrete Mixer Truck & Vibratory Roller) (All operating concurrently)		58 dB(A) (at 50m from works with 10 dB attenuation for full screening)	60 dB(A) (at 100m from works with 0 dB attenuation for no screening)	53 dB(A) (at 75m from works with 10 dB attenuation for full screening)	68 dB(A) (at 30m from works with 5 dB attenuation for partial screening)
3. Car park construction works (With 30T Excavator, 40T Dumper & Asphalt Spreader) (All operating concurrently)		59 dB(A) (at 40m from works with 10 dB attenuation for full screening)	67 dB(A) (at 50m from works with 0 dB attenuation for no screening)	41 dB(A) (at 200m from works with 10 dB attenuation for full screening)	46 dB(A) (at 200m from works with 5 dB attenuation for partial screening)
Construction Noise Limit		70 dB(A) Leq, 12 Hour			

NOTE

1. Worst case scenario - all items of plant operating simultaneously, at full power for 45 minutes in every hour, at a relative site position to the receptor.
2. 0 dB(A) attenuation – predictions assume 0 dB(A) for no screening, 5 dB(A) for partial screening and 10 dB(A) for full screening between receptor and source
3. Calculation Method - PREDICTION OF NOISE FROM QUASI STATIONARY PLANT [ACTIVITY LAEQ METHOD, BS5228]

8.4.3 Construction Noise Impact Significance

In accordance with the BS 5228-1:2009+A1: 2014 Noise and Vibration Control on Construction and Open Sites Part 1: Noise 'ABC method', the ambient noise levels (rounded to the nearest 5 dB) in the area of the proposed construction works are approximately 55 dB LAeq,T during daytime. As a result, the noise sensitive receivers fall into Category B of the 'ABC' assessment methodology, i.e. construction noise limit is 65 dB(A) Leq, 12 Hour.

It is important to note that construction noise impacts will occur during daytime hours only and will be short-term at each area of construction of the proposed development. Not all construction noise sources will operate at once and construction noise levels are likely to vary significantly throughout the typical working day.

A pragmatic approach needs to be taken when assessing the significance of noise effects of any construction project. The significance of the construction noise from the project has been determined by considering the change in the ambient noise level with the construction noise on-going. BS5228 states that noise levels generated by construction activities are deemed to be significant if the total noise (pre-construction ambient plus construction noise) exceeds the pre-construction ambient noise by 5 dB or more, subject to lower cut-off values of 65 dB, 55 dB and 45 dB LAeq, Period, from construction noise alone, for the daytime, evening and night-time periods, respectively; and a duration of one month or more, unless works of a shorter duration are likely to result in significant impact.

BS5228 also states that for public open space, impact might be deemed to be significant if the total noise (pre-construction ambient plus construction noise) exceeds the pre-construction ambient noise (LAeq, Period) by 5 dB or more for a period of one month or more. Based on the BS5228 'ABC' assessment methodology, the contractor should aim to limit daytime construction noise to 65 dB LAeq,12 Hour at all works areas with the application of appropriate mitigation measures.

Based on the estimated duration of works at the proposed development there will be a temporary noise impact at the nearest sensitive receivers due to the proposed construction works. In some of the works areas, the predicted worst-case 1-hour construction noise levels may be in excess of the recommended maximum noise level of 65 dB LAeq, 12 Hour at 1m from the façade of the nearest sensitive receivers. Noise from construction works will fluctuate throughout the course of a typical working day as well as over the course of the construction works being undertaken in any one location. Therefore, the daytime construction noise limit of 65 dB LAeq, 12 Hour should be achieved at the nearest residential properties. The construction noise impacts will be **Temporary, Not Significant, Adverse** and will not be a significant impact.

Appropriate construction mitigation measures outlined below will be implemented as part of the Construction Environmental Management Plan (CEMP).

8.4.4 Construction Vibration Impact

Construction vibration impacts have the potential to occur only if blasting, rock breaking and/or piling works are undertaken in very close proximity to sensitive receivers. It is not expected that blasting, rock breaking and/or piling works are to be undertaken.

If such works are deemed to be necessary, it is proposed that vibration monitoring will be carried out for all properties in close proximity, i.e. <100m to construction areas where blasting, rock breaking and/or piling works are required. If such works are deemed to be necessary, precondition surveys will be carried out at properties in close proximity to the construction works i.e. <100m. Survey and monitoring locations will be identified during detailed design and agreed with residents/owners as part of the CEMP in advance of the construction works. A programme of noise monitoring and vibration monitoring (if required) at sensitive receivers will be detailed by the Contractor prior to blasting, rock breaking and/or piling works beginning. This will allow for a constant review of noise and vibration (if required) levels generated by the construction of the proposed scheme and will highlight the need for further mitigation measures should they be required.

The relevant vibration limits for the duration of the construction works are set out and represent the allowable vibration in order to minimise the risk of building damage. Specifically, noise & vibration levels shall be kept below the levels specified, or of limits which may be imposed by the Competent Authorities. If vibration monitoring results indicate that levels are approaching the standard limits, appropriate mitigation measures will to be put in place to ensure that vibration levels are reduced to acceptable levels.

Accurate vibration level prediction is extremely difficult due to a significant number of variables that apply to such calculations, e.g. blasting, rock breaking and/or piling methods, ground conditions, etc. Therefore, if required, the contractor will ensure that the TII Guidelines which identify limits for protection against cosmetic damage as a function of vibration frequency are not exceeded through measures such as the use of a low vibration piling method and continuous monitoring of vibration levels during any piling that may have the potential to result in a vibration impact at nearby properties. However, as stated above, at distances of in excess of 100m from the nearest residences, vibration from low vibration piling methods, for example, will not be perceptible. The effect will be **Temporary, Not Significant, Neutral**.

The movement of construction vehicles to each of the proposed works areas will be via the existing road network. The resultant vibration levels from infrequent passing HGV traffic will be insignificant and no greater than is currently experienced when HGVs pass along the road network.

8.4.5 Operational Noise Impact

8.4.5.1 Operational Traffic Noise Impact

This section of the assessment identifies the potential impacts on the environment associated with the proposed hospital development during operation.

A vehicle turning movement survey was undertaken on Wednesday 22nd February 2023. The count was carried out over the 12-hour period from 07:00 hours to 19:00 hours and included both the morning and evening peak periods. The date was chosen while schools were open to ensure the maximum volume of traffic was included. The count was designed to identify the critical peak hour periods of traffic flow through the adjacent junctions. At present, two existing vehicular accesses on the Lucan Road provide an access to the existing St. Edmundsbury Hospital via two internal roads, which are connected to each other, as shown in Figure 8-5. The Western Vehicular Access and Eastern Vehicular Access are located at Junction 1 and Junction 2 respectively. The proposed development will be mainly served by the existing Western Vehicular Access, which will connect to Lucan Road directly at Junction 1. Also, the proposed development will connect to the existing Eastern Vehicular Access at Junction 2 via the internal roads as shown in Figure 8-5.



Figure 8-5: Road Network adjacent to the Proposed Development

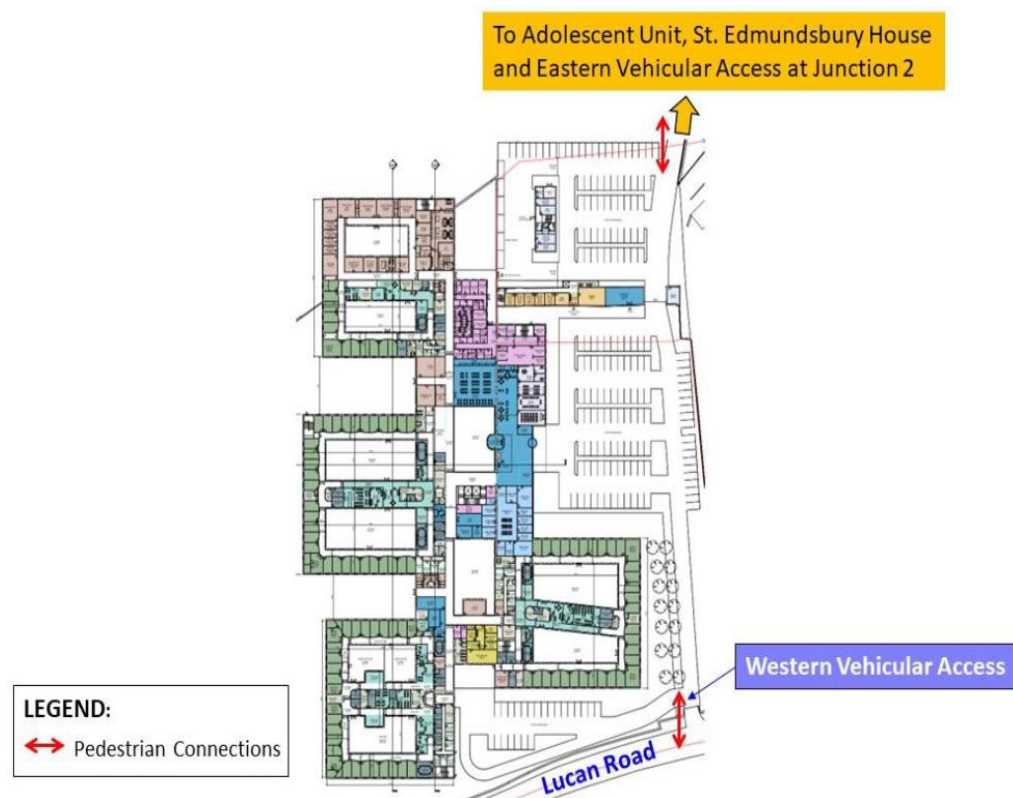


Figure 8-6: Proposed Western Vehicular Access to the Proposed Development

Table 8-11: Development AM Peak Hour Trip Generation as a Percentage of Existing Road Network Traffic Flow

Junction	Junction AM Peak Traffic	Development Generated Traffic	Percentage Change	Change in Traffic Level	Change in Noise Level
Junction 1 – Western Access Road to St. Edmundsbury Hospital / Lucan Road	1316	92	7%	+ 0.3 dB(A)	
Junction 2 – Eastern Access Road to St. Edmundsbury Hospital / Lucan Road / Esker Lane	1702	72	4.20%	+ 0.2 dB(A)	
Junction 3 – R136 / Lucan Road	2173	71	3.30%	+ 0.2 dB(A)	
Junction 4 – Lucan Road / Access to Hermitage Golf Club	1033	12	1.10%	+ 0.1 dB(A)	
Junction 5 – R136 / N4 Slip Road (Eastbound)	1823	60	3.30%	+ 0.2 dB(A)	
Junction 6 – R136 / N4 Slip Road (Westbound)	2450	57	2.30%	+ 0.2 dB(A)	
Junction 7 – Chapel Hill / Lucan Road	1364	36	2.60%	+ 0.2 dB(A)	

Table 8-12: Development PM Peak Hour Trip Generation as a Percentage of Existing Road Network Traffic Flow

Junction	Junction PM Peak Traffic	Development Generated Traffic	Percentage Change	Change in Traffic Level	Change in Noise Level
Junction 1 – Western Access Road to St. Edmundsbury Hospital / Lucan Road	1414	127	9%	+ 0.4 dB(A)	
Junction 2 – Eastern Access Road to St. Edmundsbury Hospital / Lucan Road / Esker Lane	1555	56	3.60%	+ 0.2 dB(A)	
Junction 3 – R136 / Lucan Road	2046	54	2.70%	+ 0.2 dB(A)	
Junction 4 – Lucan Road / Access to Hermitage Golf Club	787	21	2.70%	+ 0.2 dB(A)	
Junction 5 – R136 / N4 Slip Road (Eastbound)	1808	30	1.70%	+ 0.1 dB(A)	
Junction 6 – R136 / N4 Slip Road (Westbound)	2450	29	1.20%	+ 0.1 dB(A)	
Junction 7 – Chapel Hill / Lucan Road	1464	75	5.10%	+ 0.3 dB(A)	

In terms of changes in traffic flow, there will be no significant change of traffic flow volumes in proximity to the nearest sensitive receiver locations along the surrounding road network when the proposed development becomes operational. Therefore, together with no significant changes in traffic flow volumes there is predicted to be no perceptible changes in traffic noise levels and hence no significant impact at the surrounding residential and noise sensitive school receiver locations. The effect will be Permanent, Not Significant, Neutral.

The highest predicted relative change in noise level is predicted to be <1dB(A). This is defined as a 'Negligible' change in noise level.

On the basis of the above findings and the predicted relative noise impact on residential properties in proximity to the proposed development, the noise impact assessment has indicated that no existing properties will require additional noise mitigation measures as a result of the proposed development.

8.5 Mitigation Measures

8.5.1 Construction Noise Mitigation Measures

Appropriate mitigation measures have been identified to ensure the Construction Phase target noise limits are not exceeded. The contractor will be required to implement the control measures recommended in BS 5228 and apply the appropriate measures where applicable. Other measures will include:

- Working hours during site construction operations will be restricted to daytime hours from 07:30 hours to 18:00 hours (Monday to Friday) and, as may be required, from 08:00 hours to 13:00 hours (Saturdays). Evening and night-time work is not expected to take place.
- An on-site speed limit will be enforced for all traffic. Drivers of vehicles will be advised of the speed limits through the erection of signs i.e. a typically recommended on site speed limit is 10 km/hr.
- Where practicable, the use of quiet working methods and the most suitable plant will be selected for each activity having due regard to the need for noise control.
- Best practicable means will be employed to minimise noise emissions and will comply with the general recommendations of BS 5228. To this end operators will use "noise reduced" plant and/or will modify their construction methods so that noisy plant is unnecessary.
- By positioning potentially noisy plant as far as possible from noise sensitive receivers the transmission of sound can be minimised. Earth mounds and/or stockpiles of material or perimeter fencing on site can be used as a physical barrier between the source and the receiver.
- Mechanical plant used on site will be fitted with effective exhaust silencers. Vehicle reverse alarms will be silenced appropriately in order to minimise noise breakout from the site while still maintaining their effectiveness.
- All plant will be maintained in good working order. Where practicable, machines will be operated at low speeds and will be shut down when not in use.
- Compressors will be of the "noise reduced" variety and fitted with properly lined and sealed acoustic covers.
- In all cases engine and/or machinery covers will be closed whenever the machines or engines are in use.
- All pneumatic percussive tools will be fitted with mufflers or silencers as recommended by the equipment manufactures. Where practicable, all mechanical static plant will be enclosed by acoustic sheds or screens.
- Employees working on the site will be informed about the requirement to minimise noise and will undergo training on the following aspects:

- The proper use and maintenance of tools and equipment.
- The positioning of machinery on-site to reduce the emission of noise to the noise sensitive receivers.
- Avoidance of unnecessary noise when carrying out manual operations and when operating plant and equipment.
- The use and maintenance of sound reduction equipment fitted to power pressure tools and machines.
- Where excessive noise levels are recorded, further mitigation measures will be employed which may include temporary wooden hoarding / acoustic screening to be installed to a height of no less than 2.5m around areas of construction where loud noise levels occur.
- The contractor will ensure that the TII Guidelines which identify limits for protection against cosmetic damage as a function of vibration frequency are not exceeded through the use of the selected low vibration piling method.
- Responsible Person –The Contractor will appoint a responsible and trained person who will be present on site and who will be willing to answer and act upon complaints and queries from the local public.
- Night-time Working - If there are items of plant (e.g. dewatering pumps and similar) in use during night-time hours they will be chosen, sited and enclosed such that levels at the nearest properties do not exceed the measured background noise levels.
- Where deemed necessary due to excessive impact or complaints received, noise and vibration monitoring will be undertaken during construction works to determine noise and vibration levels at sensitive receivers. On the basis of the findings of such noise and vibration monitoring, appropriate noise and vibration mitigation measures will be implemented to reduce noise and vibration impacts.

8.5.2 Operational Noise Mitigation Measures

The proposed development will not result in a significant operational noise impact. Therefore, no specific operational mitigation measures are deemed necessary.

The existing 2.5m high wall along the Lucan Road site boundary, which will be retained, will act as a significant noise barrier and significantly attenuate traffic noise at the façade of the proposed hospital building. No specific glazing recommendations are necessary due to the fact that in terms of the ProPG recommended Noise Risk Categories for new developments near existing noise sources, the proposed hospital development site is in the Low Risk Category during Daytime and Night-time. Therefore, standard modern double glazing will significantly attenuate any traffic noise from the Lucan Road and surrounding road network.

All future plant and equipment associated with the proposed development will be installed in a suitable location and will not produce a noise level in excess of existing background noise levels, in accordance with BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound. As is common practice, it is incumbent on all future plant and equipment technology providers to locate, house and attenuate any such plant and equipment so that any future development users will not experience a significant adverse noise impact. In so doing, this will also ensure that any existing residential properties in the area will not experience a significant adverse noise impact.

8.5.3 Conclusions

The assessment of construction noise impacts from the proposed development has indicated that construction noise limit criteria will not be exceeded at the nearest residential properties during daytime. Very occasionally elevated construction noise may occur when heavy construction activity occurs in close proximity to noise sensitive receivers. However, noise from construction works will fluctuate throughout the course of a typical working day as well as over the course of the construction works being undertaken in any one location.

Therefore, the daytime construction noise limit of 65 dB LAeq,12 Hour will be achieved at the nearest residential properties. The construction noise impacts will be short-term and will not be significant. Also, while the overall construction activities will occur over less than 12 months, the nature of the proposed construction works and duration will mean that noise sensitive receivers will not be exposed to continuous construction noise impact during the construction period. Appropriate construction mitigation measures have been outlined and once implemented, the residual impacts from the construction period will not be significant.

In terms of operational noise, there will be no significant change in AM and PM Peak Hour traffic flow volumes in proximity to the nearest sensitive receiver locations along the surrounding road network when the proposed hospital development becomes operational. Therefore, the effect is predicted to be **Permanent, Not significance, Neutral** in terms of perceptible changes in traffic noise levels.

The existing 2.5m high wall along the Lucan Road site boundary, which will be retained, will act as a significant noise barrier and significantly attenuate traffic noise at the façade of the proposed hospital building. No specific glazing recommendations are necessary due to the fact that in terms of the ProPG recommended Noise Risk Categories for new developments near existing noise sources, the proposed hospital development site is in the Low Risk Category during Daytime and Night-time. Therefore, standard modern double glazing will significantly attenuate any traffic noise from the Lucan Road and surrounding road network.

On the basis of the above findings and the predicted relative noise impact on residential properties in proximity to the proposed hospital development, the noise impact assessment has indicated that no additional noise mitigation measures need to be included in the proposed hospital development project.

8.6 Residual Impacts

8.6.1.1 Construction stage

Construction noise mitigation measures and good construction site management and practice is capable of effectively mitigating the potential for significant construction noise impact at all nearby existing noise sensitive receivers. Therefore, the potential for construction noise impact at the nearest residential properties will be controlled to ensure construction noise impacts are of negligible significance.

Based on the estimated duration of works at the proposed development site, there will be a temporary noise impact at the nearest sensitive receivers due to the proposed construction works. In some of the works areas, the predicted worst-case 1-hour construction noise levels may be in excess of the recommended maximum noise level of 65 dB LAeq, 12 Hour at 1m from the façade of the nearest sensitive receivers. Noise from construction works will fluctuate throughout the course of a typical working day as well as over the course of the construction works being undertaken in any one location. The construction mitigation measures outlined will be implemented as part of the Construction Environmental Management Plan (CEMP). Therefore, the daytime construction noise limit of 65 dB LAeq, 12 Hour should be achieved at the nearest residential properties. The residual construction noise impacts will be **Temporary, Not Significant, Adverse**.

8.6.2 Operation Phase

An assessment of the potential noise impact due to traffic and plant noise as a result of the proposed development on the existing nearby residential properties and the future residents of the proposed development has been undertaken.

In terms of changes in traffic flow, there will be no significant change of traffic flow volumes in proximity to the nearest sensitive receiver locations along the surrounding road network when the proposed development becomes operational. Therefore, together with no significant changes in traffic flow volumes there is predicted to be no perceptible changes in traffic noise levels and hence no significant impact at the surrounding residential and noise sensitive school receiver locations.

All future plant and equipment associated with the proposed development will be installed in a suitable location and will not produce a noise level in excess of existing background noise levels, in accordance with BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound. As is common practice, it is incumbent on all future plant and equipment technology providers to locate, house and attenuate any such plant and equipment so that any future development users will not experience a significant adverse noise impact. In so doing, this will also ensure that any existing residential properties in the area will not experience a significant adverse noise impact.

Therefore, as per the assessment criteria in section 8.2, the residual operational impact of the proposed development in relation to noise is considered a **Long-term, Not Significant, Neutral** impact which is overall 'Not Significant' in EIA terms.

8.7 Interactions

Population and Human Health

An adverse noise impact in either the construction or operational phase has the potential to cause noise nuisance issues. The construction phase noise mitigation measures that will be put in place at the proposed development site will ensure that the construction noise levels are in accordance with relevant guidelines and suggested construction phase noise limits at nearby residential properties. Therefore, the predicted construction phase noise impact through interaction will be **Temporary, Adverse, Not Significant**. During operation, the predicted impact would be **Long-term, Neutral, Not Significant**.

Biodiversity

Noise and vibration have the potential for direct impacts on the surrounding fauna, particularly during the construction phase. The construction phase noise mitigation measures that will be put in place at the proposed development site will ensure that the construction noise levels are in accordance with relevant guidelines and suggested construction phase noise limits. The construction phase impacts through interaction are predicted to be **Temporary, Slight, Not Significant**. During operation, the impacts are predicted to be **Long-term, Imperceptible, Not Significant**.

Material Assets

Interactions between noise and traffic can be significant. The impacts of the proposed development on traffic noise levels have been assessed by reviewing the change in annual average daily traffic flows on the surrounding road network. In this assessment, the impact of the interactions between traffic and noise are considered to be **Temporary, Adverse, Not Significant**. In terms of the operation phase, the predicted noise impacts would be **Long-term, Adverse, Not Significant** with respect to the operational phase in terms of noise impacts at nearby residential properties.

Mitigation of combined effects is best achieved through management and control measures to prevent the individual impacts in the first instance or reduce the impacts and therefore reduce the likelihood of such interactions occurring.

With the appropriate noise mitigation measures during construction, it is predicted that interactions between Noise and Population and Human Health not be significant.

All mitigation measures outlined in the respective chapters of this EIAR will be implemented in full to ensure the potential impact is minimised in relation to construction and operational impacts.

8.8 Potential Cumulative Effects

In relation to the cumulative impact of the proposed development, with other proposed developments planned in the area, the list of developments noted from Chapter 13 have been reviewed.

The construction phase of the proposed development, in combination with the construction phases of projects in the surrounding area could have the potential to negatively impact on noise levels in the area due to cumulative construction phase impact.

All proposed developments which could be considered to have the potential to result in a significant cumulative noise impact, are in excess of 500 metres away from the proposed development. Therefore, no projects in the area are predicted to result in cumulative impact in terms of noise.

9 Material Assets

9.1 Introduction

Material assets (as defined by the EPA) covers three separate aspects: Traffic, Built Services/ Utilities and Waste Management. The assessment of material assets includes a desk-based exercise, to identify traffic and transport aspects, properties, utilities and waste resources that may be affected by the proposed scheme.

9.2 Assessment Methodology

9.2.1 Traffic

Following communication with South Dublin County Council, a Traffic and Transport Assessment (TTA) was carried out. The TTA was undertaken through desk-based study, site visits, traffic observations, architectural plans, traffic count surveys, and future trip prediction modelling using the Trip Rate Information Computer System (TRICS) database. The assessment identified roads, footpath, cycleways and public transport routes that may be affected during the construction and operational phases of the proposed development. The TTA aims to:

- Identify current transportation conditions;
- Quantify the likely increase of traffic flows to and from the proposed development onto the surrounding road network;
- Predict the likely impact from vehicle traffic flows to and from the proposed development on the surrounding road network;
- Identify if the proposed development may have any potential impact on vulnerable road users; and
- Identify suitable mitigation measures for any traffic and transportation impacts associated with the proposed development.

9.2.2 Built services

The assessment of effects of the proposed development on built services will comprise a desk-based exercise, to identify existing properties, utilities and resources that may be affected and measures to mitigate impacts on the surrounding environs.

9.2.3 Waste Management

The assessment of effects of the proposed development on waste management will comprise a desk-based exercise, to identify types of waste occurring during construction and operational stages and any impacts and measures to mitigate impacts on the surrounding environs.

9.3 Receiving Environment

9.3.1 Traffic

Based on consultation with South Dublin County Council it was agreed the TTA would examine the impact of the proposed development on the following seven junctions surrounding the development:

- Junction 1 - Western Access Road to St. Edmundsbury Hospital / Lucan Road;
- Junction 2 - Eastern Access Road to St. Edmundsbury Hospital / Lucan Road / Esker Lane;
- Junction 3 - R136 / Lucan Road;
- Junction 4 - Lucan Road / Access to Hermitage Golf Club;

- Junction 5 - R136 / N4 Slip Road (eastbound);
- Junction 6 - R136 / N4 Slip Road (westbound); and
- Junction 7 - Chapel Hill / Lucan Road.

These junctions were selected as they are considered the junctions most likely to be affected by traffic associated with the proposed development. As a result, these seven junctions formed the study area for the TTA. The locations of the seven junctions are illustrated in Figure 9-1 below.

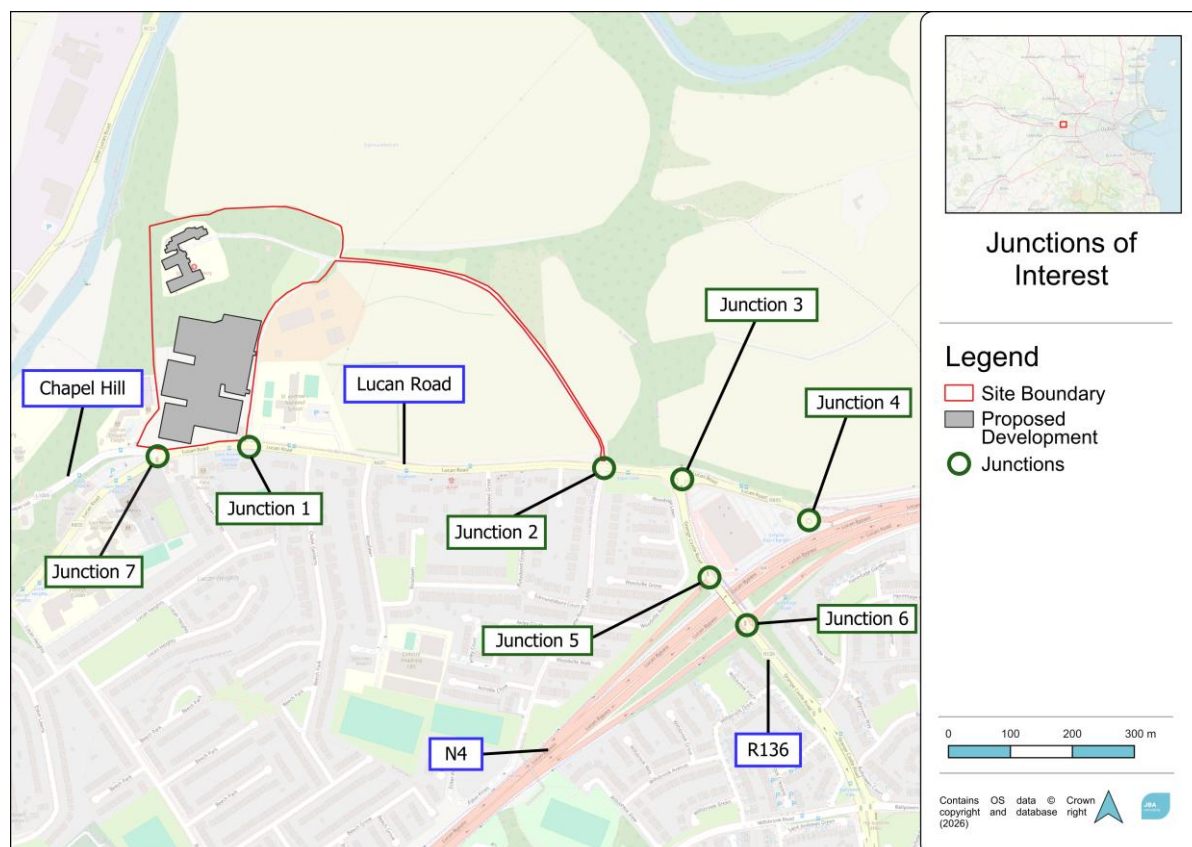


Figure 9-1: Location of the proposed development and junctions of interest (Google maps)

A vehicle turning movement survey was undertaken on Wednesday, 22nd February 2023. The count was carried out over a 12-hour period from 07:00 hours to 19:00 hours and included both the morning and evening peak periods. This date was chosen as it was a normal working day and schools were open, this ensured that the maximum volume of traffic was included. The count was designed to identify the critical peak hour periods of traffic flow through the adjacent junctions. Data was collected in 15-minute intervals and the following count classifications were employed:

- Cars;
- Taxi;
- Light Goods Vehicles (LGV);
- Motorcycles (M/C);
- Oversize Goods Vehicles 1 (OGV1);
- Oversize Goods Vehicles 2 (OGV2);

- Public Service Vehicles (PSV);
- Pedal Cycles (P/C)

The proposed development is located to the North of Lucan Road, which connects to the R136 and the Chapel Hill. Lucan Road runs in the East-West direction along the southern wall of the site. Between Junctions 1 and 7, Lucan Road has two bi-directional lanes which split into a three-lane bi-directional road (including one bus lane) between Junctions 1 and 4.

The current hospital (St Edmundsbury Hospital) is served by two vehicular accesses located on the Lucan Road (Junction 1 to the West and Junction 2 to the East). There are footpaths running along both sides of Lucan Road, no cycle lanes are present. The speed limit along the road is 50 kph.

The R136 is located to the East of the proposed development. It provides access to the N4 via the Lucan Road. It is a bi-directional four-lane road and includes one footpath. There are cycle lanes present along both sides of the road between Junctions 3 and 5, no cycle lane exists between Junctions 5 and 6.

The closest bus stop is situated just outside the entrance to the site on Lucan Road and a second bus stop is located 120m from the site, also on Lucan Road. The bus services provide links to the Adamstown, Clondalkin Fonthill, Clonsilla, Leixlip Confey and Leixlip Louisa Bridge train stations (all within approximately 6km).

9.3.2 Utilities

Receiving environment - existing utilities for the St Edmundsbury Site are shown in the site services layouts in Appendix 9.

Existing electricity (ESB) passes into the site on the southern boundary at the Dean Clinic entrance by Overhead line. It drops to underground cable in the access road. Approximately 50m into the site the electricity line emerges back onto Overhead line perpendicular to the access road and cross the agricultural field an east- west direction in the southern part of the site to enter the Lucan East 38kV Substation. The Overhead line splits to continue north within the site passing inside the west boundary through the existing woodland (pNHA). It drops into Underground cable to supply the existing Adolescent unit and the historic St Edmundsbury hospital building.

Existing telecommunication (Virgin Media) Overhead line enters the site to the west of the Dean Clinic and passes across the southern agricultural field; it passes through the existing woodland (pNHA) to supply the existing Adolescent unit.

Existing Natural Gas passes into the site underground on the southern boundary to the west of the Dean Clinic. The gas pipe passes under the access road along the eastern side of the proposed site, cuts the corner across the field then passes in a westerly direction towards the historic St Edmundsbury hospital building.

Existing sewage and potable water supplies are in place for the existing adolescent unit and the historic St Edmundsbury Hospital in the northern part of the site. There are no sewage or potable water supplies in the southern part of the site.

9.3.3 Waste management

Receiving environment - The hospital provides mental health services and there are currently no clinical procedures undertaken. Domestic waste is separated for recycling on site and removed off site by Panda Waste company

9.4 Potential Effects

9.4.1 Traffic

9.4.1.1 Construction stage

To accommodate traffic coming in and out, the removal of no.1 tree (*Chamaecyparis Lawsoniana*, Lawson Cypress) at the main entrance (Junction 1) is required as widening adjustments will be made to footpaths and kerb lines at the Deans Clinic. This entrance will be used for all services associated with the hospital and these works will facilitate access for fire tender, refuse collection, goods deliveries, vehicles/lorries.

Additionally, the main pedestrian access to the proposed development will be located at this entrance. Another route will connect to the Eastern Vehicular Access at Junction 2 via the internal roads. However, a section of this pedestrian access does not have a footpath, and pedestrians are expected to share the carriageway with motorists for 600m along the internal road.

South Dublin County Council has issued a letter of support for the development and the junction reconfiguration (junction 7) subject to conditions such as a special contribution from the applicant towards the junction upgrades. The Council will carry out the works, with the applicant transferring the required land, valued independently and deducted from the contribution. SPMHS will also demolish and rebuild part of the boundary wall (63 lin. m) along the new site line, where improvements to Junction 7 will be made.

During Construction the effects of traffic for the proposed development will require tree removal at the Dean Clinic entrance and the demolition of 63m length of wall along the southern boundary. This will have an effect for pedestrians and traffic on Lucan and Chapel Hill Roads. In particular for staff and school children in adjacent Montessori school, and users of the Private HomeCare Training centre on Chapel Hill Road who will experience disruption due to the demolition works. The impact during construction will be **Temporary, Slight, Adverse**.

9.4.1.2 Operational stage Potential Effects

Using the Transport Research Laboratory's (TRL) Priority Intersection Capacity and Delay (PICADY) and Optimised Signal Capacity and Delay (OSCADY) traffic modelling software for priority and signalised junctions, traffic capacity assessments were undertaken for Junction 1 (PICADY), Junction 3 (OSCADY), Junction 5 (OSCADY), Junction 6 (OSCADY) and Junction 7 (OSCADY).

The junctions were modelled for the 2023 Baseline Year, 2027 Opening Year and 2042 Design Year Horizon for the morning and evening peak hours.

2023 Baseline Year - Junction 1 is currently operating within the normal design threshold in both the morning and evening peak hours. However, Junction 3 and Junction 5 to Junction 7 are currently operating over the normal design threshold in both the morning and evening peak hours, resulting in queues and delays for motorists.

2027 Opening Year and 2042 Design Year - In the 2027 opening year and 2042 design year, Junction 1 will also operate within the normal design threshold in both the morning and evening peak hours for both the "without" development and "with" development scenarios.

Junction 3, and Junction 5 to Junction 7 will exceed the normal design threshold in both the morning and evening peak hours in 2027 and 2042 for both the "without" development and "with" development scenarios, resulting in queues and delays for motorists. However, the ratio of estimated net trips associated with the proposed development to the traffic flows in 2023 baseline year in the morning and evening peak hours for Junction 3, and Junction 5 to Junction 7 are also less than 3.1%, which are less than the thresholds for traffic impact assessment as stated in the Table 2.1 of TII Traffic and Transport Assessment Guidelines (i.e. 10% of the traffic flow on the existing road network and 5% in sensitive environments or where congestion exists).

Additionally, a shift working pattern will be implemented by the new hospital in order to reduce the trip generation in the morning and evening peak hours. In view of the above analysis, the proposed development will have a negligible increase in traffic volumes on Junction 3, and Junction 5 to Junction 7 so traffic from the proposed development will not have significant impact on these junctions.

In addition to estimating the net trip generation for the proposed development based on the TRICS database, another two traffic count surveys at St. Patrick's University Hospital at Dublin 8 and at Junction 1 of Lucan were undertaken on 2nd May 2024 and 21st May 2024 respectively to facilitate the estimation of the net trip generation for the proposed development.

The existing St. Patrick's University Hospital at Dublin 8 consists of 265 beds to provide services to public while the existing St. Edmundsbury Hospital at Lucan consists of 52 beds to provide services to public. After completion of the proposed development, the new hospital will increase from the existing 52 beds to a total of 214 beds. Therefore, the net trip generation for the proposed development is equal to the trip generated from the net increase of beds (i.e. 162 beds) for the proposed development.

Utilising the traffic count survey at St. Patrick's University Hospital on 2nd May 2024, expected net trip generation for the proposed development was estimated and was revealed to be in total 58 trips inbound and 21 trips outbound in the morning peak hour, and 7 trips inbound and 42 trips outbound in the evening peak hour.

Utilising the traffic count surveys at Lucan, expected net trip generation for the proposed development was estimated and was revealed to be in total 48 trips inbound and 27 trips outbound in the morning peak hour, and 21 trips inbound and 24 trips outbound in the evening peak hour.

The analysis results demonstrate that total net trip generation for the proposed development by using the TRICS database is greater than the total net trip generation by using the traffic count survey at St. Patrick's University Hospital at Dublin 8 or traffic count surveys at Lucan. It is because generally, the TRICS database provides an average data to calculate the trip generation for developments. However, using the traffic count survey at St. Patrick's University Hospital or traffic count surveys at Lucan can provide a more accurate, specific and locally based assessment.

It should be also noted that the total net trip generation for the proposed development by using the traffic count survey at St. Patrick University Hospital and traffic count surveys at Lucan are similar. The analysis also revealed that with implementation of the current measures (i.e. shift working pattern, etc.) in the Workplace Travel Plan for both St. Patrick's University Hospital at Dublin 8 and the existing St. Edmundsbury Hospital at Lucan, it can effectively reduce the net trip generation in the morning and evening peak hours when compared to the net trip generation by using the TRICS database.

After using the traffic count survey at St. Patrick's University Hospital at Dublin 8 or traffic count surveys at Lucan, the analysis results demonstrate that the impact on Junction 3, and Junction 5 to Junction 7 will be mainly due to regular background traffic growth but not the proposed development per se so traffic from the proposed development will not have significant impact on this junction.

The TTA for the proposed development was carried out in accordance with the TII Traffic and Transport Assessment Guidelines (2014). The assessment examined the net trip generation and traffic impact of the development using Traffic Count Surveys Approach methodology and Car Parking Utilisation Approach methodology.

A total of seven nearby junctions were initially examined. Based on the modelling:

- Junctions 2 to 7 were found to experience minimal additional traffic from the proposed development—well below the TII thresholds of 10% (general roads) and 5% (sensitive or congested areas).

Therefore, a full traffic impact assessments were not required for these junctions.

- Junction 1, however, was identified as exceeding those thresholds during peak times.

Therefore, a full traffic impact assessment was carried out for Junction 1.

Additionally, South Dublin County Council requested further review of Junctions 3 and 5, these were also assessed for capacity using industry-standard traffic modelling tools (PICADY and OSCADY), despite their low impact.

The anticipated car parking utilisation for the proposed development was also adopted to estimate the net hourly trip generation throughout a day for assessment. It is anticipated that the net increase of staff driving to work in daytime and night-time are 129 and 41 respectively. After consideration of the total traffic flows in 24 hours, which is equal to the 2023 background traffic flows plus net trips generation for the proposed development, the analysis results show that the highest total hourly traffic flows (i.e. 1,326) in the morning period was identified as 07:00-08:00, which is the period for night-time staff leaving the hospital. Additionally, the total hourly traffic flows (i.e. 1,326) between 07:00 and 08:00 is similar to the background traffic flows at the busiest hours (i.e. 1,316 between 09:00-10:00). It should be also noted that daytime staff will arrive the hospital between 06:00 and 07:00, which is outside the busiest hours (i.e. 07:00-10:00) of the surrounding road network in the morning period.

In the evening, the total hourly traffic flows (i.e. 1,171) between 18:00 and 19:00 (which is the period for night time staff arriving to the hospital) is higher than the total hourly traffic flows (i.e. 1,025) between 19:00 and 20:00 (which is the period for daytime staff leaving the hospital). However, the aforementioned total hourly traffic flows (i.e. 18:00-19:00 and 19:00-20:00) are also less than the background hourly traffic flows at the busiest hour (i.e. 1,402 between 17:00-18:00). It should be also noted that the daytime staff leaving the hospital between 19:00 and 20:00, which is outside the busiest hours (i.e. 16:00-19:00) in the evening period. In consideration of traffic impact during the staff shifting periods, a capacity assessment in the morning (07:00- 08:00) and evening (18:00-19:00) periods were selected for assessment.

By using the car parking utilization, expected net trip generation for the proposed development was estimated and was revealed to be in total 3 trips inbound and 43 trips outbound in the morning hour (07:00-08:00), and 43 trips inbound and 10 trips outbound in the evening hour (18:00-19:00). In the 2042 design year, Junction 1 will also operate within the normal design threshold in both the morning (07:00-08:00) and evening (18:00-19:00) hours for both the “without” development and “with” development scenarios.

Junction 3, and Junction 5 to Junction 7 will exceed the normal design threshold in both the morning (07:00- 08:00) and evening (18:00-19:00) hours in 2042 for both the “without” development and “with” development scenarios, resulting in queues and delays for motorists. Additionally, the ratio of estimated net trips associated with the proposed development to the traffic flows in 2023 in the morning (07:00-08:00) and evening (18:00- 19:00) hours for Junction 3, and Junction 5 to Junction 7 are also less than 2.3%, which are less than the thresholds for traffic impact assessment as stated in the Table 2.1 of TII Traffic and Transport Assessment Guidelines (i.e. 10% of the traffic flow on the existing road network and 5% in sensitive environments or where congestion exists).

In view of the above analysis, the proposed development will have a negligible increase in traffic volumes on Junction 3, and Junction 5 to Junction 7 in the morning (07:00-08:00) and evening (18:00-19:00) hours. The results also demonstrate that the impact on Junction 3, and Junction 5 to Junction 7 will be mainly due to regular background traffic growth but not the proposed development per se so traffic from the proposed development will not have significant impact on these junctions.

The effect of the proposed junction alterations, traffic and car parking during operation phase will be **Permanent, Not Significant, Neutral**.

9.4.2 Utilities

9.4.2.1 Construction stage Potential Effects

Proposed underground electrical cable will be laid from the access road into the site via Dean Clinic entrance to the Energy Centre located in the Historic Farm Courtyard. Existing electricity (ESB) overhead lines which cross the site in an east west direction will be diverted around the southern and western boundary linking to the Lucan East 38kV Substation. The existing overhead line on the western boundary will be ducted underground.

Proposed street lighting within the car parking areas and access road adjacent to the proposed 200-bed adult inpatient buildings will be powered from the proposed Energy Centre located in the Historic Farm Courtyard.

Proposed telecommunication cable will be installed underground around the southern and western boundary of the site. The cable will pass close to the northern boundary of the proposed 200-bed adult inpatient building and will pass through the pNHA woodland in a northerly direction within the existing cable duct to minimise the requirement to disturb the woodland bed.

Proposed Natural Gas pipeline route will remain largely in its current alignment apart from a short diversion in the northeastern corner of the proposed development to pass around the proposed pond and woodland area.

Proposed storm and foul sewers will be installed around the external walls of the 200-bed adult inpatient building then following the route of the access road at the eastern boundary with St. Andrews School, connecting with existing storm/foul sewers and watermain at R835, Lucan Road. The foul sewer is proposed to start at the northern wall of the 200-bed adult building, the storm sewer begins at the eastern wall, both sewers start south of the pNHA Woodland area and be within a combined 5m wide utility trench including a tree root barrier. Discharge of wastewater will be through a connection to foul sewer network at R835 Lucan Road.

Proposed watermain will be a 150mm diam HDPE pipe it will follow the same route as the sewers along the southern and eastern walls of the 200-bed building, also the pipe is proposed to continue around the northern section of the wall and around the pNHA woodland to avoid disruption of the woodland area. The pipe continues around the barn and coach house building to rejoin the main building at the western wall, it exits out through the access road and will connect to the existing watermain at R835, Lucan Road. Confirmation of Feasibility has been received from Uisce Eireann that confirms their system has capacity to cater for the proposed development without upgrades to their infrastructure.

Beneath each proposed carpark there will be proposed Stormtech MC3500 detention/infiltration systems with storage capacity of 952m³ in the southern carpark and 1422m³ at the north-eastern carpark. Between the carparks there will be the bio retention area.

During construction, the installation of the proposed combined underground utility trench for water mains, surface and foul sewers (approx 5m in width) at the northern wall of the 200-bed adult facility will have a temporary impact on the trees, and understory planting at the southern fringe of the woodland area. Trees within the southern fringe have to be removed to facilitate the construction of the building and the utilities. The detention/infiltration systems under car parks will have a constraint on tree planting in the vicinity.

During Construction the effects of the installation of proposed utilities will have a **Temporary, Moderate, Adverse** effect due to the impact on the sensitive pNHA woodland.

9.4.2.2 Operational stage Potential Effects

Once the proposed development is operational, no impacts to utilities are expected to occur. The operational effect on utilities will therefore be **Permanent, Imperceptible, Neutral**.

9.4.3 Waste

9.4.3.1 Potential Effects - Construction stage waste

The existing adolescent ward in the northern part of the site is to be demolished. Approximately 7900 cub m of waste will be generated and removed off site, resulting in approximately 500 No. trips based on 15 cub m truck size.

Additionally, the southern boundary wall (approx 63 lin.m) at the Lucan Road junction will be removed for the proposed junction configuration.

The general construction waste will be collected, segregated, and disposed of by licensed waste contractors.

The facing stone will be retained on site to clad the proposed realigned wall; surplus concrete will be removed off site

During construction the effect of the proposed development on waste will be **Temporary, Slight, Adverse**.

9.4.3.2 Operational stage waste

Domestic waste generated from buildings in the north and south will not be clinical waste, domestic waste only. This will be separated to allow for recycling and handled by the existing waste company.

During the operational stage the effect of the proposed development on waste will be **Permanent, Imperceptible, Neutral**.

9.5 Mitigation Measures

9.5.1 Traffic

9.5.1.1 Construction Phase

The duration of the construction phase and the resource level and trips associated with the construction stage will be decided by the Contractor in accordance with contractual restrictions and may fluctuate depending on the sequence and type of work being carried out at any one time. During construction, trucks and vans will be delivering materials to the site on a daily basis. It is estimated that the arrivals of deliveries to the site are expected to be evenly spread throughout the day.

A Construction Stage Traffic Management Plan will be developed and agreed with South Dublin County Council prior to undertaking any construction works and full consultation with South Dublin County Council, An Garda Síochána, the Fire Service, the Ambulance service and other relevant same stakeholders will be carried out. All traffic management plans, including working times, shall be agreed with and approved by South Dublin County Council Transportation Department in advance of implementation. A Construction Manager shall be appointed to liaise directly with the various sections of the Council.

The construction management plan will take into account construction vehicle routing and timing to mitigate any issues with vehicles on public roads. The following provisions will be provided to minimize the impacts to the public road network during Construction Stage:

- Tracked excavators will be moved to and from the site on low-loaders and will not be permitted to drive on the street pavements;
- Wheel washers / judder bars will be placed at all site access points to minimise the migration of detritus onto the public roads. The roads will be inspected and cleaned on a regular basis; and
- Haul vehicles will be covered after loading to ensure there is no risk of construction material falling.

- Demolition of part of the existing boundary wall (63 lin.m) at junction 7 Chapel Hill / Lucan Road will be carried out from within the grounds of the proposed development to minimise impact on the adjacent public road and footpath.

9.5.1.2 Operational Phase

During the Operational phase the future development traffic will mirror existing travel flows when exiting and entering the development.

The new hospital will employ a Workplace Travel Coordinator, who will prepare the Mobility Management Plan to supervise the use of private cars on Site and that opportunities for employees/visitors to use alternative modes of transport (i.e. walking, cycling and public transport) are maximised. These alternatives will include:

Sustainable travel:

- Provide shuttle bus services for staff between the existing hospital at Dublin 8 and the proposed development;
- Provide parking spaces at the existing Dublin 8 hospital for staff availing of the above-mentioned shuttle bus services;
- Implement paid parking for visitors to encourage use of public transport;
- Encourage appointment times and visitor times to coincide with maximum public bus availability.

Mitigation by Design:

- Three signalised pedestrian crossings at Lucan Road East, Lucan Road West, and Chapel Hill, removing the need for pedestrians to wait on a small island and improving safety for vulnerable road users.
- The bus stop on Lucan Road East will be relocated approximately 80 metres west to prevent obstruction to vehicles turning onto Chapel Hill.
- The proposed design also ties into future cycle routes and includes active travel facilities that partially comply with the Cycle Design Manual, contributing to improved safety for cyclists and pedestrians.
- Junction 7 – Improvement Scheme (Lucan Road / Chapel Hill):

Although not requiring a full assessment, Junction 7 was flagged by South Dublin County Council (SDCC) as a location of concern. In response, it was agreed that the applicant would cede an area of their site along the Lucan Road boundary to SDCC, to facilitate the construction of a junction improvement scheme at Junction 7. Enabling SDCC to deliver a junction improvement scheme, incorporating a modal shift approach to prioritise sustainable transport modes. The layout shown in Figure 9-2 below was agreed.



Figure 9-2: Preferred option of proposed improvement scheme for Lucan road /

Chapel Hill junction

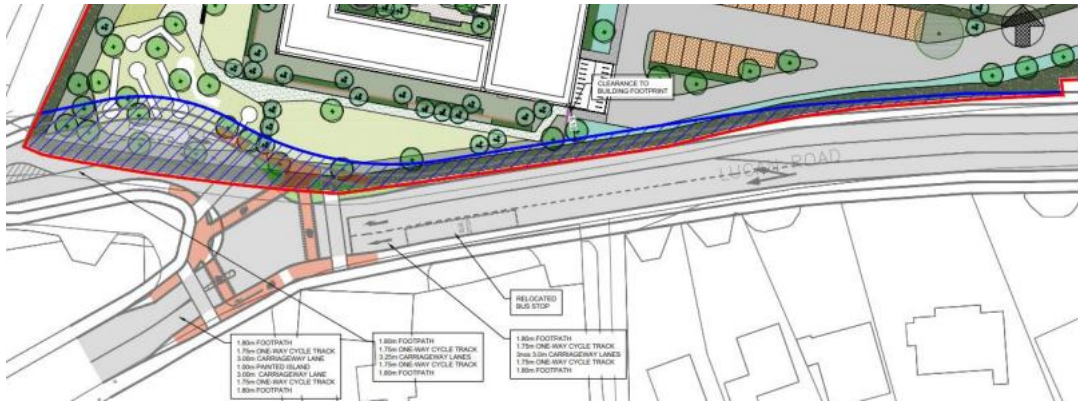


Figure 9-3: Proposed applicants site area to be taken-in-charge by south Dublin County council for Lucan Road/Chapel Hill junction improvement scheme

9.5.2 Utilities

The combined 5m wide utility trench will include a tree root barrier on the northern side to prevent damage to utilities from proposed compensation woodland planting in the pNHA. Installation of sewers will be in accordance with the 'Greater Dublin Regional Code of Practice for Drainage Works' version 6.0. These procedures will guarantee that residents affected by relocation of utilities will be given ample notice before construction starts.

9.5.3 Waste

A Construction Waste Management Plan will be produced by the appointed contractor to mitigate impacts on the surrounding roads from the transfer of building waste, excess inert soils and sub-soils. Due to the potential for transfer of non-native invasive species, biosecurity measures will be put in place.

A site-specific Construction Environmental Management Plan (CEMP) will be prepared by the appointed contractor in advance of the works. This will be agreed with South Dublin County Council and An Garda Síochána.

9.6 Monitoring

No ongoing monitoring is considered necessary.

9.7 Residual Impacts

9.7.1 Traffic

9.7.1.1 Construction stage

The implementation of the Construction Traffic Management Plan to take into account construction vehicle routing and timing will mitigate any issues with vehicles on public roads. The residual impact will be **Temporary, Not Significant, Adverse**.

9.7.1.2 Operational stage

The Mobility Management Plan will be implemented by the Workplace Travel Coordinator during the operational stage supervise. This will ensure that the use of alternative modes of transport (i.e. walking, cycling and public transport are maximised. The residual effects will be **Permanent, Imperceptible, Neutral**.

9.7.2 Utilities

9.7.2.1 Construction stage

Mitigation measures will reduce the effect of the proposed development however, there are some impacts that cannot be avoided in the short term, such as short-term inconvenience of water main, foul sewer, or ESB stoppages for several hours during the connection of services. Residents will receive notices when stoppages are foreseen. Additionally, the impact on the southern fringe of the pNHA during the construction of the combined utility trench cannot be mitigated. However the planting of compensation woodland in the northeastern part of the site will mitigate tree loss, plus the installation of a tree root barrier in the utility trench will limit the future need to remove any trees. The residual impact will be **Temporary, Not Significant, Adverse**.

9.7.2.2 Operational stage

No operational impacts from utilities are expected to occur and no mitigation is necessary. The residual impact will be **Permanent, Imperceptible, Neutral**.

9.7.3 Waste

9.7.3.1 Construction stage

The construction management plan will take into account construction vehicles and mitigate against any issues with vehicles on public roads, minimizing the impacts to the public road network during construction stage. The residual impact will be **Permanent, Imperceptible, Neutral**.

9.7.3.2 Operational stage

No operational impacts from waste are expected to occur and no mitigation is necessary. The residual impact will be **Permanent, Imperceptible, Neutral**.

9.8 Interactions

9.8.1 Traffic

Construction vehicles moving on site during the construction phase will result in hydrocarbons entering the surface water drainage system, leading to effects downstream. This is mitigated against by measures included in the CEMP, which outline the site compound location (away from any drains) and require all vehicles to be maintained frequently and to carry spill kits at all times. Without mitigation in place, this could lead to a temporary significant negative effect. However, with the measures outlined in this chapter and the CEMP, the interaction between these will be **Temporary, Imperceptible, Neutral**.

The construction of a part two, part three storey post primary school extension at Saint Joseph's College and the construction of 7 two storey 5 bedroom houses, comprising of 3 detached houses and 4 semi-detached houses at Clonbrone, Lucan Newlands Road, Esker Hill, Lucan. These developments will result in additional construction traffic on the Lucan Road.

9.8.2 Utilities

Due to the design of surface and stormwater drainage being in accordance with SuDS and the Greater Dublin Strategic Drainage Study, any interaction between material assets and water will be **Long-term, Imperceptible, Neutral**. Localised disruption of utilities will be during the connection of services.

9.8.3 Waste

Demolition of existing single and two storey post primary school buildings at Saint Joseph's College and the demolition of an existing two storey detached dwelling with associated out-buildings at Clonbrone, Lucan Newlands Road, Esker Hill, Lucan will create additional waste

during the construction phase, during the operational phase the waste generated will be domestic.

9.9 Potential Cumulative Impacts

There are several other recent developments and planning applications in the vicinity of the proposed project. Larger development planning applications in the near vicinity from the last three years are included. Applications for home extensions, internal alterations and retention are not considered. The developments are; Saint Joseph's College, Post Primary School and Soil Mhuire Girls National School, Lucan Road, Lucan, Co. Dublin and Clonbrone, Lucan Newlands Road, Esker Hill, Lucan, Co. Dublin.

9.10 Difficulties encountered in compiling this Information

No difficulties encountered during the course of this assessment.

10 Cultural Heritage: Archaeology and Architectural Heritage

10.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) assesses the potential effects of the proposed development at St. Edmundsbury Hospital, Lucan Road, Lucan, Co. Dublin on the cultural heritage resource of the site and its immediate surroundings. For the purposes of this chapter, cultural heritage includes architectural heritage, historic structures and their attendant grounds and curtilage, together with the wider historic landscape associated with the St. Edmundsbury estate and hospital campus.

The application site comprises approximately 7.03 hectares within the existing St. Edmundsbury Hospital grounds. The site contains a number of structures included in the Record of Protected Structures (RPS) under the South Dublin County Development Plan. These include St. Edmundsbury House (RPS Ref. 003), the coach house and associated farmyard buildings (RPS Ref. 008), the stable block (RPS Ref. 010), the walled garden (RPS Ref. 012), the boundary wall with bell tower (RPS Ref. 013), and associated stone boundary walls and entrance structures (RPS Ref. 028).

St. Edmundsbury originated as an eighteenth-century country estate and was later incorporated into the St. Patrick's Hospital campus following its acquisition in 1898. The site therefore retains elements of both its eighteenth-century demesne layout and its subsequent institutional development as a mental health facility.

The proposed development forms part of a wider expansion of mental health services at the site and includes the construction of new hospital buildings, the demolition of certain existing structures, and the refurbishment and adaptive reuse of historic buildings within the St. Edmundsbury campus.

This chapter describes the existing cultural heritage resource within the site, assesses the potential impacts of the proposed development during both the construction and operational phases, and identifies mitigation measures designed to minimise negative effects on protected structures and other heritage assets.

10.2 Assessment Methodology

This Cultural Heritage assessment has been prepared in accordance with the Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022). The assessment adopts a structured and systematic methodology to identify, describe and evaluate the likely significant effects of the proposed development on cultural heritage.

For the purposes of this chapter, cultural heritage includes:

- architectural heritage (protected structures and other buildings of heritage interest),
- historic landscapes and designed settings,
- archaeological resources (known and potential), and
- intangible cultural associations where relevant.

The assessment considers:

- direct impacts, including demolition, alteration and physical intervention in historic fabric;
- indirect impacts, including changes to setting, character, spatial relationships and visual context; and
- cumulative impacts, where relevant, arising from interaction with other developments.

The assessment is undertaken for:

- the construction phase (including enabling works and ground disturbance),
- the operational phase, and
- the do-nothing scenario, as required under EIAR guidance.

10.2.1 Sources of Information and Surveys

The assessment is informed by a combination of field survey, documentary research and specialist inputs. The principal sources include:

- Site inspections undertaken by Carrig Conservation (August 2023), including visual inspection of all structures and spaces within the site.

Statutory records including:

- Record of Protected Structures (RPS), South Dublin County Development Plan 2022–2028;
- National Inventory of Architectural Heritage (NIAH), including reference numbers and ratings;
- Record of Monuments and Places (RMP), where applicable.
- Historic cartographic sources and archival material relating to the development of the St. Edmundsbury estate.
- Planning records and documentation provided by the design team.

Conservation documentation prepared by Carrig Conservation, including:

Volume 1: Architectural Inventory, Condition Survey and Appraisal;

Volume 2: Conservation Repair Methodology and Specification;

Volume 3: Architectural Heritage Impact Assessment (AHIA) (Appendix 10.1).

Archaeological assessment prepared by Aisling Collins Archaeology Services (ACAS), including archaeological inspection and monitoring of engineering site investigations (Appendix 10.1).

The conservation reports provide detailed information on the architectural character, condition and significance of the protected structures and associated features, and form the evidential basis for the assessment of impacts and mitigation measures set out in this chapter.

10.2.2 General Approach

The assessment of impacts on cultural heritage is based on the interaction between:

- the sensitivity (or importance) of the heritage asset, and
- the magnitude of change arising from the proposed development.

The significance of effect is derived from this interaction in accordance with the methodology set out in the EPA Guidelines (2022).

Impacts are assessed prior to mitigation (worst-case scenario) and following the application of mitigation measures (residual impact).

10.2.3 Sensitivity of Heritage Assets

The sensitivity of a heritage asset reflects its relative importance and is informed by:

- statutory designation (e.g. RPS, NIAH rating),
- architectural, historical and cultural significance,
- group value and contribution to a wider ensemble,
- integrity and survival of historic fabric.

Sensitivity is categorised as follows:

Sensitivity	Description
Very High	Internationally or nationally important heritage assets (e.g. protected structures of exceptional significance, nationally important archaeological remains)
High	Regionally important heritage assets, including protected structures and NIAH structures of regional significance
Medium	Locally important heritage assets, including non-designated structures of architectural or historic interest
Low	Features of limited heritage value or heavily altered fabric

10.2.4 Magnitude of Impact

The magnitude of impact reflects the scale and nature of change arising from the proposed development, having regard to:

- extent of loss of historic fabric,
- degree of alteration to character or form,
- impact on setting and spatial relationships,
- reversibility of the intervention,
- duration of the effect (temporary or permanent).

Magnitude is categorised as follows:

Magnitude	Description
Profound	Total loss or complete alteration of a heritage asset or its setting
Major	Significant loss or substantial alteration affecting key characteristics
Moderate	Partial loss or noticeable alteration to character or setting
Slight	Minor alteration with limited effect on heritage value
Negligible	Minimal or no discernible change

10.2.5 Significance of Effects

The significance of effects is determined by combining sensitivity and magnitude in accordance with EPA Guidelines. Effects are classified using the following terminology:

Significant Adverse Effect

- Moderate Adverse Effect
- Slight Adverse Effect
- Neutral Effect
- Slight Positive Effect
- Moderate Positive Effect
- Significant Positive Effect

Each effect is further characterised in terms of:

- quality (positive / adverse / neutral),
- duration (temporary, short-term, long-term, permanent), and
- extent (site-specific, local, regional).
- The final classification is expressed in EPA format, for example:
- Permanent, Moderate, Adverse Effect

10.2.6 Types of Effects Considered

The assessment considers:

- Direct effects: physical impacts on heritage fabric (demolition, alteration, excavation);
- Indirect effects: impacts on setting, views, character and spatial relationships;
- Cumulative effects: interaction with other developments in the vicinity;
- Do-nothing scenario effects: likely evolution of the site in the absence of development.

10.2.7 Mitigation and Residual Impact Assessment

Mitigation measures are identified to:

- avoid impacts where possible,
- reduce the magnitude of impacts, and
- offset or compensate for unavoidable effects.

Mitigation measures are:

- specific to identified impacts,
- informed by conservation best practice, and
- based on the Conservation Repair Methodology and Specification prepared for the project (See Appendix 10)
- Residual impacts represent the effects remaining after mitigation has been applied and are assessed using the same methodology outlined above.

10.2.8 Limitations

This assessment is based on:

- visual inspection of accessible areas,
- documentary research and available survey information, and
- design information provided at the time of writing.

No intrusive investigation of built fabric was undertaken as part of this assessment. Archaeological findings are based on preliminary, unlicensed monitoring of site investigations and therefore represent an initial assessment of subsurface potential.

Where detailed design development occurs, particularly in relation to junction detailing, structural interfaces or conservation methodologies, further refinement of assessment may be required.

10.3 Receiving Environment

The site comprises the grounds and premises of the existing St. Edmundsbury Hospital campus and extends across a landscaped institutional site historically associated with St. Patrick's Hospital. The campus contains a number of historic structures and landscape features associated with the former demesne and its later institutional use.

The site retains elements of its historic estate character including outbuildings, boundary walls, garden structures and mature planting.

The location of all protected structures and recorded heritage assets is illustrated in Figure 10-1 & Figure 10-2 (Heritage Constraints Plan). This figure identifies all RPS-designated structures and National Inventory of Architectural Heritage (NIAH) entries within the site.

South Dublin County Development Plan 2022-2028

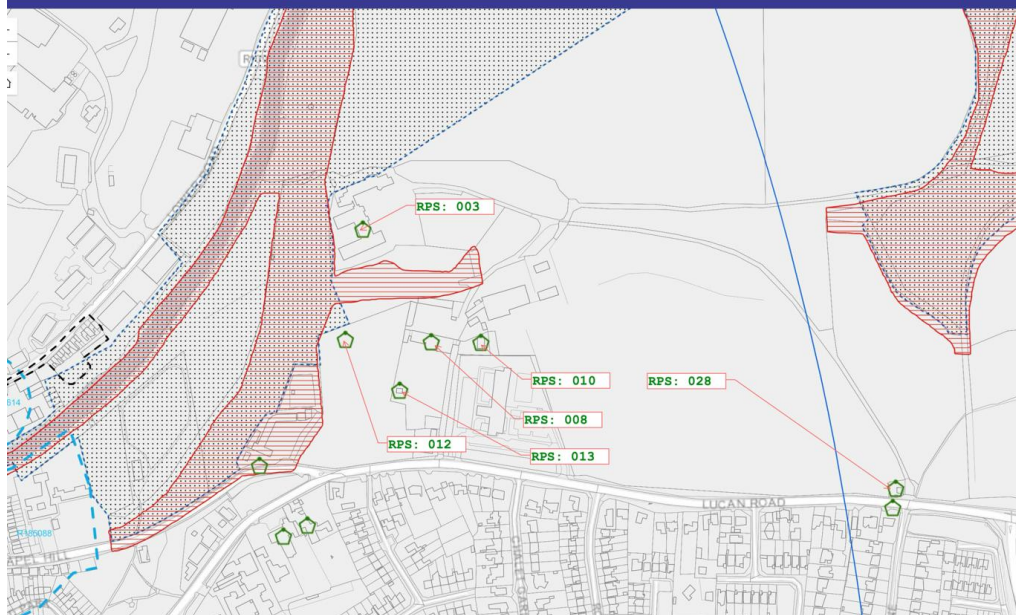


Figure 10-1 South Dublin County Council Development Plan 2022 - 2028 Record of Protected Structures

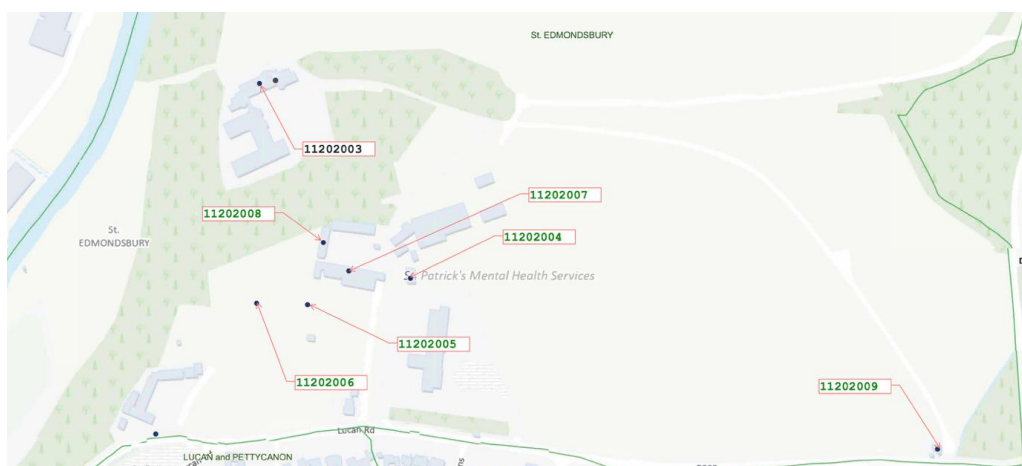


Figure 10-2 NIAH - Historic Environment Viewer - NIAH numbers in vicinity of the site.



Figure 10-3 Site overview

10.3.1 Protected Structures

The St. Edmundsbury Hospital campus contains a number of structures included in the Record of Protected Structures (RPS) under the South Dublin County Development Plan 2022–2028. These protected structures form part of the historic estate and institutional complex associated with the development of the site.

The protected structures located within the application site include:

Structure	Description	RPS Reference
St. Edmundsbury House	Three Storey House, Porch with Colonnades, & Out- offices	003
Coach House / Farmyard Buildings	Barn & Coach House	008
Stable Block within the historic Farmyard Enclosure	Detached Two-Bay Two-Storey House & Stable Block	010
Walled Garden	Walled Garden	012
Boundary Wall with Bell Tower	Uncoursed Rubble Limestone Boundary Wall with Attached Bell Tower	013
Stone Boundary Walls and Associated Entrance Structures	Gate Lodge, Pillars & Gates	028

These structures collectively form part of the historic estate layout associated with St. Edmundsbury and contribute to the architectural and historic character of the site. The protected structures include the principal country house building together with associated service buildings, garden structures and boundary features which formed part of the historic demesne and later institutional campus.

The protection afforded under the Record of Protected Structures extends not only to the structures themselves but also to their interiors, curtilage and attendant grounds, where these contribute to the architectural or historic interest of the protected structures.

10.3.1.1 Historical Development of the Site

St. Edmundsbury lands were transferred from Amongdisham Vesey, Member of Parliament for Harristown, Accountant and Controller General of Ireland, and an amateur architect, to Edmund Sexton Pery in 1766⁴. St. Edmundsbury House is understood to have been constructed by Edmund Sexton Pery in the latter part of the eighteenth century⁵.

The National Inventory of Architectural Heritage (NIAH) suggests a construction date of between 1730 and 1750; ⁶however, this is not supported by available cartographic evidence. The house does not appear on Rocque's map of 1760 (Figure 10-6), whereas the 1772 survey of the estate of Amongdisham Vesey (Figure 10-7) clearly identifies St. Edmundsbury House and the associated coach house. On this basis, it is reasonable to conclude that St. Edmundsbury House was constructed between 1760 and 1772.

In 1852, the property was offered for sale or rental. Contemporary descriptions note that:

"Upwards of £20,000 have been expended on this elegant Mansion, Offices, Farmyards, Conservatories and Gardens. The Mansion House consists of three storeys, and contains all the requisites of the residence of a nobleman or country gentleman, including Library, Billiard-room etc. There is a bath on this division at a short distance from the Mansion House. The farm-yard, comprising Offices, Stables etc., is equaled by few, and the Gardens and Conservatories, with the parterres and shrubberies, cannot fail to gratify and delight."

St. Edmundsbury was offered for auction on behalf of its owner, Thomas Richard Needham. Apart from a parcel of land sold to Walter Berwick for £360, the estate was withdrawn from auction, although Berwick subsequently acquired the remainder of the estate. The property then passed through a number of owners, during which time alterations were carried out, as outlined in Section 2.2 (Construction Chronology).

In 1746, a 'private asylum for the insane', St. Patrick's Hospital, was established in Dublin through a bequest by Dean Jonathan Swift. The institution expanded during the nineteenth century and, in 1898, acquired St. Edmundsbury as a country branch hospital. Elizabeth Malcolm notes in Swift's Hospital that Swift would likely have been familiar with the site through his association with the Vesey family.

Following its acquisition, St. Edmundsbury House was initially used to accommodate approximately 15 female patients. The Irish Photo Archive records that the surrounding lands were actively farmed, producing food for the main hospital and generating income through the sale of surplus produce.

There are some inconsistencies in the dating of associated structures. The NIAH dates the Coach House to between 1860 and 1900; however, its presence on the 1772 estate survey indicates that it was constructed in the eighteenth century. Similarly, the Barn is dated by the NIAH to between 1850 and 1890.

⁴ Registry of Deeds, Memorial No. 161756, p. 162.

⁵ Malcolm, E., Swift's Hospital: A History of St. Patrick's Hospital, Dublin, Gill and Macmillan Ltd., 1989, p. 199

⁶ NIAH website, Accessed 29th September 2023, available in: <https://www.buildingsofireland.ie/buildings-search/building/11202003/st-edmondsbury-hospital-st-edmondsbury-co-dublin>

The walled garden is attributed by the NIAH to the period 1800–1850, while the boundary wall and attached bell tower are dated to between 1800 and 1860, with the suggestion that the bell tower itself may be of earlier, possibly medieval origin. However, the 1772 survey shows the garden walls in their present configuration. Taken together with the NIAH assessment, this suggests that the walls likely date from the late eighteenth century, with later modifications.

In its early use as part of St. Patrick's Hospital, St. Edmundsbury House functioned primarily as a convalescent facility. A single-storey ward wing was subsequently added to the south of the house in 1985.



ST. EDMUNDSBURY HOUSE

Figure 10-4 South elevation of St. Edmundsbury House in 1928. At that time St. Edmundsbury House was the ladies' hospital. Source: Booklet published by St. Patrick's Hospital in 1928



Figure 10-5 Photograph dated from 15th July 1958. It shows a former greenhouse in St. Edmundsbury complex. Source: Lensmen Collection, Irish Photo Archive.

10.3.2 Architectural Heritage Resource

The principal heritage assets within the site comprise St. Edmundsbury House and its associated service buildings including the barn, coach house, boundary walls and walled garden.

These structures collectively reflect the historical development of the site from an eighteenth-century country estate to a twentieth-century institutional campus.

St. Edmundsbury House represents the principal historic building on the site and retains elements of its original Georgian architectural character. The associated outbuildings and garden structures form part of the historic curtilage of the estate and contribute to the overall historic character of the site.

10.3.2.1 Cartographic Analysis

The following outlines the evolution of the site through cartographic analysis.



Figure 10-6 The 1760 Rocque Map. St. Edmundsbury House is not indicated. The approximate location of St. Edmundsbury Hospital site is shown as fields and marked in red. Source: Dublin Historic Maps.



Figure 10-7 1772 Survey of Estate of Amongdisham Vesey overlaid with the red mark of current St. Edmundsbury House outline.

St. Edmundsbury House appears on the map with the outbuildings: the Coach House is built to southeast part. There are 2 no. separate buildings where the barn is currently located today. Buildings that are no longer in existence: 2 no. buildings to the north of the Coach House, 2 no. outbuildings to the south of the Coach House, 3 no. buildings attached to the boundary wall and bell tower, 1 no. building attached to the north garden wall. The north, west, east, south section of the walled garden and bell tower appear in their present-day locations. Source: 1772 Survey of Estate of Agmondisham Vesey⁷

⁷ Bernard Scale, 1772 Survey of the estate of Agmondisham Vesey

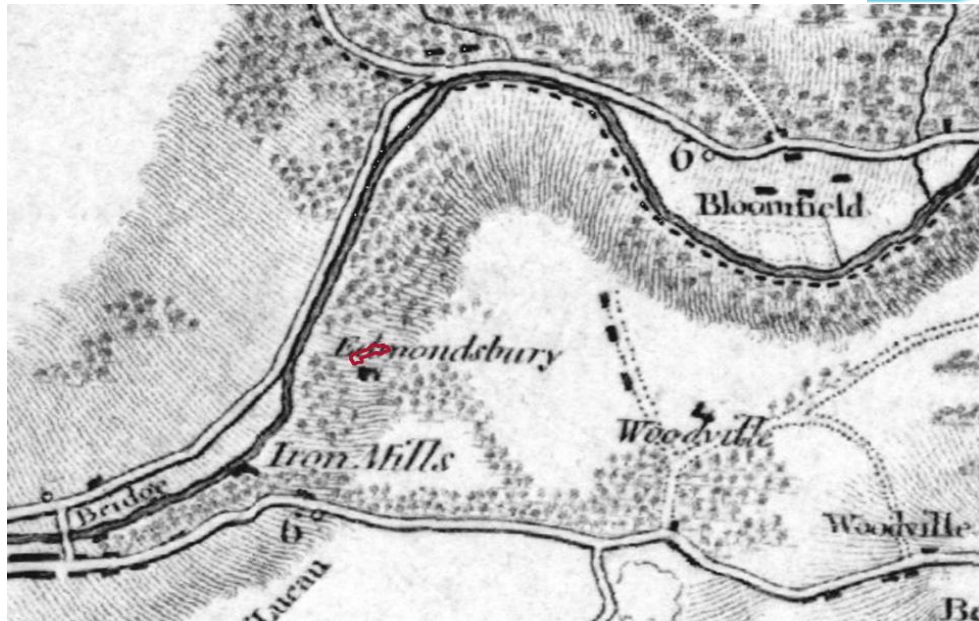


Figure 10-8 The 1816 Taylor South Map overlaid with red mark of current St. Ed's outline.

St. Edmundsbury House appears in the approximate location of where we see the house today, to the east of the river Liffey before the Iron Mills. The outbuildings that appear in the 1772 Survey of Estate of Amongdisham Vesey are not shown. Source: South Dublin Historical Mapping⁸

⁸ South Dublin Historical Mapping. Accessed 29th September, available in: <https://sdublincoco.maps.arcgis.com/apps/webappviewer/index.html?id=e0c5595b033341dea7661e248d2e9ee9//>

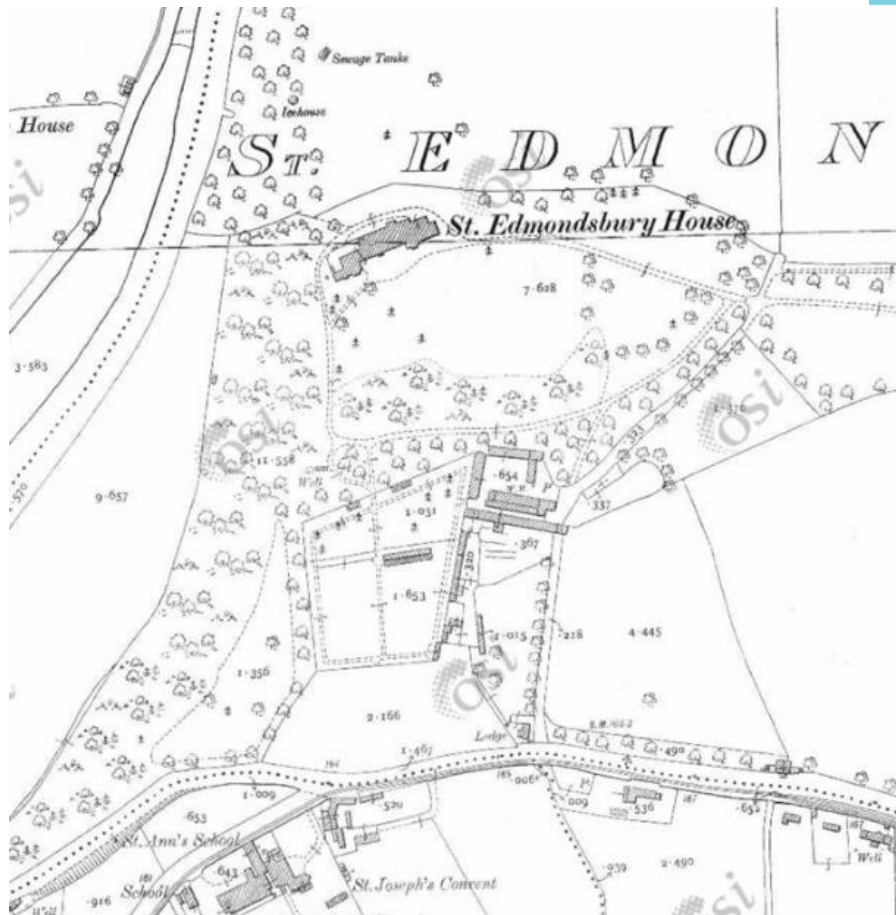


Figure 10-9 The Ordnance Survey 25-inch mapping indicates the presence of two-storey wings to either side of St. Edmundsbury House.

The east wing appears to have been added in the late nineteenth century, while the west wing was constructed between 1907 and 1913. The mapping also records a structure within the garden area and two additional buildings located to the south of the north wall of the walled garden. These structures are no longer extant. Source: GeoHive Map Viewer⁹

10.3.2.2 Statement of Significance

The St. Edmundsbury Hospital campus represents a historically layered site which retains elements of its eighteenth-century origins as a country estate together with later institutional development associated with the expansion of mental health services in Ireland.

The principal structure on the site, St. Edmundsbury House, is a late eighteenth-century country house constructed following the transfer of the lands to Edmund Sexton Pery in the latter part of the eighteenth century. The house forms the architectural focus of the site and retains elements of its historic Georgian character. Its later adaptation for use as part of the St. Patrick's Hospital campus reflects an important phase in the history of psychiatric care in Ireland.

Associated structures within the site, including the coach house, stable block and other buildings within the historic farmyard enclosure, illustrate the service and agricultural functions historically required to support the operation of the estate. The walled garden and boundary wall with bell tower represent important elements of the historic demesne landscape and contribute to the overall historic character of the site.

⁹ GeoHive Map Viewer. Accessed 29th September, available in: <https://webapps.geohive.ie/mapviewer/index.html>

The network of stone boundary walls, entrance structures and garden enclosures further reinforces the historic layout of the estate and forms an important part of the architectural and landscape setting of the protected structures.

Collectively, the protected structures and associated landscape features contribute to the architectural, historical and social significance of the St. Edmundsbury site. The campus illustrates the transition of the estate from a private country residence to a long-standing institutional facility providing mental health services, while retaining a number of architectural and landscape elements which reflect the earlier demesne layout.

10.3.3 Archaeology

Archaeological inspection of engineering site investigations undertaken in October 2023 identified a limited number of subsurface features across the site. These comprised:

- a stone-lined drain and wall feature identified in Test Pit 13
- a cobbled surface identified in Test Pit 14
- culverts and drainage features identified in Test Pit 1 and adjacent locations

The identified features are of post-medieval to early modern date and are associated with the historic agricultural and estate use of the site.

Artefacts recovered during the investigation included fragments of 18th–19th century pottery and construction materials, further confirming activity associated with the historic development of the estate.

No significant archaeological deposits or features of earlier date were identified during the investigation.

The archaeological evidence indicates that the site has been subject to agricultural use and later estate development, with surviving subsurface features relating primarily to this phase of activity.

On this basis, the archaeological resource within the site is characterised as being of low to moderate significance, comprising predominantly post-medieval features of local importance.

10.3.4 Appraisal of Structures Within The Site

The complex comprises a group of interrelated structures set within a mature, landscaped setting. These include St. Edmundsbury House, the Barn, the Coach House, the Farm Building, the Boundary Wall with Bell Tower, and the Walled Garden. Collectively, these elements form a coherent historic ensemble reflecting both the original demesne layout and its later institutional use.

St. Edmundsbury House is a late eighteenth-century country house situated within landscaped grounds and accompanied by associated outbuildings. The building has been extended and altered over time by successive owners, resulting in a layered architectural character. This is evident in both internal and external features, including the eighteenth-century square-headed windows with bossed surrounds to the north elevation, the nineteenth-century projecting Doric entrance portico, the late nineteenth-century west wing, and the twentieth-century east wing, which replicates the earlier addition. Internally, features of note include the brick-vaulted cellar at basement level and decorative nineteenth-century plasterwork with vegetal motifs within the principal rooms.

The site is historically associated with Amongdisham Vesey, Member of Parliament for Harristown, Accountant and Controller General of Ireland, and an amateur architect, who designed his own residence at nearby Lucan House. Ownership of the lands transferred from Vesey to Edmund Sexton Pery in 1766¹⁰, following which the house was constructed.

¹⁰ Dictionary of Irish Architects 1720 -1940 website, Accessed 15th November 2023, available in: <https://www.dia.ie/architects/view/5435/vesey-agmondisham>

Following its acquisition in 1898, St. Edmundsbury was incorporated into the St. Patrick's Hospital estate and adapted for use as a country branch hospital¹¹. This represented a progressive approach to the treatment of mental illness, whereby patients were accommodated in a domestic, landscaped environment rather than in purpose-built institutional facilities. The selection of St. Edmundsbury House and its grounds was intended to provide a high standard of care, with the surrounding lands contributing to the provision of fresh food and supporting a degree of self-sufficiency.

The St. Edmundsbury complex represents an unusual and relatively rare example of the adaptation of a country house and its demesne for psychiatric care. In contrast, most psychiatric facilities of the period were purpose-built. A later comparable example is Harristown House, Ballinasloe, which was acquired in 1932 for use as a district mental hospital¹².

The various elements of the St. Edmundsbury complex — including the Barn, Coach House, Farm Buildings, Walled Garden, and Boundary Wall with Bell Tower — are intrinsically linked and cannot be considered in isolation. These structures formed part of the operational and agricultural infrastructure of the estate and later the hospital, supporting both patient care and institutional self-sufficiency. The grounds and associated buildings facilitated food production, contributed to the therapeutic environment, and generated income through the sale of surplus produce.

The boundary wall and bell tower are important components of this wider complex and contribute significantly to the character and historic legibility of the site. Together with the surviving agricultural and garden structures, they provide evidence of the scale and organisation of the former estate and its later institutional use. Such an integrated ensemble is uncommon within a suburban context and is of particular architectural and historical interest

10.3.5 Description of the proposed development relative to Cultural Heritage

The proposed development includes a number of works affecting protected structures and historic landscape features within the St. Edmundsbury campus. These works include the alteration and adaptive reuse of buildings within the historic farmyard enclosure, interventions to the protected walled garden structures, incorporation of elements of the historic boundary wall and bell tower within the new hospital building, and the relocation of a section of the historic boundary wall along Lucan Road. These works form the principal elements of the development relevant to the architectural heritage assessment.

The principal element of the development is the construction of a new 200-bed adult in-patient mental health hospital building, arranged as a one-to-two storey structure located largely within the area of the historic walled garden. The building will accommodate seven patient wards within a continuous building block to provide secure outdoor amenity space for patients.

Elements of the historic garden walls and bell tower will be incorporated into the overall design of the new hospital building, while sections of the existing garden wall structures will be removed where required to facilitate the development.

The development also includes the demolition of an existing single-storey psychiatric ward building located to the south-west of St. Edmundsbury House, and the construction in its place of a new 14-bed adolescent in-patient mental health facility. Works to St. Edmundsbury House will also include façade remediation at the point where the existing ward building connects to the protected structure.

Within the historic farmyard enclosure, the proposed development provides for the refurbishment, alteration and change of use of existing buildings. The coach house building will be converted to accommodate a consultancy suite together with a coffee shop facility. The stable block will be refurbished and adapted to provide a maintenance facility building and associated office accommodation. Additional works within this area include the demolition of

¹¹ Page 21, 1928 Booklet, St. Patrick's Hospital

¹²

an existing shed and the construction of a new energy centre building, together with associated service structures including a secure bicycle store.

The proposed development further includes the demolition of several non-historic structures within the site, including two Dean Clinic buildings located near the existing entrance from Lucan Road, together with other ancillary sheds and buildings within the farmyard enclosure and walled garden areas. These demolitions will facilitate revised access arrangements to the site and the wider redevelopment of the campus.

Alterations to the site boundary are also proposed, including the removal and relocation of a section of the southern boundary wall along Lucan Road, set back from the existing boundary to allow for future junction improvements at the Lucan Road and Chapel Hill junction. The junction works themselves do not form part of the present application.

In addition to the principal buildings described above, the development includes a range of associated site development works including new internal roads and pedestrian routes, revised access arrangements, car and cycle parking facilities, public and secure patient gardens, open space provision, landscaping works, boundary treatments, drainage and Sustainable Urban Drainage Systems (SuDS), plant and service infrastructure, energy and utility installations, ESB substations, attenuation tanks, rainwater harvesting infrastructure, photovoltaic panels, and other associated works required for the functioning of the hospital campus.

10.4 Potential Effects

This section assesses the likely significant effects of the proposed development on cultural heritage during both the construction and operational phases.

Effects are identified and assessed prior to mitigation (worst-case scenario), and classified in terms of:

- sensitivity of the receptor,
- magnitude of impact,
- duration, and
- resulting significance of effect.

10.4.1 Sensitivity of Receptors

The sensitivity ratings applied in this section are derived from the statutory designations and statement of significance. In summary:

- Protected Structures (RPS 003, 008, 010, 012, 013) are of High sensitivity, reflecting their statutory protection and architectural, historical and group value.
- NIAH-listed structures of Regional significance are also considered High sensitivity, in accordance with national guidance.
- The historic demesne layout and designed landscape are considered Medium to High sensitivity, reflecting their contribution to the overall significance of the site.
- The archaeological resource, comprising predominantly post-medieval features of local importance, is assessed as Medium sensitivity.
- Modern structures and fabric are considered Low sensitivity.

10.4.2 Construction Phase Effects (Pre-Mitigation)

The construction phase will give rise to a range of direct and indirect impacts on the cultural heritage resource, including:

- demolition of structures,
- alteration to protected structures,

- ground disturbance affecting archaeological remains,
- temporary impacts on setting and visual character.

The most sensitive receptors include:

- Protected Structures (RPS 003, 008, 010, 012, 013),
- NIAH-listed structures of regional significance,
- the historic demesne layout and spatial relationships,
- subsurface archaeological resource.

Table 10-1: Construction Impact Assessment Matrix (Pre-Mitigation)

Ref	Impact Description	Heritage Asset (Sensitivity)	Nature of Impact	Duration	Magnitude	Quality	Significance of Effect
C1	Demolition of historic farm building (NIAH)	NIAH structure (High)	Total loss of historic fabric	Permanent	Moderate–Major	Adverse	Permanent, Moderate to Significant, Adverse
C2	Removal of sections of walled garden	RPS 012 (High)	Partial loss of protected fabric	Permanent	Moderate	Adverse	Permanent, Moderate, Adverse
C3	Alteration to boundary wall and bell tower	RPS 013 (High)	Physical intervention and incorporation into new development	Permanent	Moderate	Adverse	Permanent, Moderate, Adverse
C4	Refurbishment works to protected structures	RPS 003, 008, 010 (High)	Direct intervention in historic fabric	Permanent	Slight–Moderate	Adverse	Permanent, Slight to Moderate, Adverse
C5	Removal of modern structures	Modern fabric (Low)	Removal of non-historic accretions	Permanent	Slight	Positive	Permanent, Slight, Positive
C6	Construction activity (vibration, accidental damage risk)	All protected structures (High)	Indirect risk of damage	Temporary	Slight	Adverse	Temporary, Slight, Adverse
C7	Temporary visual and setting impacts	Site setting (Medium–High)	Visual intrusion from plant, scaffolding, compounds	Temporary	Slight	Adverse	Temporary, Slight, Adverse
C8	Ground disturbance affecting known archaeology	Archaeological resource (Medium)	Removal/truncation of post-medieval features	Permanent	Moderate	Adverse	Permanent, Moderate, Adverse
C9	Potential disturbance of unknown archaeology	Archaeological resource (Medium)	Potential loss of unrecorded features	Permanent	Slight–Moderate	Adverse	Permanent, Slight to Moderate, Adverse

10.4.2.1 Summary of Construction Effects

The principal construction phase effects comprise:

- Permanent loss of historic fabric, including:
- demolition of a NIAH-listed structure (C1), and
- partial removal of protected walled garden fabric (C2);
- Direct intervention in protected structures, including alteration to the boundary wall and bell tower (C3);
- Archaeological impacts, including permanent loss of post-medieval features (C8, C9);
- Temporary indirect effects, including vibration risk and visual disturbance (C6, C7).

These effects are site-specific, permanent in part, and predominantly **Short-term Moderate Adverse, with some Moderate to Significant Adverse effects**.

10.4.3 Operational Phase Effects (Pre-Mitigation)

Operational impacts arise from the permanent physical changes introduced by the development, including:

- introduction of new built form within the historic landscape,
- alteration to spatial relationships and enclosure,
- long-term use and maintenance of historic structures.

Table 10-2: Operational Impact Assessment Matrix (Pre-Mitigation)

Ref	Impact Description	Heritage Asset (Sensitivity)	Nature of Impact	Duration	Magnitude	Quality	Significance of Effect
O1	Introduction of new hospital building within walled garden	Historic setting / RPS (High)	Alteration of spatial relationships and enclosure	Permanent	Moderate	Adverse	Permanent, Moderate, Adverse
O2	Loss of historic farm building	Estate composition (High)	Permanent removal of historic element	Permanent	Moderate–Major	Adverse	Permanent, Moderate to Significant, Adverse
O3	Retention and continued use of St. Edmundsbury House	RPS 003 (High)	Securing long-term use and maintenance	Permanent	Moderate–High	Positive	Permanent, Significant, Positive
O4	Adaptive reuse of outbuildings	RPS 008, 010 (High)	Sustainable reuse of heritage assets	Permanent	Moderate	Positive	Permanent, Moderate, Positive
O5	Alteration to boundary walls and walled garden	RPS 012, 013 (High)	Modification of fabric and layout	Permanent	Slight–Moderate	Adverse	Permanent, Slight to Moderate, Adverse
O6	Removal of modern accretions	Site fabric (Low)	Restoration of historic legibility	Permanent	Slight–Moderate	Positive	Permanent, Slight to Moderate, Positive
O7	Changes to setting (roads, landscaping, infrastructure)	Site setting (Medium–High)	Alteration of historic landscape character	Permanent	Slight–Moderate	Adverse	Permanent, Slight to Moderate, Adverse
O8	Archaeological resource (post-construction)	Archaeology (Medium)	No further disturbance	Permanent	Negligible	Neutral	Permanent, Neutral

10.4.3.1 Summary of Operational Effects

The operational phase results in:

- permanent alteration to parts of the historic estate layout, including the walled garden and farmyard context;
- loss of a historic farm building, representing a Moderate to Significant Adverse effect;
- substantial positive effects arising from:
 - retention and reuse of protected structures,
 - long-term maintenance and viability of heritage assets.

The overall operational effects are mixed, comprising **Permanent Adverse and Positive** outcomes, site-specific, and largely **Moderate** in scale, with both positive and negative components.

10.4.4 Do-Nothing Scenario

In the absence of the proposed development, the site would continue in its current condition, with limited intervention or investment in the historic fabric.

Table 10-3: Do-Nothing Scenario Impact Assessment Matrix

Ref	Impact Description	Heritage Asset	Nature of Impact	Duration	Magnitude	Quality	Significance
DN1	Continued deterioration of underused structures	Historic buildings (High)	Ongoing fabric decay	Long-term / Permanent	Moderate–High	Adverse	Long-term to Permanent, Moderate to Significant, Adverse
DN2	Lack of maintenance of historic fabric	All protected structures	Progressive deterioration	Long-term	Moderate	Adverse	Long-term, Moderate, Adverse
DN3	Loss of viability and function	Entire site	Functional obsolescence	Long-term	Moderate	Adverse	Long-term, Moderate, Adverse

10.4.4.1 Summary of Do-Nothing Scenario

The do-nothing scenario would result in:

- ongoing deterioration of historic fabric,
- loss of functional viability, and
- gradual erosion of heritage value.

These effects are:

- cumulative,
- progressive, and
- adverse, with potential to become significant over time.

10.4.5 Intangible Cultural Heritage

The site has historical associations with the development of mental health care in Ireland, including its long-standing use as part of the St. Patrick's Hospital network.

The proposed development will:

- retain the site in institutional use, and
- continue its association with healthcare provision.

No adverse impacts on intangible cultural heritage, including cultural associations, social value or historical continuity of use, have been identified.

The effect is therefore assessed as **Long term, Neutral to Slight Positive**

10.4.6 Archaeology

In accordance with the recommendations of the ACAS archaeological inspection report, all ground disturbance works associated with the proposed development will be subject to archaeological monitoring.

Monitoring will be undertaken by a suitably qualified archaeologist and will include all excavation works, including:

- enabling works
- foundation excavation
- drainage and service installation
- site clearance

Where archaeological features are identified, works in the affected area will cease and appropriate mitigation measures will be implemented in consultation with the National Monuments Service and the Planning Authority.

This may include preservation in situ or preservation by record, including archaeological excavation where required. A detailed method statement and programme of archaeological works will be agreed prior to commencement of development.

10.5 Mitigation Measures

Mitigation measures are proposed to:

- avoid impacts where feasible,
- reduce the magnitude of impacts where avoidance is not possible, and
- ensure that interventions to cultural heritage assets are undertaken in accordance with established conservation best practice.

All mitigation measures outlined in this section relate directly to the impacts identified and are informed by the conservation documentation in Appendix 10 prepared for the project by Carrig Conservation, including:

Architectural Inventory, Condition Survey and Appraisal

JRX-JBAI-XX-XX-RP-EN-0003-S3-P03-SPMHS_EIAR_Main_Report

Conservation Repair Methodology and Specification

Architectural Heritage Impact Assessment (AHIA)

All mitigation measures described below are assumed to be fully implemented in the assessment of residual impacts.

10.5.1 Construction Phase Mitigation

All works affecting protected structures and heritage fabric will be carried out:

- under the supervision of a Conservation Architect,
- by contractors with demonstrable experience in conservation works, and
- in accordance with the detailed methodologies set out in Carrig Conservation Repair Methodology and Specification (Refer to Appendix 10).

Table 10-4: Construction Mitigation Measures

Ref	Impact (Section 5)	Mitigation Measures	Resulting Effect (Post-Mitigation)
C1	Demolition of historic farm building	- Full Level 3 building recording (drawn, photographic and written) prior to demolition in accordance with best practice guidance - Salvage and cataloguing of reusable materials (stone, timber, fittings) for reuse within the development - Archival record to be deposited with the Planning Authority and National Inventory of Architectural Heritage	Permanent, Moderate, Adverse (impact unavoidable but fully recorded)
C2	Removal of sections of walled garden	- Extent of removal limited to that shown on approved drawings- Careful dismantling of masonry by hand - Salvage, storage and reuse of stone within reinstated or new boundary treatments - Recording prior to removal in accordance with Appendix 10	Permanent, Slight, Adverse
C3	Alteration to boundary wall and bell tower	- Detailed method statements for all interventions prepared in advance - Minimum intervention approach adopted - Use of lime-based mortars and compatible materials as specified in Appendix 10 - Retention of maximum historic fabric - All works undertaken by specialist conservation contractor	Permanent, Slight to Moderate, Adverse
C4	Works to protected structures	- All works carried out in accordance with Appendix 10 (Conservation Repair Methodology and Specification) - Retention of historic fabric as a priority - Use of breathable materials (lime mortars, renders, appropriate joinery repair techniques) - No unnecessary replacement of original elements - Ongoing supervision by conservation architect	Permanent, Slight, Adverse to Moderate Positive
C5	Removal of modern structures	- Controlled demolition sequence - Protection measures for adjacent historic fabric - Pre-demolition condition surveys of adjacent protected structures	Permanent, Slight, Positive
C6	Construction activity (vibration / damage risk)	- Establishment of exclusion zones around protected structures - Pre- and post-construction condition surveys - Vibration monitoring where works occur in proximity to historic fabric - Restriction on use of heavy plant near protected structures - Temporary protective measures (hoarding, padding, bracing)	Temporary, Imperceptible to Slight, Adverse
C7	Temporary visual and	- Careful siting of compounds and storage areas away from key heritage features - Minimisation of scaffolding extent and duration	Temporary, Imperceptible

	setting impacts	- Good site housekeeping practices - Removal of temporary works immediately following use	
C8	Disturbance of known archaeology	- Full-time archaeological monitoring of all ground disturbance works - Implementation of mitigation strategy in accordance with ACAS report (Appendix 10.) - Preservation in situ where feasible - Preservation by record (excavation) where necessary - Reporting to National Monuments Service	Permanent, Slight, Adverse
C9	Unknown archaeology	- Same monitoring regime as above - Immediate cessation of works in the event of discovery - Establishment of buffer zones where required - Agreement of mitigation strategy with National Monuments Service prior to resumption	Permanent, Slight, Adverse

10.5.2 Summary of Construction Mitigation

Following implementation of the above measures:

- Direct impacts on protected structures are reduced to slight or slight-to-moderate adverse effects;
- Risks associated with construction activity are controlled and minimised;
- Archaeological impacts are managed through monitoring and recording;
- Unavoidable losses (e.g. demolition of the farm building) are fully documented and partially offset through salvage and reuse.

10.5.3 Operational Phase Mitigation

Operational mitigation is embedded within:

- the architectural design,
- the conservation strategy, and
- the landscape design of the development.

The objective is to:

- retain the legibility of the historic estate,
- ensure compatibility between new and historic fabric, and
- support the long-term conservation of heritage assets.

Table 10-5: Operational Mitigation Measures

Ref	Impact (Section 5)	Mitigation Measures	Resulting Effect (Post-Mitigation)
O1	New hospital building within historic setting	- Siting within footprint of walled garden to contain impact - Height restricted to 1–2 storeys - Retention of key views to and from protected structures - Integration of retained historic walls into design - Landscape design reflecting historic enclosure patterns	Permanent, Slight to Moderate, Adverse
O2	Loss of historic farm building	- Interpretation strategy to record and communicate former building (e.g. signage, archival material) - Reuse of salvaged materials within site - Retention of footprint in landscape where feasible	Permanent, Moderate, Adverse
O3	Retention of St. Edmundsbury House	- Implementation of ongoing maintenance plan - Continued active use ensuring building viability - Repairs carried out in accordance with conservation best practice	Permanent, Significant, Positive
O4	Adaptive reuse of outbuildings	- Minimal intervention approach - Retention of structural form and character - Use of compatible materials and detailing - Reversible interventions where feasible	Permanent, Moderate to Significant, Positive
O5	Alteration to walls and garden	- Conservation repair of retained sections - Use of salvaged stone in new works - Clear distinction between historic and new fabric - Retention of legibility of historic layout	Permanent, Slight, Adverse
O6	Removal of modern accretions	- Careful removal to avoid damage to underlying fabric - Repair and reinstatement of original materials where possible	Permanent, Moderate, Positive
O7	Changes to setting	- Landscape design informed by historic layout - Retention and reinforcement of boundary treatments - Sensitive lighting design to avoid visual intrusion - Control of signage and external fixtures	Permanent, Slight, Adverse
O8	Archaeology	- No further mitigation required post-construction	Permanent, Neutral

10.5.4 Summary of Operational Mitigation

Following mitigation Adverse effects on setting and layout are reduced but not eliminated;

Positive effects associated with:

- reuse,
- repair, and
- long-term maintenance, are secured and enhanced

The development results in a balanced outcome, with conservation benefits offsetting unavoidable losses.

10.6 Residual Impacts

This section presents the residual impacts of the proposed development on cultural heritage, following the implementation of the mitigation measures

Residual impacts represent the likely significant effects remaining after mitigation and are assessed using the same methodology in accordance with the Environmental Protection Agency Guidelines (2022).

All residual effects are directly derived from the mitigation measures, and expressed in terms of quality, magnitude, duration, and significance.

Table 10-6: Residual Impact Assessment Matrix

Ref	Impact (Section 5)	Residual Effect	Reasoning
C1	Demolition of historic farm building	Permanent, Moderate, Adverse	Total loss of structure remains unavoidable; mitigation limited to recording, salvage and interpretation
C2	Removal of sections of walled garden	Permanent, Slight, Adverse	Reduction in impact achieved through minimisation, salvage and reuse of fabric
C3	Alteration to boundary wall and bell tower	Permanent, Slight to Moderate, Adverse	Conservation-led approach reduces magnitude but intervention remains permanent
C4	Works to protected structures	Permanent, Slight, Adverse to Moderate, Positive	Careful repair and reuse results in a net beneficial outcome despite intervention
C5	Removal of modern structures	Permanent, Slight, Positive	Removal improves legibility of historic layout
C6	Construction activity (vibration / damage risk)	Temporary, Imperceptible to Slight, Adverse	Controlled through monitoring, exclusion zones and protection measures
C7	Temporary visual impacts	Temporary, Imperceptible	Short duration and managed through site controls
C8	Disturbance of known archaeology	Permanent, Slight, Adverse	Monitoring ensures preservation by record; loss of material remains unavoidable
C9	Unknown archaeology	Permanent, Slight, Adverse	Low likelihood; impacts controlled through monitoring regime

10.6.1 Summary of Construction Residual Impacts

Following mitigation unavoidable permanent impacts remain, including:

- demolition of a historic farm building, and
- partial loss of walled garden fabric;

These impacts are localised and reduced in magnitude, generally to Slight or Moderate Adverse. Risks associated with construction activity are effectively controlled and reduced to Imperceptible or Slight. Archaeological impacts are managed through monitoring, resulting in recorded loss rather than uncontrolled disturbance.

Overall, construction phase residual impacts are localised, predictable, and reduced to an acceptable level in EIAR terms.

Table 10-7: Residual Impact Assessment

Ref	Impact (Section 5)	Residual Effect	Reasoning
O1	New hospital building within historic setting	Permanent, Slight to Moderate, Adverse	Design mitigation reduces but does not eliminate change to spatial relationships
O2	Loss of historic farm building	Permanent, Moderate, Adverse	Permanent removal of estate element; partially offset through interpretation and reuse of materials
O3	Retention of St. Edmundsbury House	Permanent, Significant, Positive	Long-term use and maintenance secured
O4	Adaptive reuse of outbuildings	Permanent, Moderate to Significant, Positive	Sustainable reuse enhances viability and condition
O5	Alteration to walls and garden	Permanent, Slight, Adverse	Limited and controlled intervention
O6	Removal of modern accretions	Permanent, Moderate, Positive	Improves legibility of historic layout
O7	Changes to setting and circulation	Permanent, Slight, Adverse	Localised alteration to landscape character
O8	Archaeology (post-construction)	Permanent, Neutral	No further impacts following construction

10.6.2 Summary of Operational Residual Impacts

Following mitigation Adverse impacts remain in relation to:

- alteration of the historic layout, and
- loss of certain heritage elements;

These impacts are permanent, localised, and generally **Permanent Slight to Moderate Adverse**;

Balanced against this are the Significant positive effects arise from:

- continued use of protected structures,
- repair and conservation of historic fabric, and
- long-term viability of the site as a managed heritage environment.

10.6.3 Residual Impacts – Archaeology

Archaeological mitigation, including full monitoring and preservation by record, ensures that impacts on known archaeological features are controlled and documented, and the risk of unrecorded loss is minimised.

Residual archaeological impacts are therefore **Permanent, Slight, Adverse**, reflecting the loss of material despite recording.

No residual operational impacts on archaeology arise following completion of construction.

10.6.4 Overall Residual Impact

Following the implementation of mitigation measures, the proposed development will result in a combination of adverse and beneficial residual effects on cultural heritage.

Residual adverse effects arise from the permanent loss of:

- a historic farm building, and
- limited sections of the walled garden;
- localised alteration to the historic layout, and
- spatial relationships within the estate.

These effects are **Permanent, Localised, and Moderate at worst, Slight Adverse**.

Residual positive effects arise from securing the long-term use and maintenance of:

- St. Edmundsbury House,
- the coach house and stable block;
- repair and conservation of historic fabric;
- removal of inappropriate modern accretions.

These effects are **Permanent, Site-wide, and Moderate to Significant Positive**.

On balance, the proposed development will result in a combination of localised adverse effects and substantial positive effects, with the latter arising from the long-term conservation, repair and active use of the principal heritage assets within the site. The residual impact on cultural heritage is therefore assessed as Acceptable, with a net positive outcome arising from the sustainable reuse and conservation of the historic estate.

10.7 Interactions

Cultural Heritage and Landscape and Visual -NIAH records to be retained, protected and incorporated/ showcased in the design of the building interact and to the amenity offered by the proposed development.

Cultural Heritage and Biodiversity-There will be an interaction between Cultural Heritage and Biodiversity during the construction phase, as the proposed refurbishment/demolition of the

existing historical structures on site, including the stonewalls, will lead to the removal of the existing flora. In the event archaeological remains are identified during the stripping of topsoil during the construction phase, additional impacts on biodiversity may occur.

10.8 Potential Cumulative Impacts

The potential for cumulative effects has been considered with reference to existing and permitted developments in the vicinity of the site, including proposals along the Lucan Road corridor and within the wider institutional landscape.

The proposed development is:

- physically contained within the existing St. Edmundsbury campus, and
- does not give rise to direct impacts on off-site protected structures or recorded monuments.

No significant cumulative impacts on cultural heritage have been identified arising from:

- the combination of this development with other known or permitted developments, or
- incremental change to the wider historic landscape.

Cumulative effects are therefore assessed as Not Significant.

11 Landscape and Visual Amenity

11.1 Assessment Methodology

The landscape and visual amenity chapter examines the potential effects of the proposed development on views of receptors within the Zone of Theoretical Visibility including residential properties and nearby open spaces, in terms of visual intrusion and visual obstruction. It also examines the impact on landscape character areas from the permanent physical changes to the site brought about by the development.

The Landscape and Visual Impact Assessment in the EIAR and takes into consideration aerial photography, emerging design drawings, relevant various publications and reports, together with visits to the site and environs of the proposed development. The Assessment is carried out in accordance with:

- Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports;
- Guidelines for Landscape and Visual Impact Assessment (GLVIA) as published by the Landscape Institute (UK) and the Institute of Environmental Management and Assessment (3rd Edition, 2013); and
- Draft Landscape Character Assessment (LCA) of South Dublin County (Draft Report May 2021), appendix 9 of the South Dublin County Development Plan 2022-2028.

Verified photomontages in accordance with the GLVIA guidance are included to facilitate the assessment of visual impacts. The mitigation measures for the protected structures have been agreed following liaison with the Conservation Officer.

11.1.1 Landscape Impact Assessment Criteria

When assessing the potential impacts on the landscape resulting from a proposed project, the following criteria are considered:

- Landscape character sensitivity;
- Magnitude of likely impacts; and
- Significance of landscape effects.

11.1.2 Sensitivity of the Landscape

The sensitivity of the landscape to change is the degree to which a particular Landscape Character Area (LCA) can accommodate changes or new elements without unacceptable detrimental effects to its essential characteristics.

Landscape Sensitivity, often referred to as 'value', is classified using the following criteria which have been derived from a combination of industry guidelines from the Landscape Institute for Landscape and Visual Impact Assessment and professional judgement.

- Very high - Areas where the landscape character exhibits a very low capacity for change in the form of development. Examples of which are very high value landscapes, protected at an international level e.g., World Heritage Site, where the principal management objectives are likely to be protection of the existing character;
- High - Areas where the landscape character exhibits a low capacity for change in the form of development. Examples of which are high value landscapes, protected at a national level e.g., National Park, where the principal management objectives are likely to be protection of the existing character;
- Medium - Areas where the landscape character exhibits a medium capacity for change in the form of development. Examples of which are medium value landscapes, protected at a Local or Regional level e.g., Open space areas mentioned within a County Development Plan, where the principal management objectives are likely to be protection of the existing character;
- Low - Areas where the landscape character exhibits a high capacity for change and has very few or no designated landscapes or open space areas; and

- Negligible - Areas of landscape character that include derelict, mining, industrial land or are part of the urban fringe where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of landscape improvements and/or restoration to realise a higher landscape value.

11.1.3 Magnitude of Likely Landscape Impacts

The magnitude of a predicted landscape impact is a product of the scale, extent or degree of change that is likely to be experienced as a result of the proposed project. The magnitude takes into account whether there is a direct physical impact resulting from the loss of landscape components and/or a change that extends beyond the boundary of the proposed project that may have an effect on the landscape character of the area.

- Very high - Change that would be large in extent and scale with the loss of critically important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the landscape in terms of character, value and quality;
- High - Change that would be more limited in extent and scale with the loss of important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the landscape in terms of character, value and quality;
- Medium - Changes that are modest in extent and scale involving the loss of landscape characteristics or elements that may also involve the introduction of new uncharacteristic elements or features that would lead to changes in landscape character, and quality;
- Low - Changes affecting small areas of landscape character and quality, together with the loss of some less characteristic landscape elements or the addition of new features or elements;
- Negligible - Changes affecting small or very restricted areas of landscape character. This may include the limited loss of some elements or the addition of some new features or elements that are characteristic of the existing landscape or are hardly perceivable;
- Neutral - Changes that do not involve the loss of any landscape characteristics or elements and will not result in noticeable changes to the prevailing landscape character; and
- Positive - Changes that restore a degraded landscape or reinforce characteristic landscape elements.

11.1.4 Significance of Landscape Effects

The significance of the landscape impact will be the combination of the sensitivity of the landscape against the magnitude of the change. It is summarised in Table 11-1 below.

Table 11-1: Significance of Landscape and Visual effects based on Magnitude and Sensitivity

MAGNITUDE	SENSITIVITY				
	Very high	High	Medium	Low	Negligible
Very high	Profound	Very significant	Significant	Moderate	Slight
High	Very significant	Significant	Moderate	Slight	Slight
Medium	Significant	Moderate	Slight	Slight	Imperceptible
Low	Moderate	Slight	Slight	Imperceptible	Imperceptible
Negligible	Slight	Slight	Imperceptible	Imperceptible	Imperceptible
Neutral	Imperceptible	Imperceptible	Imperceptible	Imperceptible	Imperceptible
Positive	Positive	Positive	Positive	Positive	Imperceptible

11.1.5 Sensitivity of Visual Receptors

Unlike landscape sensitivity, the sensitivity of visual receptors has an anthropocentric basis. It considers factors such as the perceived quality and values associated with the view, the landscape context of the viewer, the likely activity they are engaged in and whether this heightens their awareness of the surrounding landscape.

Visual receptors most susceptible to changes in views and visual amenity are;

- Very high - Residents in properties within protected landscapes and travellers on a Scenic route where awareness of views is likely to be heightened;
- High – Residents in properties with predominantly open views from windows, garden or curtilage. People, whether residents or visitors, who are engaged in outdoor recreation including use of public rights of way, whose attention or interest is likely to be focused on the landscape and on particular views, and those on a scenic route where the view is not specifically in the direction of the proposed development;
- Medium - Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience, and communities where views contribute to the landscape setting enjoyed by residents in the area.
- Low - People engaged in outdoor sport or active recreation on a local scale, which does not involve or depend upon appreciation of views of the landscape; and people at their place of work whose attention may be focused on their work or activity, not their surroundings and where the setting is not important to the quality of working life, and people travelling in vehicles where their view is limited to a few minutes at any viewpoint; and
- Negligible - Changes affecting restricted viewpoints.

11.1.6 Magnitude of Visual Impact

The magnitude of a visual effect is determined on the basis of several factors: the relative numbers of viewers, the distance from the viewpoint, the visual dominance of the proposed development within a view and its effect on visual amenity, as follows:

- Very high - The proposal intrudes into a large proportion or critical part of the available vista and is without question the most noticeable element. A high degree of visual clutter or disharmony is also generated, strongly reducing the visual amenity of the scene;
- High - The proposal intrudes into a significant proportion or important part of the available vista and is one of the most noticeable elements. A considerable degree of visual clutter or disharmony is also likely to be generated, appreciably reducing the visual amenity of the scene;
- Medium - The proposal represents a moderate intrusion into the available vista, is a readily noticeable element and/or it may generate a degree of visual clutter or disharmony, thereby reducing the visual amenity of the scene. Alternatively, it may represent a balance of higher and lower order estimates in relation to visual presence and visual amenity;
- Low - The proposal intrudes to a minor extent into the available vista and may not be noticed by a casual observer and/or the proposal would not have a marked effect on the visual amenity of the scene; and
- Negligible - The proposal would be barely discernible within the available vista and/or it would not detract from, and may even enhance, the visual amenity of the scene.
- Magnitude can also be described as:
- Neutral - Changes that are not discernible within the available vista and have no bearing the visual amenity of the scene; and
- Positive - Changes that enhance the available vista by reducing visual clutter or restoring degraded features.

11.1.7 Visual Impact Significance

As stated above, the significance of visual impacts is a function of visual receptor sensitivity and visual impact magnitude. This relationship is expressed in the same significance matrix as used earlier in respect of landscape impacts, see Table 11-1.

11.1.8 Impact Classification Terminology

Table XXX in chapter 1 presents the Impact Classification Terminology as published in the EPA guidance document¹³. Standard definitions are provided in this glossary, which permit the evaluation and classification of the quality, significance, duration and type of impacts associated with a proposed development on the receiving environment.

Each impact is described in terms of its quality, significance, extent, duration & frequency and type, where possible.

11.1.9 Cumulative Impact Assessment

The immediate area (0.5km radius) in which the site is located contains several residential, commercial and industrial developments, as outlined in Chapter 13.

There is potential for cumulative effects to arise on landscape and visual amenity. The cumulative effect of a set of developments is the combined effect of all the developments taken together in proportion to the scale of the affected area, duration and magnitude of change to a view.

Cumulative effects on visual amenity consist of combined visibility and sequential effects. Combined visibility occurs where the observer is able to see two or more developments from one viewpoint.

- Combined visibility may either be in combination (where several developments are within the observer's arc of vision at the same time) or in succession (where the observer has to turn to see the developments).
- Sequential effects occur when the observer has to move to another viewpoint to see different developments. For example, this could be when travelling along roads or paths. The occurrence of sequential effects may range from frequently sequential (the features appear regularly and with short time lapses between, depending on speed of travel and distance between the viewpoints) to occasionally sequential (long time lapses between appearances, because the observer is moving very slowly and / or there are large distances between the viewpoints).

Cumulative landscape effects affect the physical fabric or character of the landscape, or any special values attached to the landscape.

- Cumulative effects on the physical fabric of the landscape arise when two or more developments affect landscape components such as woodland, dykes or hedgerows. Although this may not significantly affect the landscape character, the cumulative effect on these components may be significant – for example, where the last remnants of former shelterbelts are completely removed by two or more developments.
- Cumulative effects on landscape character arise from two or more developments. Apartment blocks introduce new features into the landscape. In this way, they can so change the landscape character that they can create a different landscape character type. That change need not be negative; some derelict or industrialised landscapes may be enhanced as a result of such a change in landscape character. The cumulative effects on landscape character may include other changes, for example trends or pressures for change over long time periods, which should form part of any consideration of a particular project.

11.1.10 Approach taken

This cumulative assessment focuses on any impacts arising from the development of the proposal in combination with the presence of the existing developments in the area. Although other similar developments are present within the wider area these are sufficiently small in scale that significant cumulative effects are not expected.

¹³ Environmental Protection Agency (2022) *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*

11.2 Baseline Environment

11.2.1 Timing of Surveys

Landscape surveys were conducted in February and June of 2023. Evidence of variation in the level of screening provided as part of winter and summer vegetation is therefore represented. Consideration of additional seasonal changes, where relevant, has been given within the assessment.

11.2.2 Landscape Character

11.2.2.1 Immediate Site Surrounds

The site sits between contrasting urban and semi-natural landscapes present within the Liffey Valley Landscape Character Area. The southern urban landscape is mostly residential estates including Lucan Heights, Ballydowd, and Woodville in the southeast and to the southwest lies Lucan village and Sarsfield Estate. Lucan Pieta House and St. Mary's Church are directly south and overlook the site from the R835. There are several schools proximal to the site. St. Andrews National School is directly east, Village Montessori Preschool is directly west and St. Mary's BNS is further west. Saint Joseph's College and Soil Mhuire Girls National lie to the southwest along the continuation of the R835. North and east of the estate are woodland and arable agricultural lands respectively. To the west, adjacent to the Liffey River, is a small industrial complex and further west is the Laraghcon residential estate.

The Lucan Road (R835) forks at the southwest corner of the site into Chapel Hill (L1005) which leads to Lucan village, and a continuation of Lucan Road south of Lucan village. The Lower Lucan Road (R109) runs to the west of the site and the Liffey River.

There are two access points to the site along Lucan Road (R835). Both are used by pedestrians, although, one is private and the other is public. The private road separates the site from St. Andrews National School to the east. The other public access road lies further east of the site.

The woodland forming the western estate boundary as well as the woodland within the site grounds are part of the Liffey Valley proposed Natural Heritage Area (pNHA) which comprises approximately 1.65 km² of riparian woodland that extends along 11.8 km of the Liffey between Leixlip and Chapelizod. Parts of the pNHA are also protected under the Liffey Valley Special Amenity Area Order (SAAO). The woodland on the site grounds is exempt from the SAAO.

The hospital grounds, former walled garden, derelict farmyard and associated buildings cannot be accessed by the public. However, both access roads form a connection with paths through the agricultural open space to the north and east and collectively form part of a public walking route that connects with trails through the Liffey Valley riparian woodland.

11.2.2.2 Wider Landscape

The Liffey Valley Landscape Character Area (LCA) is comprised of several Landscape Character Types (LCTs). These include the River Valley, Historic Urban and Urban, Green space, and Transport Corridor. The River Valley Type extends east and west of the site, including the Strawberry Beds 3.4 km east adjacent to the M50. This represents the rural aspects of the landscape. Three golf courses lie to the east and northeast:

- Luttrellstown Castle Resort (northeast)
- Hermitage Golf Club (east)
- Castleknock Golf Club (east)

Palmerstown, Lucan Village, and surrounding residential estates and developments form the historical and modern urban landscapes present within the area. These urban centres which are served by major and minor transport routes contrast with the natural features of the landscape. This enmeshment between natural and built environments creates a distinct and unique character.

The Liffey Valley LCA is in good to moderate condition. The scenic elements of the valley, such as riparian woodland and arable fields, add interest to the urban setting and soften the hard aspects associated with the built environment. Conversely, aspects of built elements, particularly noise from transport routes, can detract from the rural characteristics. The landscape carries a medium to high sensitivity with a medium capacity for change. South of the N4 the landscape character is

described as urban with no designated sensitivity. The overall landscape sensitivity is derived from the differences in landscape sensitivities and values of the LCTs within the LCA.

11.2.2.3 South Dublin County Development Plan

The site is within the Liffey Valley Landscape Character Area. The site is characterised by a mixture of river valley features such as gently sloping hills, riparian vegetation and woodland framed by pastures and woodland. Rich and fertile alluvial soils and presence of the river attracted early settlement making it a place rich in local history and culture. Presently, the mosaic of urbanised areas and surviving rural features create a distinct landscape heterogeneity. Much of the Lower Lucan Road is bounded by dense vegetation strongly resembling that of a rural road despite its suburban position.

The Landscape Character Type has been assigned a medium to high sensitivity in the SDCC CDP.

11.2.3 Visual Amenity

11.2.3.1 Summary of Visual Amenity

In 1990, a Special Amenity Area Order (SAAO) was made for Liffey Valley, extending from Lucan Bridge to Chapelizod. An SAAO recognises an area for having exceptional natural beauty, special recreational value or supporting nature conservation. Liffey Valley starkly contrasts with its highly urbanised environs providing tranquil scenery of woodland and riparian features.

11.2.3.2 Zone of Theoretical Visibility

A Zone of Theoretical Visibility (ZTV) was produced for the assessment. The ZTV shows the areas that the proposed development could be visible in the surrounding landscape within a radius from the centre of the proposed development. This is taken into consideration to form the study area for the assessment of visual impacts. The radius that is considered needs to be proportional to the height and extents of the proposed development. For this proposed development, the ZTV maps show the area with potential visibility within a 5 km radius from the proposed works for international designations and 0.5km for less sensitive receptors see Figure 11-1 and Figure 11-2 respectively. The ZTV was based on a viewer height of 1.6m and building heights of 3.5m for single storey sections and 8m for two storey parts of the development. The ZTV is based on a digital terrain model (DTM) and represents a bare ground scenario i.e., with no trees, hedgerow or built features present that would provide screening.

The existing buildings and vegetation in the area means that visibility on the ground is constrained to a much greater extent than is implied with the DTM ZTV.

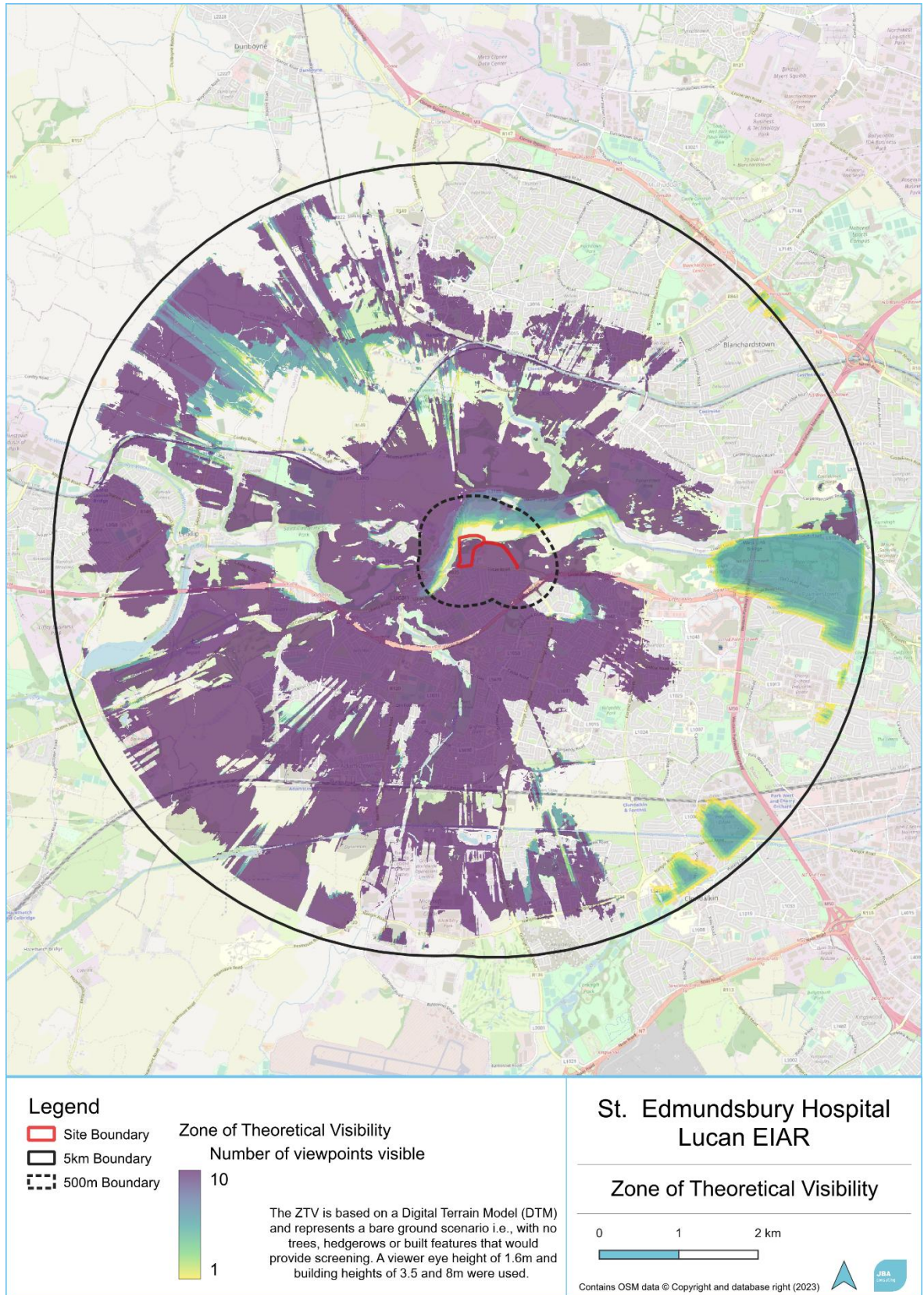


Figure 11-1: Zone of Theoretical Visibility

11.2.3.3 Views and Prospects

Chapter 3 of the CDP defines policies and objectives regarding Natural, Cultural and Built Heritage (NCBH). Policy NCBH15 of the SDCC CDP sets out several objectives pertaining to Views and Prospects. Views over Lucan Village and Liffey Valley can be seen at the peak of Esker Hill. Development of this vantage point is a Specific Local Objective (NCBH15 SLO 3).

The view from Lucan bridge over the weir upstream of the River Liffey to the west is a protected view. The view faces in the opposite direction to the proposed site and has been screened out of this assessment.

11.3 Potential Effects

11.3.1 Assessment of Effects on Landscape Character

The proposed development is expected to locally alter the immediate landscape of St. Edmundsbury Estate. The proposed building will be sitting in what is currently a greenfield, a semi-natural area. The remains of the original farmyard and associated buildings including the barn and coach house (RPS ref. 008) and bell tower (RPS ref. 013), will be acquired and incorporated into development. Along the southern section of the site runs a stone wall that formerly bound the estate's historic walled garden (RPS ref. 012). There is evidence of anti-social behaviour within the remains of the farm building. The proposed development is expected to improve the amenity offered in the area as the enhanced passive surveillance is expected to deter such activities. The historic features are important elements that imbue a sense of place and history, and the proposed development seeks to retain the garden walls which are integral in the overall design of the building. As these parts of the site are not accessed by the public and will remain private following the completion of the project the visual effect on the internal landscape character will be **Permanent, Slight, Positive**.

The proposed development is expected to contribute to the urbanising elements of the locale landscape. The removal of the existing overgrown hedgerow along the eastern boundary is expected to reduce the distinctiveness of the character of the area. The proposed treeline and soft landscape are compensating for the loss of the vegetative boundary and is expected to enrich the visual experience of the users of the access route to the east. The effect of the proposed development to the landscape character is expected to be **Permanent, Slight, Positive**.

The landscape carries a medium to high sensitivity with a medium capacity for change. This arises from the differences in landscape sensitivities and values of the LCTs within the LCA.

11.3.2 Assessment of Effects on Visual Amenity

Receptor groups were selected during the initial desktop study using aerial imagery and Google street view and verified on site during the site visit. Receptors were grouped based on function, i.e., residential buildings, community buildings, etc., and location.

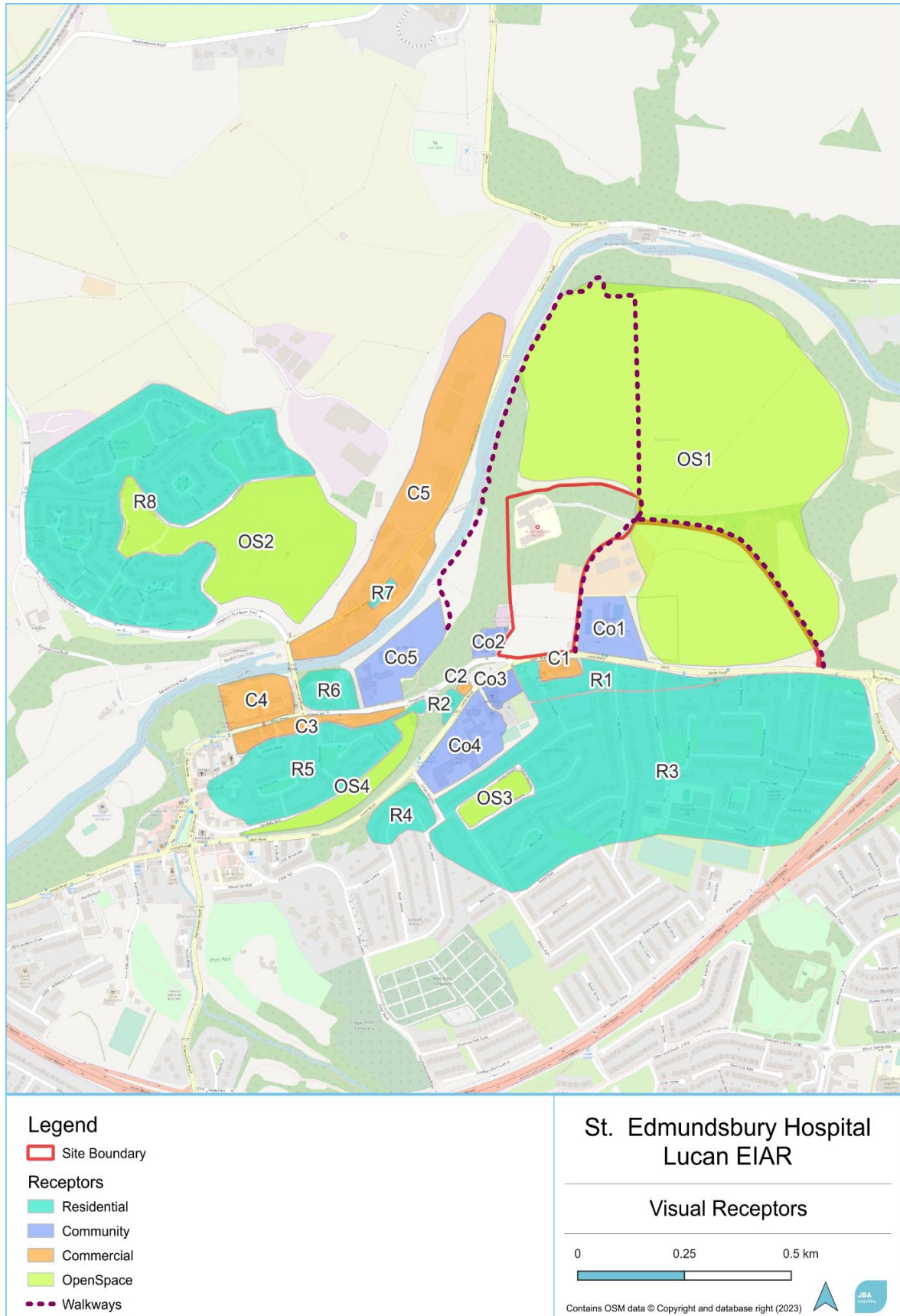


Figure 11-2: Higher sensitivity visual receptor groups within the 1km radius

Put in Appendix

Table 11-2: Visual Receptor summary table

Receptor No.	Distance from proposed development	Sensitivity	Magnitude of change	Predicted impact and duration:	
				Construction	Operation
R1	60 - 380m	High	Medium	Short-term, moderate, negative	Permanent, slight moderate, negative -
R2	120 - 200m	High	Low	Short-term, moderate, negative	Permanent, slight, negative
R3	50 - 790m	High	Low	Short-term, moderate, negative	Permanent, slight, negative
R4	345 - 520m	High	Low	Short-term, slight, negative	Permanent, slight, negative
R5	300 - 750m	High	Negligible	Short-term, slight, negative	Permanent, imperceptible, negative
R6	340 - 470m	High	Low	Short-term, slight, negative	Permanent, slight, negative
R7	280m	High	Negligible	Short-term, slight, negative	Permanent, imperceptible, negative
R8	450 - 1140m	High	Negligible	Short-term, moderate, negative	Permanent, slight, negative
Co1	10m	Low	Medium	Short-term, slight, negative	Permanent, slight, negative
Co2	10m	Low	Low	Short-term, slight, negative	Permanent, imperceptible, negative
Co3	25m	Low - High	Low	Short-term, slight, negative	Permanent, imperceptible - slight, negative
Co4	90 - 350m	Low	Low	Short-term, slight, negative	Permanent, imperceptible, negative
Co5	130 - 340m	Low	Negligible	Short-term, imperceptible, negative	Permanent, imperceptible, negative
C1	12m	Low - Medium	Low	Short-term, slight, negative	Permanent, slight, negative
C2	90m	Low	Low	Short-term, slight, negative	Permanent, slight, negative
C3	250 - 540m	Low	Low	Short-term, imperceptible,	Permanent, imperceptible,

				negative	negative
C4	480 - 660m	Low	Low	Short-term, imperceptible, negative	Permanent, imperceptible, negative
C5	115 - 480m	Low	Low	Short-term, imperceptible, negative	Permanent, imperceptible, negative
OS1	10 - 620m	High	Negligible	Short-term, slight, negative	Permanent, imperceptible, negative
OS2	350 - 910m	High	Negligible	Short-term, slight, negative	Permanent, imperceptible, negative
OS3	250 - 400m	High	Low	Short-term, slight, negative	Permanent, imperceptible, negative
OS4	250 - 650m	High	Negligible	Short-term, imperceptible, negative	Permanent, imperceptible, negative

11.3.2.1 Visually Sensitive Receptors

R1 (60 - 380 m southeast)

This receptor group includes the houses closest to the site are along the Lucan Road in the Ballydowd estate, to the south and southeast. They are detached and semi-detached two storey houses or bungalows with front and rear gardens. Houses along the Lucan Road have north and south facing views while houses off the Lucan Road face in east and west directions.

Sensitivity - Receptors would be residents at home. Sensitivity is high.

Magnitude - Two of the dwellings directly facing the site along the Lucan Road lack front hedges which makes views to and from the houses more direct. Further east along Lucan Road, front hedges are more common, however, views from upper storey windows are expected to be more direct and less filtered. During construction, onsite machinery and diversion are likely to have short-term negative effects. Removal of a large mature tree at the proposed pedestrian and vehicular entrance will expose the proposed development. In accordance with methodology the highest magnitude of change would be medium.

Effect - In accordance with Table 11-1Table 11-2 the visual effect for the closest houses located along the Lucan Road would therefore be **short-term, moderate, adverse** during construction, becoming permanent, slight, negative once the project is completed. For houses off the Lucan Road the visual effect will be **permanent, slight to moderate, adverse**.

R2 (120 - 200 m southwest)

A development of two and three-storey apartment buildings directly on Lucan Road southwest of the site. A high treeline lies along the southeastern boundary of Sarsfield Park (OS4) which is to the west of the apartment complex.

Sensitivity - Receptors would be residents at home. Sensitivity is high.

Magnitude - Second and third storey apartments have front balconies overlooking the Lucan Road and views of the site to the east are clear. Ground floor apartments are unlikely to have clear views of the development. The highest the magnitude of change will be low.

Effect - In accordance with Table 11-1Table 11-2 the visual effect will be **short-term, moderate, adverse** during construction becoming **permanent, slight, adverse** once the project is completed.

R3 (50 - 790 m south, southeast)

Houses further east along the Lucan Road into Woodville estate, and houses off the Lucan Road in Lucan Heights and Ballydowd are comprised of detached and semi-detached two-storey buildings and two storey terraces. Majority of dwellings have front and back gardens and there are several green spaces throughout the estates.

Sensitivity - Receptors would be residents at home. Sensitivity is high.

Magnitude - Houses in Woodville located on Lucan Road are expected to have some oblique views of the development given Lucan Road runs perpendicular to the development and the houses have north facing views. Moving into the estates houses are arranged along residential roads with mixed direction views. Views deeper into the estates are likely to be increasingly screened by other houses. Views from second storey windows or gardens may be present through gaps between houses, although they are likely to be indirect. The highest magnitude of change will be low.

Effect - In accordance with Table 11-1Table 11-2 the visual effect for houses on the Lucan Road will be **short-term, moderate, adverse**, during construction, becoming **permanent, slight, adverse** once construction is completed.

R4 (345 - 520 m southwest)

Houses in the most northeastern corner of Esker Lawns estate, located southwest of the development, and just off the Lucan Road are semi-detached two storey buildings with front and back gardens.

Sensitivity - Receptors would be residents at home. Sensitivity is high.

Magnitude - A treeline obscures the views to the Lucan Road, however, some gaps may be present allowing for angled, indirect views of the development, particularly from back gardens or back windows on the second storey. The magnitude of change will be low.

Effect - In accordance with Table 11-1Table 11-2 the visual effect during construction will likely be **short-term, slight, adverse**, becoming **permanent, slight, adverse** in operation.

R5 (300 - 750 m southwest)

The Sarsfield estate is comprised of two storey terraces with front and back gardens and a number of small green communal areas. There is also a single private dwelling to the northeast of the estate. Sarsfield Park runs from the south along the outer boundary of the estate to the east in a gentle curve. The park has a steep slope up to the Lucan Road which is separated from the park by a fence and tall treeline.

Sensitivity - Receptors would be residents at home. Sensitivity is high.

Magnitude - There is a notable lack of vegetation around houses and internal views between houses are much more direct than those of Lucan Heights, Ballydowd or Woodville. However, the steep slope of Sarsfield Park and treeline located along the highest edge of the park effectively screen views between the estate and the Lucan Road. The single house is surrounded by a small woodland and views are almost completely screened. Therefore, the magnitude of change will be negligible.

Effect - In accordance with Table 11-1Table 11-2 the visual effect will be **permanent, imperceptible, adverse**.

R6 (340 - 470 m southwest)

The Old Rectory is a small, gated estate along Chapel Hill (L1005). The Liffey River runs along the northern boundary and Lucan Bridge is along the eastern boundary of the estate. The estate is comprised of approximately 30 semi-detached and terraced houses. They are arranged at different angles with front and back gardens. Trees are located at the entrance and along the boundaries of the estate providing some privacy. A large green area at the northern edge sits between the houses and the Liffey River.

Sensitivity - Receptors would be residents at home. Sensitivity is high.

Magnitude - Houses located along the eastern boundary of the estate have east and west views. Those located closest to Chapel Hill may have some indirect views of the development. Other houses facing Chapel Hill have north and south facing views. It is possible that from second floor windows the development may be seen from time to time, however, the view would be angled and indirect. The cluster of houses located away from the road and closest to the Liffey River are unlikely to experience any views unless through gaps between the houses along the eastern edge. The highest magnitude of change will be low.

Effect - In accordance with Table 11-1Table 11-2 the visual effect will be **permanent, slight, adverse**.

R7 (280 m west)

A terrace of 10 houses and two additional semi-detached two storey buildings are located along Millbank Lower Road, west of the development and the Liffey River. Surrounding the houses are commercial buildings.

Sensitivity - Receptors would be residents at home. Sensitivity is high.

Magnitude - The houses have north westerly views from the front and south easterly views to the rear. Hills Industrial Estate borders the rear of the terrace and Ambassador Beds Lucan (both part of C5) are to the east. Views from these dwellings are obscured by buildings and riparian trees along the west bank of the Liffey and along the west boundary of the site. The magnitude of change will be negligible.

Effect - In accordance with Table 11-1Table 11-2 the visual effect during construction will be **short-term, slight, adverse** becoming **permanent, imperceptible, adverse**.

R8 (450 - 1140 m west)

Laraghcon estate is a large estate west of the development. Majority of the houses are two-storey detached houses with some semi-detached dwellings also, all with front and back gardens. Houses are arranged along curving residential roads in irregular patterns so views are multidirectional throughout the estate.

Sensitivity - Receptors would be residents at home. Sensitivity is high.

Magnitude - For houses facing Laraghcon Park (OS2) angled views of the development may be present from second storey windows. Moving west through the estate views are likely to be obscured further by houses, however, the development may still be visible through gaps, although these are likely to be oblique and mostly blocked by houses and the thick treeline present along the eastern boundary of Laraghcon Park. The magnitude of the change will be negligible.

Effect - In accordance with Table 11-1Table 11-2 the visual effect will be **permanent, imperceptible, adverse**.

Community Receptors

Co1 (10 m east)

St. Andrews National School is located directly to the east of the site. It is a three-storey building.

Sensitivity - Receptors would be staff and students at the school. Sensitivity is low.

Magnitude - It is angled in an east-west direction with direct views of the site to the west and a green field to the east. It has two basketball courts that overlook the access road with views that are obscured by a treeline and a wall. During construction, visual clutter is likely to be higher from machinery. Following completion of the project some views of the tallest elements of the development may be visible although these views will be partially screened by the treeline proposed for the entire perimeter the effect will remain negative. The magnitude of change will therefore be medium.

Effect - In accordance with Table 11-1Table 11-2 the visual impact will therefore be **permanent, slight, adverse**.

Co2 (10 m west)

The Village Montessori Preschool is located directly west of the site, separated by a small lane and wall. All buildings are single storey.

Sensitivity - Receptors would be staff and students at the school. Sensitivity is low.

Magnitude - The wall will obscure some views, however, during construction tall machinery will be directly visible from some parts of the building, as there are no trees located along the western boundary of the site. Once operational, tallest elements of the development will be visible which will create a negative effect. Proposed tree planting will also form part of views and partially screen these built elements; however, the change will have a negative effect. The highest magnitude of change will be low.

Effect -. Therefore, in accordance with Table 11-1Table 11-2 the visual effect during construction will be **short-term, slight, adverse** becoming **permanent, imperceptible, adverse** once operational.

Co3 (25 m south)

St. Marys Church and adjoining mission house are located along the Lucan Road after it forks into Chapel Hill. It faces northwest overlooking a large public car park for the area.

Sensitivity - Receptors would be staff, visitors and church goers and church staff residing in the mission house. Sensitivity is low to high.

Magnitude - Views from the church face northwest and southeast, while northeast views towards the site are fully obscured by the mission house and some deciduous trees at the front of the church also provide seasonal visibility obstruction. The church windows provide little visibility as they are positioned high. The carpark provides no screening, however, the bend of the road and mission house to the east restrict direct views. Views from windows facing northeast closest to the Lucan Road are more direct. There is a line of deciduous trees to the east of the mission house that will provide seasonal obstruction of views from windows further away from the Lucan Road.

The proposed development will therefore be visible through northeastern views for some parts of the mission house. The magnitude of change for residents of the mission house will be low.

Effect - In accordance with Table 11-1Table 11-2 the visual impact during construction will be **short-term, slight, adverse**, and following construction will be **permanent, imperceptible - slight, adverse**.

Co4 (90 - 350 m)

Scoll Mhuire National Girls School and St. Josephs College are located along Lucan Road further south, southwest of St. Marys Church (Co3). The buildings are oriented in a northwest-southeast direction, and views are generally the same with some views from perpendicular windows towards the development.

Sensitivity - Receptors would be staff and students at the school. Sensitivity is low.

Magnitude - The schools are situated along a more pronounced curve of the Lucan road. Receptor group Co3 obscures most northeastern views, however, from second storey windows facing the Lucan road some angled and filtered views of the development may be visible. The overall magnitude of change is low.

Effect - In accordance with Table 11-1Table 11-2 the visual impact of the development during construction will be **short-term, slight, adverse**, and **permanent, imperceptible, adverse** once operational.

Co5 (130 - 340 m southwest)

St. Mary's Boys National School is located along Chapel Hill (L1005). The main school building is 3-stories with adjoining 2-storey buildings to the north and east. There is a parking lot to the front.

Sensitivity - Receptors would be staff and students at the school. Sensitivity is low.

Magnitude - The buildings are oriented in a north-south direction with views facing the same direction. There is woodland along Chapel Hill to the east which forms part of the Liffey pNHA surrounding the proposed development site. This almost completely effectively screens views of the site. The magnitude of change will be negligible.

Effect - In accordance with Table 11-1Table 11-2 the visual impact of the development during construction will be **short-term, imperceptible, adverse** and operation will be **permanent, imperceptible, adverse**.

Commercial Receptors

C1 (12 m south)

Directly south of the site, located along Lucan Road, are several two-storey residential properties that are used as commercial buildings including Pieta House Lucan, Declan J.O'Connell & Co. Solicitors and a computer repair business. Pieta House is a suicide support service. A couple of the properties have trees in the front garden.

Sensitivity - Receptors would be staff at work and clientele of the businesses. Sensitivity is low. Visitors of Pieta House are receptors of higher sensitivity due to the sensitive nature of the services provided. Sensitivity is medium.

Magnitude - The proposed development would create a prominent change in views from these premises. There are no trees along the wall bounding the site, so views are clear and direct except for properties with trees in the front garden. In accordance with the methodology the magnitude of change will be low.

Effect - In accordance with Table 11-1Table 11-2 the visual effect would be short-term, slight, negative during construction. Highest points of the development may be visible from second storey views but will be partially screened by the treeline. The visual effect will be **permanent, slight, adverse**.

C2 (90 m southwest)

Cunnings Funeral Home is located along Lucan Road to the southwest of the site. There is an adjoining property to the west and the premises is bounded by trees to the west and north. A large carpark is directly adjacent to the east of the premises.

Sensitivity - Receptors would be staff at work. Sensitivity is low.

Magnitude - The building faces east, and views across the carpark are unobstructed. The magnitude of change that the proposed development would create would be low.

Effect - Tall elements of the development would be seen from the premises, however, the treeline will partially screen this. During construction the visual effect will be **short-term, slight, adverse** becoming **permanent, slight, adverse** following completion in accordance with Table 11-1Table 11-2.

C3 (250 - 540 m)

A string of 2 -storey commercial premises are situated along Chapel Hill and main street after the roundabout between Chapel Hill, Main Street and the Lower Lucan Road bridge.

Sensitivity - Receptors would be staff at work. Sensitivity is low.

Magnitude - Views along Chapel Hill and Main street further west are obstructed by buildings and small wooded areas along Chapel Hill to the east closer to the development site. The magnitude of change would be low.

Effect - In accordance with Table 11-1Table 11-2 the visual effect would be **permanent, imperceptible, adverse**.

C4 (480 - 660 m southwest)

A terrace of 3-storey buildings has been converted into businesses including Lucan Credit Union and Permanent TSB which are situated between the Lucan Bridge to the east, the Liffey River to the north, Main Street to the south and a wooded area with open space to the west.

Sensitivity - Receptors would be staff at work. Sensitivity is low.

Magnitude - Similar to C3 views are obstructed by woodland and R6. The magnitude of change is low.

Effect - In accordance with Table 11-1Table 11-2 the visual effect will be **permanent, imperceptible, adverse**.

C5 (115 - 480 m west)

A collection of commercial and industrial premises with small internal roads, car parks and bare yards are located along the Lower Lucan Road (R121).

Sensitivity - Receptors would be staff at work. Sensitivity is low.

Magnitude - Riparian vegetation along the western and eastern banks of the Liffey and the woodland along the western boundary of St. Edmundsbury Estate obstructs eastern and western views from these premises. A treeline is present along majority of the Lower Lucan Road also which provides further screening. The magnitude of change will be negligible.

Effect - In accordance with Table 11-1Table 11-2 the visual effect will be **permanent, imperceptible, adverse**.

Open Space Receptors

OS1 (10 - 620 m north, northeast and east)

There are large arable fields in the immediate site surrounds to the north and east with walkways that adjoin with the access roads and provide a link to the Liffey Valley woodland. The northern section of the field to the north is included in the Liffey Valley SAAO.

Sensitivity - Receptors would be residents walking. Sensitivity is high.

Magnitude - The fields and walkways descend away from the estate and there is a marginal difference in elevation. This difference in elevation and the woodland surrounding the estate obstruct views. The magnitude of the change would be negligible.

Effect - The visual effect will be **short-term, slight, adverse** during construction and **permanent, imperceptible, adverse** during operation.

OS2 (350 - 910 m west)

Laraghcon Park is a large open space in the form of a gently sloping hill encompassed by an eastern border of woodland that separates the park from C5. Small groups and single trees are also present throughout the park.

Sensitivity - Receptors would be residents of Laraghcon estate. Sensitivity is high.

Magnitude - Views of the proposed development are generally obstructed by the surrounding woodlands of the estate, the riparian woodland and the eastern boundary woodland. At the highest point of the park some machinery may be visible during construction. The magnitude of change will be negligible.

Effect - The visual effect will be **short-term, slight, adverse** during construction and **permanent, imperceptible, adverse** during operation.

OS3 (250 - 400 m south)

A green area is situated in the Lucan Heights estate with a perimeter of trees.

Sensitivity - Receptor would be residents of Lucan Heights. Sensitivity is high.

Magnitude - Views of the development site are generally obstructed, however, tallest elements during construction may be visible through gaps between houses. The magnitude of change will therefore be low.

Effect - In accordance with Table 11-1Table 11-2 the visual effect will be **short-term, slight, adverse** during construction, becoming **permanent, imperceptible, adverse** during operation.

OS4 (250 - 650m southwest)

Sarsfield Park is a long, thin open space forming part of Sarsfield Estate. There is a gentle gradient from the treeline separating the park from the Lucan Road. A small play area for children is located in the centre of the park.

Sensitivity - Receptors would be residents of Sarsfield Estate. Sensitivity is high.

Magnitude - The gradient renders the park below the level of the development and views are entirely obstructed by the treeline. The magnitude of change will be negligible.

Effect - In accordance with Table 11-1Table 11-2 the visual effect will be **permanent, imperceptible, adverse**.

11.3.2.2 Protected Views and Prospects

The sensitivity of significant views and designated prospects is high. There are three views within 1km of the proposed development. Two are located at the weir along Barnhill Cross Road facing southeast towards the development and the other along Lucan bridge facing west, away from the development. The two views facing towards the development are situated on a decline in elevation away from the development site. Any visibility of the site will have a negative effect on the views, however, this is not anticipated to be significant. The views are already situated in a mixed landscape of urban and natural features. Trees along Lucan Bridge and Chapel Hill provide screening. During the winter months, this screening may be diminished, however, the magnitude of change likely to arise from the development is negligible. In accordance with Table 11-1Table 11-2 the visual effect will be permanent, imperceptible, negative.

11.3.2.3 Photomontages (see Appendix 11)

Photomontage V1 - This photomontage shows the view from the proposed biodiversity pond where the private hospital road meets the public access walkway. The main hospital building is almost fully screened by trees and the adolescent unit is partially screened. The presence of the proposed biodiversity pond has a positive effect on the view compared to the grassy area prior to the development. However, tree removal lowers the density of tree cover. The visual effect on this view will be permanent, slight, negative.

Photomontage V2 - This photomontage depicts the northwestern view from R835 (Lucan Road). The screening provided by a large, mature tree is removed and views to the main hospital building are clear. The visual effect on this view will be permanent, slight, negative.

Photomontage V3 - This photomontage shows the direct north facing view towards the site from the opposite side of R835. The magnitude of change for this view is the most significant. The hospital building is clearly visible over the masonry walls. The presence of several trees in the view somewhat softens the stark presence of the building. The visual effect on this view is anticipated to be permanent, slight, negative.

Photomontage V4 - This photomontage shows east facing views from Chapel Hill (L1005). The proposed development is partially screened by the wall and proposed tree planting. The road declines as it moves further away from the development and this change in elevation screens view further. The visual effect on this view is expected to be permanent, slight, negative.

11.4 Mitigation

The design incorporates elements that contribute to the current assessment and should be implemented as designed for its validity. These include:

- New structural tree and woodland planting along the Lucan Road frontage, the eastern access route adjoining St Andrew's National School and the western boundary towards The Village Montessori Preschool. This planting will, as it establishes, provide partial screening and filtering of views of the proposed buildings, car parks and access roads and will help to re-create a strong vegetated edge in place of the existing overgrown hedgerow where removal is required.
- Reinforcement of internal estate planting, including avenue trees, woodland edge planting and native hedgerows that reflect historic field boundaries. This will help to integrate the new buildings into the established estate structure, soften the transition between built and open areas and enhance biodiversity.
- Careful design of external materials, colours and boundary treatments, with a preference for muted, recessive finishes and natural materials that sit comfortably within the woodland setting and reduce contrast in views from surrounding receptors.
- Sensitive external lighting design, to avoid unnecessary light spill into the surrounding woodland and Liffey Valley and to minimise night-time visual intrusion, while maintaining safe levels of illumination within the campus.

The above measures have been taken into account in the assessment of effects. No further specific landscape or visual mitigation is considered necessary to reduce significant effects, as no significant adverse landscape or visual effects have been identified.

11.5 Residual Effects

Overall, taking account of the design-led mitigation and proposed planting, no significant residual landscape or visual effects are predicted for any receptor group during either the construction or operational phases of the proposed development. The assessment of the effects remains the same as the assessment described in Section 4 of this report.

11.6 Interactions

Landscape and Visual and Biodiversity - Tree and hedge planting enhancing screening, helping retain existing field boundary form,

Landscape and Visual and Cultural Heritage - NIAH records to be retained, protected and incorporated/ showcased in the design of the building adding to the amenity offered by the proposed development.

11.7 Cumulative Assessment

The cumulative assessment considers the potential for additional landscape and visual effects to arise from the proposed development in combination with other existing, permitted or under-construction developments in the surrounding area. The cumulative study area has been defined as a 0.5 km radius from the proposed development boundary, which is proportionate to the height and extent of the proposed buildings and the enclosed character of the Liffey Valley landscape in this location.

A desktop review of planning records and site observations identified a number of small-scale residential, commercial and industrial developments within the wider area. Most of these comprise minor extensions, lighting proposals or alterations at individual property scale and are not of a nature or scale likely to give rise to notable cumulative effects when considered with the proposed development.

Two permitted developments within or close to the 0.5 km radius have been identified as having the greatest potential to contribute to cumulative effects:

- SD16A/0072/EP – demolition of existing single and two-storey post-primary school buildings and construction of a part two, part three-storey post-primary school extension at Saint Joseph's College and Scoil Mhuire Girls National School on Lucan Road. At the time of survey, works were ongoing and a crane was present on site.

- SD18A/0429 – demolition of a one-storey warehouse building at Millbank Business Park and construction of nine three-storey residential houses.

Both of these schemes are modest in scale relative to the wider Liffey Valley Landscape Character Area and are located within or immediately adjacent to the existing built fabric along the Lucan Road / Chapel Hill corridor and the Millbank area to the west of the River Liffey.

11.7.1 Cumulative Landscape Effect Assessment

Individually, the permitted school extension and the small residential scheme at Millbank represent incremental intensification within areas that are already characterised by built development. They do not alter the underlying pattern of the Liffey Valley Landscape Character Area, which comprises a mosaic of riparian woodland, agricultural land and historic and modern urban areas.

The proposed development will consolidate healthcare and related uses within the established St Edmundsbury estate, largely contained within the existing woodland framework and former walled garden and read as part of the existing cluster of institutional and residential development along the Lucan Road. In combination with the other identified schemes, it will contribute to a modest increase in the extent of built form within the urban edge of the Liffey Valley but will not diminish the dominance of riparian woodland, topography and open space as the defining landscape characteristics of the valley.

Given the medium to high sensitivity of the Liffey Valley Landscape Character Area and the limited geographic extent and scale of change introduced by the identified cumulative schemes, the cumulative magnitude of change to landscape character is assessed as low. This results in a slight, not significant cumulative effect on the wider Liffey Valley Landscape Character Area and on the local estate landscape of St Edmundsbury. The key woodland corridors, estate structures and open space pattern are retained and reinforced through the proposed landscape framework and therefore no significant adverse cumulative landscape effects are predicted.

11.7.2 Cumulative Visual Effect Assessment

Cumulative visual effects may arise where the proposed development is experienced in combination with the other identified schemes from the same viewpoint (“combined visibility”) or where these developments are seen in succession along a route or across an area (“sequential effects”).

Combined visibility is most likely to occur for receptors along the Lucan Road and Chapel Hill where there is existing intervisibility with both the St Edmundsbury estate and the school complex to the south-west, and for a limited number of receptors in the Millbank area west of the River Liffey. However, views are heavily filtered and contained by existing and proposed tree cover, local topography and intervening built form. In these views the proposed development will be read as part of the existing pattern of institutional and residential buildings along the road corridor, with the school extension and Millbank housing largely perceived as separate, small-scale elements within the wider urban backdrop. The cumulative magnitude of visual change at these receptors is therefore low or negligible, resulting in cumulative effects that are slight or imperceptible and not significant.

Sequential effects may occur for people travelling along Lucan Road, Chapel Hill and the local walking routes that connect through the Liffey Valley woodland and agricultural lands. Along these routes, views of the proposed development will be experienced intermittently, in combination with glimpses of existing residential areas, schools and commercial development. The permitted school extension and Millbank residential scheme will appear as small additional built elements within this sequence. The proposed development will be experienced mainly at the point where the Lucan Road passes the main St Edmundsbury entrance and from short sections of Chapel Hill, with tree cover and walls providing partial screening and filtering of views. As distance from the site increases the proposed development will appear smaller within the experienced view and the magnitude of change to the view is therefore further reduced. Overall, sequential cumulative effects are assessed as slight or imperceptible and not significant for road users and recreational walkers.

No additional developments of a scale or proximity likely to give rise to significant cumulative landscape or visual effects have been identified within the defined study area. On this basis, no significant cumulative effects on landscape character or visual amenity are predicted as a result of the proposed development in combination with other known projects.

11.8 Difficulties encountered in compiling this Information

No difficulties were encountered during the compilation of this information.

12 Interactions

12.1 Introduction

The EIA Directive (2014/52/EU) requires a description of:

‘the interaction between any of the foregoing aspects’.

Interactions can occur when a predicted impact causes interaction or dependency with other environmental aspects. This section discusses the interactions between aspects and assesses them as positive, Adverse or neutral (as having no interaction or interdependency).

The interactions of environmental effects were considered throughout the design development for the proposed development and adjustment were made to the design of the layout to mitigate impacts arising from these interactions.

Potential impacts that may arise as a result of relationships between sensitive receptors within and outside of the site will be addressed in the EIAR and AA Screening, particularly those on ecological receptors due to the proximity of the woodland and pNHA to the proposed works.

Guidance for the assessment of indirect and cumulative impacts, as well as impact interactions will be taken from the European Commission document: Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (Walker and Johnston 1999) and Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland (CIEEM 2016 and 2006).

Interactions between certain environmental aspects are illustrated in Table 12-1 and discussed in the sections below.

Table 12-1: Interactions between environmental aspects and significance of impacts

Interaction	Population and Human Health		Biodiversity		Land and Soil		Water		Air and Climate		Noise and Vibration		Material Assets		Cultural Heritage		Landscape and Visual Amenity	
	Con	Op.	Con	Op.	Con	Op.	Con	Op.	Con	Op.	Con	Op.	Con	Op.	Con	Op.	Con	Op.
Population and Human Health			✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✓	✗	✗	✗	✗	✗
Biodiversity					✓	✗	✓	✗	✗	✗	✓	✗	✗	✗	✓	✗	✗	✗
Land and Soil							✓	✗	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗
Water									✗	✗	✗	✗	✓	✗	✗	✗	✗	✗
Air and Climate											✓	✗	✗	✗	✗	✗	✗	✗
Noise and Vibration													✗	✗	✗	✗	✗	✗
Material Assets															✗	✗	✗	✗
Cultural Heritage																	✗	✓
Landscape and Visual Amenity																		

Con.	Construction Phase	✗	No Interaction	✓	Imperceptible
Op.	Operational Phase	✓	Not Significant	✓	Slight

12.2 Population and Human Health and Material Assets

Material Assets discussed in Chapter 9: Impacts to material assets, in particular to utilities or roads, traffic, and transport, could lead to interactions with population and human health if significant or allowed to go on for a long time. This is unlikely to occur given the nature of the proposed works and likely short length of disruptions to utilities. Impacts on population and human health due to material assets impacts are likely to be **Temporary, Slight, Adverse**.

12.3 Population and Human Health and Air quality, Noise and Vibration

Air quality, Noise and Vibration discussed in Chapters 7 and 8: Excessive noise or vibration during construction can cause disturbance to human health to residents the surrounding area. Mitigation measures outlined in the Construction Impacts chapter will ensure that the impact of noise and vibration on population and human health will be **Temporary, Not Significant, Adverse**.

12.4 Biodiversity and Water; Land, Soils and Geology; Climate (Climate Change); Material Assets (Waste); and Materials Assets (Transport)

Construction Stage -There are potential interactions between waste management and water environment which can have a potential impact on key ecological receptors during construction. This includes the removal of invasive species during the construction stage, which involves collected waste biomass (pulled stems/roots and bagged flower heads). If this biomass is not disposed of appropriately at a facility authorized to accept such waste, it has the potential to spread further within the surrounding environment, including within the River Liffey Valley pNHA. Such spreading events can have adverse impacts on high value habitats, such as the adjacent woodland habitat, displacing native species. These potential interactions also include the removal of nutrient-rich topsoil during the construction phase, which if not removed/stored effectively, has the potential to be transported by surface water run-off into the River Liffey, either directly or via the drainage ditch to the north of the site. This has the potential to increase water turbidity which can hinder light penetration and negatively affect macrophytes. Additionally, accidental pollutant spills (hydrocarbons and solvents) can negatively affect local aquatic flora and fauna upon entering the drainage ditch and/or downstream River Liffey. The mitigation measures outlined in Chapters 4 (Biodiversity) and 6 (Water), including the use of silt fences and settlement trains during construction, will ensure effects on habitats, flora, and fauna from water and hydrology will be not significant.

Operational Stage -The operational stage interactions are due to the potential for surface water run-off due to the introduction of additional artificial surfaces within the site. The proposed drainage design includes the adoption of SuDS for surface water collection and attenuation, which will provide environmental benefits, e.g., retention of urban run-off. SuDS are designed to manage stormwater locally to mimic natural drainage and encourage its infiltration, attenuation and passive treatment, which is increasingly important given potential effects of future climate change. The SuDS proposed around the development site include surface water detention/attenuation tanks, permeable paving, green roofs, bioretention areas, and the creation of a pond/wetland area. These SuDS features will collectively provide surface water run-off attenuation, infiltration, and in-situ retention of sediments (and associated nutrients), metals, and hydrocarbons, ensuring no pollution-based degradation of other terrestrial habitats within the locality. The vegetation within the SuDS will provide refuge and foraging opportunities for a range of terrestrial and aquatic invertebrates, which will have knock-on benefits for local bird, bat, amphibian, and mammal populations.

12.5 Biodiversity and Air, Noise and Vibration and Material Assets (Transport)

Construction Stage -During the construction stage, the biodiversity assessment has examined how key ecological receptors, such as species and habitats, interact with various environmental factors. Specifically, there is an interaction between traffic and transport and mortality risk for species. Airborne noise from construction activities, including vehicles, can interact with biodiversity as any increase in noise levels has the potential to impact on sensitive ecological receptors. An example of this interaction is the direct and indirect impacts likely to occur on the foraging and commuting activities of local mammals (Badger, Hedgehog, Pine Marten), bats and birds located within the woodland habitat, resulting from the temporary noise and vibration pollution during this stage. Further, noise generated by the construction works has the potential to effect breeding bird species egg production, incubation, brooding, predators, brood parasites, and abandonment, as well as the ability to find or attract a mate and the ability of parents to hear and respond to begging calls of

their offspring. While the mitigation measures outlined in the Chapter 4 (Biodiversity) will reduce these impacts by limiting works to the daytime hours and erecting protective hoarding around the retained woodland habitat, disturbance levels during the construction phase will still cause **temporary adverse impacts** upon local fauna.

Operational Stage Operational interaction impacts among Biodiversity, Noise and Vibration, and Traffic and Transport are likely to occur given the increased usage of the site, with higher numbers of vehicles and people present within the proposed site. All faunal species will be subjected to increase noise levels (disturbance), as well as ground-dwelling fauna, and some less agile and/or reactionary bird species also seeing their risk of collision injuries and fatalities increase as a result of the hospital's operation and the anticipated increase in vehicles locally

12.6 Biodiversity; Water; Air (Dust, Sunlight & Daylight); Climate (Air Quality); and Landscape and Visual

Construction Stage There is an interaction between water, air quality and biodiversity, as any reduction in the quality of surface water or in air quality can contribute to habitat degradation and have knock-on impacts for faunal and floral species. Air (emissions and dust) pollution generated during the construction stage has the potential to adversely impact watercourses (airborne emissions), photosynthesis and the biological functions (dusts) of valued flora and fauna. Additionally, air (sunlight & daylight) interacts with biodiversity during the construction stage as a result of changes to landscape (woodland clearance) will ultimately change the (sun) lighting regime for flora within the retained habitats on-site. This will have a **slight impact** on a subset of the more light/shading sensitive flora.

Operational Stage During the Operational Phase, there will be an interaction between landscape and biodiversity. As outlined in Chapter 11 (Landscape & Visual), the proposed project will include replanting with native species, where possible. Air (sunlight & daylight) will interact with biodiversity during the operational stage as a result of changes to landscape (removal of scrub and trees, along with the planting of new trees and shrub, and the construction of new buildings within the site) will change the (sun) lighting regime for flora within the adjacent habitats. This will have a **slight impact** on a small proportion of the more light/shading sensitive flora.

12.7 Biodiversity, Land, Soils and Geology, and Material Assets (Utilities)

Construction Stage The impact of earth works, land take (habitat loss) and woodland removal for the proposed hospital on local biodiversity will be the most notable impact on biodiversity as a result of the proposed development. Loss of soil value from construction activities and use of unsuitable soil material may affect biodiversity. There is an interaction between soils and geology and biodiversity, as non-native invasive plant species can be spread through soils and can also contribute to habitat degradation. There will be an interaction between utilities and biodiversity, with the provision of construction-based lighting impacting on light-sensitive fauna. The connection of operational lighting fixtures to the electricity network will require excavations, which can spread non-native invasive plant species, contributing to habitat degradation. The mitigation measures outlined in Chapter 4 (Biodiversity), including the retention of excavated topsoil from the meadow habitat, erection of hoarding around retained habitats, suitable construction-based lighting guidance, and construction phase monitoring of invasive species and lighting disturbance on local fauna, which will limit short-term adverse impacts on local fauna. However, **a permanent adverse impact of moderate** significance is anticipated for the woodland habitat given the removal of a section of this habitat.

Operational Stage Given the long-term nature of the land take (habitat loss) this negative impact / interaction is carried forward to the operational stage of the hospital. There will also be a long-term negative impact / interaction between biodiversity and utilities, with the provision of operational lighting adversely impacting local light-sensitive fauna. While the topsoil layer and saplings from the woodland area due for removal will be translocated during the construction phase, as detailed in Chapter 4 (Biodiversity), the success rate of woodland translocation is mixed, and takes an extended period to determine (in excess of 10 years) its success. As such, a **moderate adverse permanent impact** on the woodland habitat will be carried forward into the operational phase.

12.8 Biodiversity and Cultural Heritage (Archaeological & Architectural)

Construction Stage There will be an interaction between Biodiversity and Cultural Heritage (Archaeological & Architectural) during the construction phase, as the proposed

refurbishment/demolition of the existing historical structures on site, including the stonewalls, will lead to a loss in refugia for local fauna and the removal of the existing flora. The presence of an on-site ECoW as well as the completion of pre-enabling/construction phase checks of the historical structures on site, as described in Chapter 4 (Biodiversity), will limit the risk of direct disturbance/injury to local fauna utilising these structures. Additionally, in the event archaeological remains are identified during the stripping of topsoil during the construction phase, additional impacts on biodiversity may occur. If this scenario arises, the significance of effect on biodiversity would be determined by the nature and extent of works required.

Operational Stage In the event that the discovery of archaeological remains results in further investigation into habitats that are set to be retained, this will lead to additional ecological lag, limiting ecological functionality within the sites, as a result of the required reinstatement of habitats following archaeological investigations.

12.9 Land and Soils and Surface Water

Effects of the proposed development on surface water are linked with effects on groundwater and hydrogeology. Run-off from the site may be intercepted by vegetation that protects surface water. However, the run-off may affect the soil supporting the riparian woodland. Chemicals or suspended solids may affect soil fertility and quality therefore having a negative effect on surrounding vegetation that is protected under the SAAO. Reduced soil quality adjacent to surface water bodies may increase the likelihood of surface water contamination. Without mitigation, this interaction could result in a **short-term, significant, adverse effect**. Mitigation measures outlined in this chapter and EIAR Chapter 6 will reduce the likelihood of such interaction decreasing the effect to **temporary, slight, adverse**.

12.10 Land and Soils and Biodiversity

Interactions between soils, geology, and biodiversity can occur through surface, groundwater, and air pathways, which poses a risk of contamination via surface water run-off, dewatered groundwater, and soil erosion. Introduction of contaminants and suspended solids could lead to habitat degradation of the adjacent habitats or downstream groundwater or surface water receptors.

With the implementation of mitigation measures outlined in this chapter and Chapter 8, potential impacts through interaction would be **short-term, imperceptible, not significant**.

12.11 Water and Biodiversity

Effects on water quality, hydrology and hydrogeology can have further effects on biodiversity and ecology, through the mobilisation of silts, dusts, suspended solids, oils, or chemicals. On entering watercourses, these can negatively affect fish and aquatic ecology, as well as have an effect on Natura 2000 sites further downstream. These effects are further discussed in the Biodiversity chapter 4 of this EIAR. While the proposed development site is not directly connected to the River Liffey or other watercourses, surface water can make its way there through drainage networks. Following implementation of mitigation measures outlined in this chapter, including the use of silt fences and settlement trains during construction, effects on habitats, flora, and fauna from water and hydrology will be **Short-term, Imperceptible, Neutral**.

12.12 Water and Material Assets

The material assets on site (surface and stormwater drainage) are assessed in Chapter 9. The potential for effects on water and hydrology from these assets has been assessed in this chapter. Due to the intricate design of the surface water and stormwater drainage systems, any interaction between material assets and water will be **Long-term, Imperceptible, Neutral**.

Construction vehicles moving on site during the construction phase could result in hydrocarbons entering the surface water drainage system, leading to effects downstream. This is mitigated against by measures included in this chapter and the project CMP (Egis Ltd), which outline the site compound location (away from any drains) and require all vehicles to be maintained frequently and to carry spill kits at all times. Without mitigation in place, this could lead to a temporary significant negative effect. However, with the measures outlined in this chapter, the interaction between these will be **Temporary, Imperceptible, Neutral**.

There is potential for an increase in frequency of rainfall in the future as a result of climate change. This will result in greater pluvial flooding risk at the site, as stated in Chapters 7 (Air and Climate) and 8 (Noise and Vibration). The drainage and layout design include adequate attenuation and drainage to account for climate change effects. Therefore, the effects will be **localised and Long-term, Imperceptible, Neutral**.

12.13 Air and Climate and Biodiversity

Earthworks during the construction phase have the potential to give rise to dust impacts, potentially giving rise to impacts on flora and fauna. The mitigation measures that will be put in place at the proposed development site will ensure that the impact of the proposed development complies with environmental legislation and therefore during the construction phase, the predicted impact through interaction would be **Temporary, Imperceptible, Not Significant**. In terms of the operational phase, the predicted impact through interaction would be **Long-term, Imperceptible, Neutral**.

12.14 Air and Climate and Population and Human Health

An adverse air quality impact in either the construction or operational phase has the potential to cause health and dust nuisance issues. The mitigation measures that will be put in place at the proposed development site will ensure that the impact of the proposed development complies with all ambient air quality legislative limits and therefore the predicted impact would be **Short-term, Adverse, Not Significant** with respect to the construction phase. In terms of the operation phase, the predicted impact would be **Long-term, Imperceptible, Neutral** with respect to the operational phase in terms of human health impacts. The development has been shown to be not significant in terms of air quality.

12.15 Air and Climate and Material Assets

Interactions between air quality and traffic can be significant. With increased traffic movements and reduced engine efficiency due to traffic congestion, the emissions from vehicles may increase. The impacts of the proposed development on air quality have been assessed by reviewing the change in annual average daily traffic flows on roads close to the site. In this assessment, the impact of the interactions between traffic and air quality are considered to be **Short-term, Adverse, Not Significant**. During operation, the predicted impacts would be **Long-term, Imperceptible, Not Significant**.

Mitigation of combined effects is best achieved through management and control measures to prevent the individual impacts in the first instance or reduce the impacts and therefore reduce the likelihood of such interactions occurring.

With the appropriate mitigation measures to prevent fugitive dust emissions during construction, it is predicted that interactions between Air Quality with Biodiversity and Population and Human Health will be **Short-term, Imperceptible, Not Significant**.

All mitigation measures outlined in the respective chapters of this EIAR will be implemented in full to ensure the potential impact is minimised in relation to construction and operational impacts.

12.16 Noise and Population and Human Health

An adverse noise impact in either the construction or operational phase has the potential to cause noise nuisance issues. The construction phase noise mitigation measures that will be put in place at the proposed development site will ensure that the construction noise levels are in accordance with relevant guidelines and suggested construction phase noise limits at nearby residential properties. Therefore, the predicted construction phase noise impact through interaction will be **Temporary, Adverse, Not Significant**. During operation, the predicted impact would be **Long-term, Neutral, Not Significant**.

12.17 Noise and Biodiversity

Noise and vibration have the potential for direct impacts on the surrounding fauna, particularly during the construction phase. The construction phase noise mitigation measures that will be put in place at the proposed development site will ensure that the construction noise levels are in accordance with relevant guidelines and suggested construction phase noise limits. The construction phase impacts through interaction are predicted to be **Temporary, Slight, Not**

Significant. During operation, the impacts are predicted to be **Long-term, Imperceptible, Not Significant.**

12.18 Noise and Material Assets

Interactions between noise and traffic can be significant. The impacts of the proposed development on traffic noise levels have been assessed by reviewing the change in annual average daily traffic flows on the surrounding road network. In this assessment, the impact of the interactions between traffic and noise are considered to be **Temporary, Adverse, Not Significant**. In terms of the operation phase, the predicted noise impacts would be **Long-term, Adverse, Not Significant** with respect to the operational phase in terms of noise impacts at nearby residential properties.

Mitigation of combined effects is best achieved through management and control measures to prevent the individual impacts in the first instance or reduce the impacts and therefore reduce the likelihood of such interactions occurring.

With the appropriate noise mitigation measures during construction, it is predicted that interactions between Noise and Population and Human Health not be significant.

All mitigation measures outlined in the respective chapters of this EIAR will be implemented in full to ensure the potential impact is minimised in relation to construction and operational impacts.

12.19 Material assets (Traffic) and Water

Construction vehicles moving on site during the construction phase will result in hydrocarbons entering the surface water drainage system, leading to effects downstream. This is mitigated against by measures included in the CEMP, which outline the site compound location (away from any drains) and require all vehicles to be maintained frequently and to carry spill kits at all times. Without mitigation in place, this could lead to a temporary significant negative effect. However, with the measures outlined in this chapter and the CEMP, the interaction between these will be **Temporary, Imperceptible, Neutral**.

Due to the design of surface and stormwater drainage being in accordance with SuDS and the Greater Dublin Strategic Drainage Study, any interaction between material assets and water will be **Long-term, Imperceptible, Neutral**. Localised disruption of utilities will be during the connection of services

12.20 Cultural Heritage and Landscape and Visual

NIAH records to be retained, protected and incorporated/ showcased in the design of the building interact **positively** with the amenity offered by the proposed development.

12.21 Cultural Heritage and Biodiversity

There will be an interaction between Cultural Heritage and Biodiversity during the construction phase, as the proposed refurbishment/demolition of the existing historical structures on site, including the stonewalls, will lead to the removal of the existing flora, this will be **Short-term Adverse**. In the event archaeological remains are identified during the stripping of topsoil during the construction phase, additional impacts on biodiversity may occur.

12.22 Landscape and Visual and Biodiversity

Tree and hedge planting enhancing screening, this will be a **Long Term Positive** effect and will help to retain existing field boundary form,

13 Cumulative Impacts

13.1 Introduction

The cumulative impacts of the proposed development together with other existing and proposed projects will be addressed in the EIAR. The proposed projects that will be considered will be compiled at the time of the EIAR. However, a summary of available recent planning applications at the time of writing of the EIAR Scoping Report on adjoining lands is shown below. These largely relate to applications associated with the adjoining St. Andrew's National School and the Canon Despard Centre, and proposed residential development applications to the south of Lucan Road, near the site access.

Any predicted cumulative effects arising from the proposed development in combination with other existing, planned and permitted projects are set out in the various chapters throughout this EIAR. Figure 13-1 and

Table 13-1 below provide summary details of the projects/developments that have the potential to impact resources, traffic, or the local area, and so could have potential cumulative effects with the proposed flood relief scheme.

Only those projects whose duration of permission overlaps with the likely construction period of the proposed development (i.e., 2026 onwards) are included. Small developments such as house extensions and alterations, or the construction of a single dwelling or structure, have been excluded as the likely effects of such developments will not be significant, except where they are taking place adjacent to or in close proximity to the proposed defences.

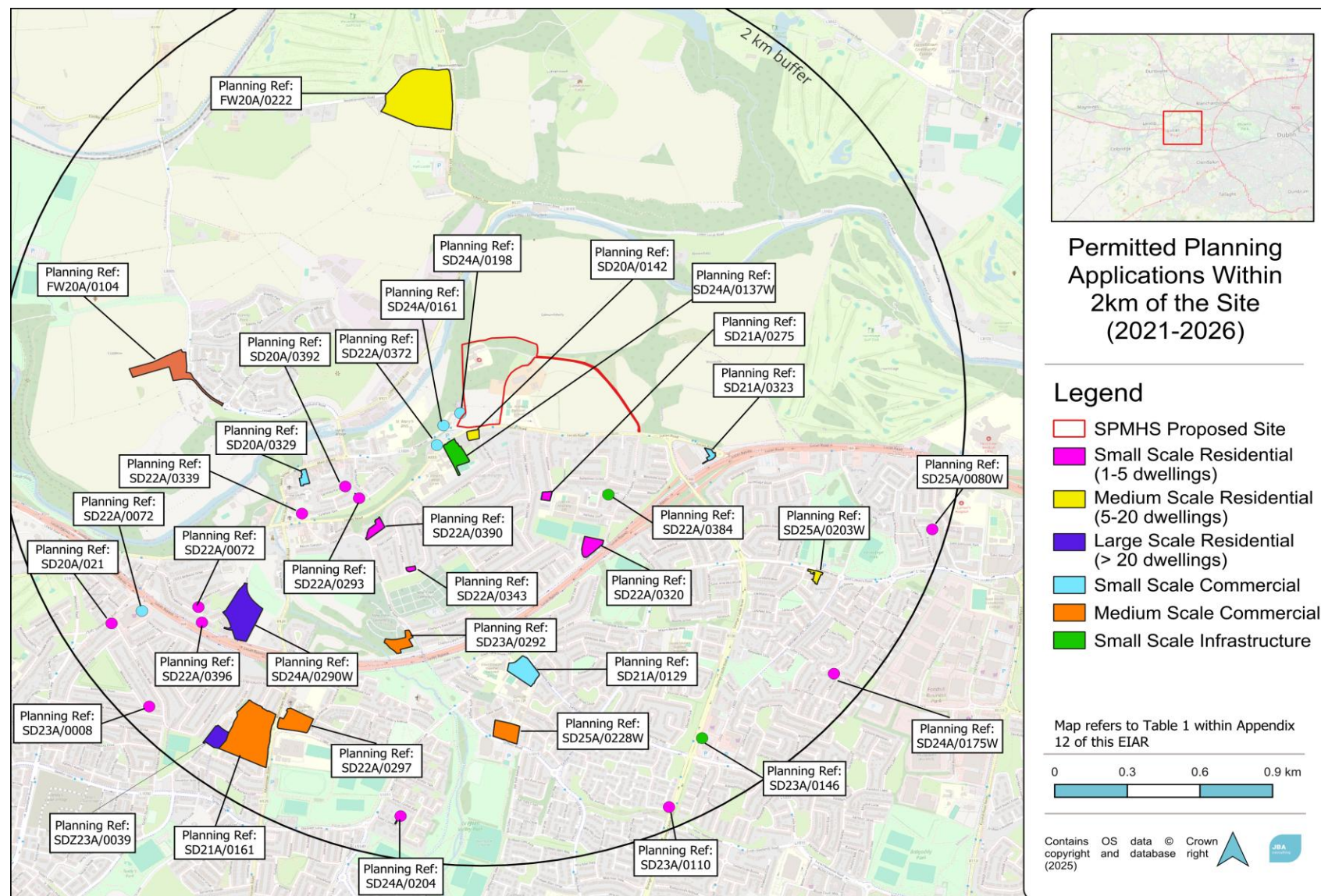


Figure 13-1: Cumulative Impacts from Permitted Development within 2km of site

Table 13-1: Recent planning applications in the vicinity of the proposed development

Planning REF	Applicant	Development	Decision
SDZ23A/0039	Stephen Little & Associates	68 no. apartment units (49 no. 1 beds and 19 no. 2 beds) in a single block ranging in height from 4 to 5 storeys (Block 2); All associated and ancillary site development, infrastructural and landscape works, including:- reconfiguration of car parking along part of Somerton Gate and provision of new road and car parking layout to south and east of Block 2 resulting in an increase of 12 no. car parking spaces (77 no. in total); Provision of a secure bicycle parking facility (93 no. spaces) to the east of Block 2 and additional visitor bicycle parking (36 no. spaces) to the west of Block 2 (129 no. in total); Reconfiguration of permitted bin store adjoining Block 1 to provide a smaller bin store and new plant room; Revised landscaping layout to east of Block 2; Provision of plant at ground floor and roof level (including provision for PV panels). The proposed development is an amendment to Apartment Block 2 permitted under SDCC Reg. Ref. SDZ19A/0004, as amended by SDCC Reg. Ref. SDZ21A/0016. The overall number of residential units under SDCC Reg. Ref. SDZ19A/0004, as amended increases from 237 no. to 242 no. dwellings as a result of this development. The lands are bounded generally to the northwest by the Hillcrest residential development, to the northeast by Supervalu Lucan, to the south by permitted public open space and Somerton View and north by the completed Apartment Block 1.	GRANT PERMISSION
SD24A/0290W	Killross Properties Limited	Killross Properties Limited, intend to apply for permission for a residential development of 97 dwellings (consisting of 45 no. houses, 48 no. apartments and 4 no. duplexes), the demolition of 7 no. structures including 3 no. habitable dwellings, a 293.1 sq.m creche facility and all ancillary development, on a 2.17 ha site to the north of the N4 Lucan by-pass and to the east of Ardeevin Manor and Ardeevin Court, (Lucan and Pettycanon townlands), Lucan, County Dublin. Vehicular access is proposed from Ardeevin Avenue, Ardeevin Manor to the west, and cyclist and pedestrian access is proposed from Primrose Lane to the north. The proposed development comprises: 1. The Demolition of 7 no. existing structures on site including storage units, a community building and 3 no. habitable dwellings (999.92 sq.m)2. The Construction of 97 no. residential dwelling comprising: 2 no. 1 bedroom apartments; 46 no. 2 bedroom apartments; 2 no. 2 bedroom duplex units; o 2 no. 3 bedroom duplex units; o 44 no. 4 bedroom semi-detached houses; and o 1 no. 4 Bedroom Detached House. 3. The Construction of a 293.1 sq.m childcare facility; 4. 4,039 sq.m of Public Open Space provided in 7 separate landscaped areas.5. The extension of Ardeevin Avenue facilitate vehicular access to the site. 6. Connection to Primrose Lane to facilitate cyclist and	GRANT PERMISSION

		pedestrian access. 7. 101 no. car parking spaces, 125 no. bicycle spaces; 8. All enabling and ancillary development and works including landscaping, boundary treatments, lighting, water and utility services and connections, waste management and all ancillary development and works above and below ground.	
SD25A/0228W	The Department Of Education & Youth	The Development will consist of the installation of sustainable energy compounds to host 1 no. LPG tank and 5 no. modular heat pumps, and all associated site development works.	GRANT PERMISSION
SD22A/0297	Board of Management Scoil Aine Naofa	Construction of 2 single storey prefabricated buildings incorporating 4 temporary classrooms with ensuite toilet facilities and all associated site and drainage works; Installation of a 12 panel photovoltaic array to the roof of existing school building; retention for the existing single storey prefabricated buildings previously granted under SD17A/0276 and SD13A/0056.	GRANT PERMISSION & GRANT RETENTION
SD21A/0161	ERF Lucan Investment DAC	Two-storey commercial building providing two new units and ancillary accommodation (1,574sq.m gross floor area); Unit 1 will be used as a shop (1,057sq.m), Unit 2 will be used for professional services or health centre or office or gymnasium (517sq.m); the development will also consist of roof plant and PV panels; Lucan advertising signage (50sq.m) and other indicative illuminated signage zones; extended service yard and new access gates; new pedestrian linkage to adjoining Somerton site; reconfigured customer car park and new vehicle charging infrastructure; standalone substation/switch room (30sq.m); hard and soft landscaping, and pedestrian canopy; connection to services; all associated site and development works.	GRANT PERMISSION
SD23A/0292	Esker Lawn Cemetery Limited	The construction of a new 485 m2 crematorium within the grounds of Esker The construction of a new 485 m2 crematorium within the grounds of Esker Lawn Cemetery consisting of a congregation space, 1 no. electric cremator and associated plant and services spaces, and the provision of visitor toilets, and ESB substation; provision of new car parking area and minor adjustments to existing parking resulting in the net addition of 2 parking spaces; amendments to existing site landscaping involving removal and reduction of existing hard surfaces and roadway surfaces and all associated works; the construction of new landscaping works including a contemplation pond, water feature, planted landscape berms and swale drains at the building perimeter and at the adjacent area designated for grave spaces under SD10A/0331 as part of a combined suds drainage and biodiverse planting strategy; temporary access for construction traffic to be provided from the eastern boundary, and the existing boundary treatment reinstated post construction.	GRANT PERMISSION

SD22A/0390	Nacul Developments Ltd	Demolition of an existing two storey detached dwelling (162sq.m) and associated out-buildings on site and the construction of 7 two storey (plus dormer level); 5 bedroom houses comprised of 3 detached houses and 4 semi-detached houses on a site area of c. 0.3ha; all associated site development works, car parking, open spaces and landscaping etc; proposed access to the development will be via the existing vehicular entrance on the Lucan-Newlands Road / Esker Hill.	GRANT PERMISSION
SD20A/0142	Frances Dowling	Demolition of an existing house, Hillhouse, Lucan Road and ancillary outbuildings and the construction of one 4 storey building accommodating 20 apartments comprised of 5 one bedroom apartments and 15 two bedroom apartments. Vehicular access to the proposed development will be via Lucan Road and Lucan Heights with 13 car parking spaces and 12 bicycle parking spaces and ancillary services including a detached water storage tank and bin store housing all on a site of 0.1925ha.	GRANT PERMISSION
SD25A/0203W	Fitzgibbon Brothers Ltd	Construction of a part 3 to part 5 storey building comprising 20 no. apartments (7 no. 1 bed apartments, 12 no. 2 bed apartments and 1 no. 3 bed apartment); Balconies and/or private terraces are provided for all apartments on north, south and west elevations; The development includes 46 no. bicycle parking spaces, including 34 no. long stay and 12 no. short stay spaces. Secure cycle parking spaces are provided at ground floor level of the building to serve the residential units. Short term/visitor cycle parking spaces to serve the residential units are located at surface level; Alterations to the existing car parking to provide a total of 21 no. car parking spaces for the apartment units, comprising 17 no. spaces allocated to the west and realignment of 4 no. existing spaces to the south, including 1 no. accessible parking space; Provision of communal open space at ground floor level; and the proposed development includes foul and surface water drainage, communal open space, landscaping, bin store, boundary treatment, site lighting, green roofs, PV panels at roof level and all associated site works.	GRANT PERMISSION
SD21A/0323	New Ireland Assurance Company PLC	Construction of single storey drive through coffee shop pavilion within the existing carpark of Lucan Retail Park; building total floor area of 170.45sq.m and would operate for the sale and consumption, on and off the premises of food and beverages; development will include the reconfiguration of section of existing carpark; removal of 45 car parking spaces to make way for proposed building; vehicle circulation route and collection point; existing carpark to be reduced from 285 to 240 car spaces; all ancillary site works including drainage, external seating, cycle parking, signage location and landscaping.	GRANT PERMISSION
SD22A/0372	John Shenton & Margaret Hanlon	Demolition of existing two storey detached dwelling house and outbuildings; Construct new purpose built three storey mixed used building with, a new	GRANT PERMISSION

		physiotherapy practice, consisting of 5 consultation rooms, office space, staff areas as well as a rehab gym and studio area, all over two floors at ground and first floor levels; One bedroom apartment with own door access and dedicated private balcony area at the second floor level; 5 car parking spaces and secure bicycle parking for 6 bicycles all on site; Back lit signage to the front facade of the building; All associated site development works.	
SD20A/0329	Leixlip Union of Parishes	A Columbarium for the interment of ashes consists of 5 Columbaria of 15 double niche or equivalent single niche per side within a landscaped enclosure with fixed cross to east chancel at the southeast corner, of the curtilage of the property. The site is accessed from the church forecourt to the east and will include a free standing stone screen wall 1.8m high and from an existing inner courtyard to include a memorial threshold. Site clearance will include demolition of a stone built shed and the felling of 2 trees.	GRANT PERMISSION
SD22A/0072	Tesco Limited Ireland	(i) Retention permission for 'Click and Collect' signage in the existing Tesco car park; and (ii) permission for the construction of a sheltered canopy (c50 sq.m) in the existing car park for the purpose of providing 2 dedicated 'Click and Collect' spaces for the existing Tesco store and all associated site development works.	GRANT PERMISSION & GRANT RETENTION
SD21A/0129	The Board of Management	Two storey extension (floor area 199sq.m) containing 1 classroom at ground floor level; 1 classroom and an assisted shower room at first floor level to the rear of existing two storey school building (floor area 2,767sq.m); new roof window to existing roof surface of adjacent stairwell, together with all associated site works.	GRANT PERMISSION
SD24A/0198	Canon Despard Centre	Permission for the removal of existing prefabricated structure on site with replacement permanent detached two storey/dormer structure located to the north-east of the site for mixed flexible community uses (such as childcare/creche/playschool/community uses) and all associated site works. The development is within the curtilage of a site that includes protected structure 025, James Mc Carten memorial slab 1807 and within a natural heritage area adjoining the Liffey valley.	GRANT PERMISSION
SD22A/0384	Eir (Eircom Limited)	The construction of multi-operator telecommunications infrastructure comprised of a 21m monopole (overall structure height of 22 metres), antennas, dishes and associated equipment, together with new ground level equipment cabinets, new fencing, landscaping and all associated site works.	GRANT PERMISSION
SD23A/0146	Vantage Towers Ltd	Erect a 21 metre high multi user monopole with antennas, dishes and associated telecommunications equipment, all enclosed in security fencing.	GRANT PERMISSION
SD24A/0137W	DAA PLC	The installation of an aircraft noise monitoring terminal on a standalone, tiltable	GRANT

		mast structure (6m in height) along with associated works including electrical connection on land within the car park.	PERMISSION
SD23A/0110	Michael Russell	Construction of a new two storey dwelling in the side of existing dwelling including two car park spaces at the front of new dwelling and all ancillary site works.	GRANT PERMISSION
SD21A/0275	Eleanor Minihan & Maureen McGlynn	Construction of new single storey 2 bedroom, detached house in garden of existing house; relocation of the entrance gate to the existing house; construction of new entrance gate and driveway to serve the new dwelling; all associated site and drainage works.	GRANT PERMISSION
SD22A/0320	Eoin & Nora Hickey	Two storey three bed Ancillary Dwelling Unit (ADU) with mezzanine loft, solar panels, porch, veranda deck, terrace and associated site works, utilities, landscaping, facilities and services, on site of and adjacent to existing single storey family bungalow (retained); The ADU will share existing entrance gateway and is accessed via a private new avenue to private courtyard with parking for two cars.	GRANT PERMISSION
SD20A/0339	Alan Byrne	Two storey, three bedroom end of terrace house to side of existing house including alterations to existing boundaries for creation of a new vehicular access gate; adjustments to existing vehicular access gate and associated site works.	GRANT PERMISSION
SD23A/0008	Olive Mulligan & Paul Kelly	Construction of a new two storey dwelling house, vehicular entrance onto Westbrook park on a site located at 11 Meadowview Grove and 73 Westbrook Park and all associated site works.	GRANT PERMISSION
SD22A/0066	John Pope	The demolition of the existing 3-bedroom, single storey detached house and sheds and the construction of three houses; two 3 bedroom 3 storey; semi-detached houses extending to 131.50sq.m each and one 3-bedroom; 3 storey detached house extending to 131.5sq.m; and all associated site works. Each house will have 2 off-street parking spaces to the front of the house (the total number of car spaces will be 6).	GRANT PERMISSION
SD22A/0343	Rita Nolan	Extension to existing house and construction of a new three bedroom detached house on the site with a share site entrance and separate driveways and parking.	GRANT PERMISSION
SD24A/0175W	Sean Hoban	Planning permission for a 3 bedroom detached house, demolition of existing garage, extension to rear of existing house and all associated site development works.	GRANT PERMISSION
SD25A/0015	Michael & Eileen Shannon	Creation of new vehicular entrance to accommodate 1 car park space, Construct new 2 bed single storey dwelling. Construct new 1.8M high retaining wall to replace existing retaining wall and form pedestrian gate entrance on Ardeevin Court side of new wall. Construct new 1.8M high boundary wall between No 31	GRANT PERMISSION

		and proposed site, reducing to 1.2M high. Provision of 42sqm open space to rear and 104 sqm to front. Connecting to existing sewer and watermain. All associated works including landscaping.	
SD24A/0204	Philomena Condron	Construction of a proposed new three bedroom dormer bungalow with new vehicular entrance, boundary treatments and associated site works.	GRANT PERMISSION
SD25A/0080W	Mohammad and Reema Jameel	The development will consist of demolition of existing garage and utility room and provision of a two storey three-bedroom end of terrace house. Proposed finishes to match and align with existing semidetached house inclusive of all associated site works on adjoining site.	GRANT PERMISSION
SD22A/0390	Nacul Developments Ltd	Demolition of an existing two storey detached dwelling (162sq.m) and associated out-buildings on site and the construction of 7 two storey (plus dormer level); 5 bedroom houses comprised of 3 detached houses and 4 semi-detached houses on a site area of c. 0.3ha; all associated site development works, car parking, open spaces and landscaping etc; proposed access to the development will be via the existing vehicular entrance on the Lucan-Newlands Road / Esker Hill.	GRANT PERMISSION
SD20A/0210	Jennifer McDonnell	2.5 storey, 3 bedroom detached house with bedroom in attic space to side of garden with use of existing family entrance and driveway to access the house and all associated site development works.	GRANT PERMISSION
SD22A/0293	Iosif and Lucia Gabor	The Development will consist of the demolition of existing garage and the erection of one and a half story dwelling to the side of the existing Dwelling and all associated site works	GRANT PERMISSION
SD22A/0396	Phoenix Limited Croft	Replacement of previously approved detached three storey 5-bedroom dwelling (295 sq.m) with 2 semi-detached three storey 4-bedroom dwellings (150 sq.m each); The house being replaced was previously granted planning permission by An Bord Pleanála under ABP-304659-19 (SDCC Ref. SD18A/0310); The application also seeks the modifications to the car parking and associated site works to facilitate the revised house types.	GRANT PERMISSION

13.2 Population and Human health

Several developments are proposed or under construction in the area of the proposed development. If the construction periods of these developments are to overlap, there is a potential to impact on population and human health through disruptions in Lucan and to residential and community facilities along the Lucan Road (R835). These effects will be Temporary while the construction phase progresses and will not be significant.

Once operational, the proposed mental health facility, when considered cumulatively with the above developments, will have a Positive impact on population and human health.

13.3 Biodiversity

Of the local permitted (and pending) plans and projects, and those for which an application has been made but not yet determined, 4 projects are presented as the most likely to act in a cumulative manner given the presence of overlapping Zols with the site. These 4 development projects are listed below:

- SD24A/0051;
- SD24A/0241W;
- SD22A/0372; and
- SD24B/542W.

Each of these projects overlaps with one or more of the Zol buffers, i.e. surface water, disturbance and dust, associated with the proposed development. Therefore, there is a potential for cumulative and/or in-combination impacts to arise with the construction and operation of the development site. Potential impacts that may arise as a result of relationships between sensitive receptors within and outside the site have been addressed in this EIAR and AA Screening. Guidance for the assessment of indirect and cumulative impacts, as well as impact interactions has been taken from the European Commission document 'Guidelines for the Assessment of Indirect and Cumulative Impacts' as well as 'Impact Interactions' (Walker and Johnston 1999) and 'Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland' (CIEEM 2016 and 2006).

The list of projects above has been consulted. With the implementation of mitigation measures outlined in this chapter, no significant cumulative impacts are considered likely with regard to SPAs and SACs within the Zol however, there is potential for cumulative impacts on the Liffey Valley pNHA.

13.4 Land and Soils

The list of projects in Table 13.1 which have been granted planning permission within a 2km radius of the proposed development has been consulted; no significant adverse impacts on Land and Soils are expected

13.5 Water

Cumulative effects are the result of several minor effects combining to create a more significant effect. The assessment of cumulative effects considers existing stresses on the water environment (i.e., surface water runoff, urban wastewater drainage, from existing developments in the surrounding area) as well as developments close to this development that are in planning or are underway which are outlined in Table 13.1. Small extensions or alterations to existing dwellings were not considered for the purposes of assessing potential cumulative effects here, as they will not have an effect on hydrology or hydrogeology

13.6 Air and Climate

In relation to the cumulative impact of the proposed development, with other proposed developments planned in the area, the list of developments noted from in Table 13.1 have been reviewed.

The construction phase of the proposed development, in combination with the construction phases of projects in the surrounding area could have the potential to negatively impact on air quality in the area due to cumulative construction phase air quality emissions.

If applicable, hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/ deliveries which might be using the same strategic road network routes.

All proposed developments which could be considered as medium/high risk sites, are in excess of 500 metres away from the proposed development. Therefore, no projects in the area are predicted to result in cumulative impact in terms of air quality.

13.7 Noise and Vibration

In relation to the cumulative impact of the proposed development, with other proposed developments planned in the area, the list of developments noted from in Table 13.1 have been reviewed.

The construction phase of the proposed development, in combination with the construction phases of projects in the surrounding area could have the potential to negatively impact on noise levels in the area due to cumulative construction phase impact.

All proposed developments which could be considered to have the potential to result in a significant cumulative noise impact, are in excess of 500 metres away from the proposed development. Therefore, no projects in the area are predicted to result in cumulative impact in terms of noise

13.8 Material Assets

There are several other recent developments and planning applications in the vicinity of the proposed project. Larger development planning applications in the near vicinity from the last three years are included. Applications for home extensions, internal alterations and retention are not considered. The developments are; Saint Joseph's College, Post Primary School and Soil Mhuire Girls National School, Lucan Road, Lucan, Co. Dublin and Clonbrone, Lucan Newlands Road, Esker Hill, Lucan, Co. Dublin.

13.9 Cultural heritage

The potential for cumulative effects has been considered with reference to existing and permitted developments in the vicinity of the site, including proposals along the Lucan Road corridor and within the wider institutional landscape.

The proposed development is physically contained within the existing St. Edmundsbury campus, and does not give rise to direct impacts on off-site protected structures or recorded monuments.

No significant cumulative impacts on cultural heritage have been identified arising from the combination of this development with other known or permitted developments, or incremental change to the wider historic landscape.

13.10 Landscape and Visual

The cumulative assessment considers the potential for additional landscape and visual effects to arise from the proposed development in combination with other existing, permitted or under-construction developments in the surrounding area. The cumulative study area has been defined as a 0.5 km radius from the proposed development boundary, which is proportionate to the height and extent of the proposed buildings and the enclosed character of the Liffey Valley landscape in this location.

A desktop review of planning records and site observations identified a number of small-scale residential, commercial and industrial developments within the wider area. Most of these comprise minor extensions, lighting proposals or alterations at individual property scale and are not of a nature or scale likely to give rise to notable cumulative effects when considered with the proposed development.

Two permitted developments within or close to the 0.5 km radius have been identified as having the greatest potential to contribute to cumulative effects:

- SD16A/0072/EP – demolition of existing single and two-storey post-primary school buildings and construction of a part two, part three-storey post-primary school extension at

Saint Joseph's College and Scoil Mhuire Girls National School on Lucan Road. At the time of survey, works were ongoing and a crane was present on site.

- SD18A/0429 – demolition of a one-storey warehouse building at Millbank Business Park and construction of nine three-storey residential houses.

Both of these schemes are modest in scale relative to the wider Liffey Valley Landscape Character Area and are located within or immediately adjacent to the existing built fabric along the Lucan Road / Chapel Hill corridor and the Millbank area to the west of the River Liffey.

13.10.1 Cumulative Landscape Effect Assessment

Individually, the permitted school extension and the small residential scheme at Millbank represent incremental intensification within areas that are already characterised by built development. They do not alter the underlying pattern of the Liffey Valley Landscape Character Area, which comprises a mosaic of riparian woodland, agricultural land and historic and modern urban areas.

The proposed development will consolidate healthcare and related uses within the established St Edmundsbury estate, largely contained within the existing woodland framework and former walled garden and read as part of the existing cluster of institutional and residential development along the Lucan Road. In combination with the other identified schemes, it will contribute to a modest increase in the extent of built form within the urban edge of the Liffey Valley but will not diminish the dominance of riparian woodland, topography and open space as the defining landscape characteristics of the valley.

Given the medium to high sensitivity of the Liffey Valley Landscape Character Area and the limited geographic extent and scale of change introduced by the identified cumulative schemes, the cumulative magnitude of change to landscape character is assessed as low. This results in a slight, not significant cumulative effect on the wider Liffey Valley Landscape Character Area and on the local estate landscape of St Edmundsbury. The key woodland corridors, estate structures and open space pattern are retained and reinforced through the proposed landscape framework and therefore no significant adverse cumulative landscape effects are predicted.

13.10.2 Cumulative Visual Effect Assessment

Cumulative visual effects may arise where the proposed development is experienced in combination with the other identified schemes from the same viewpoint ("combined visibility") or where these developments are seen in succession along a route or across an area ("sequential effects").

Combined visibility is most likely to occur for receptors along the Lucan Road and Chapel Hill where there is existing intervisibility with both the St Edmundsbury estate and the school complex to the south-west, and for a limited number of receptors in the Millbank area west of the River Liffey. However, views are heavily filtered and contained by existing and proposed tree cover, local topography and intervening built form. In these views the proposed development will be read as part of the existing pattern of institutional and residential buildings along the road corridor, with the school extension and Millbank housing largely perceived as separate, small-scale elements within the wider urban backdrop. The cumulative magnitude of visual change at these receptors is therefore low or negligible, resulting in cumulative effects that are slight or imperceptible and not significant.

Sequential effects may occur for people travelling along Lucan Road, Chapel Hill and the local walking routes that connect through the Liffey Valley woodland and agricultural lands. Along these routes, views of the proposed development will be experienced intermittently, in combination with glimpses of existing residential areas, schools and commercial development. The permitted school extension and Millbank residential scheme will appear as small additional built elements within this sequence. The proposed development will be experienced mainly at the point where the Lucan Road passes the main St Edmundsbury entrance and from short sections of Chapel Hill, with tree cover and walls providing partial screening and filtering of views. As distance from the site increases the proposed development will appear smaller within the experienced view and the magnitude of change to the view is therefore further reduced. Overall, sequential cumulative effects are assessed as slight or imperceptible and not significant for road users and recreational walkers.

No additional developments of a scale or proximity likely to give rise to significant cumulative landscape or visual effects have been identified within the defined study area. On this basis, no

significant cumulative effects on landscape character or visual amenity are predicted as a result of the proposed development in combination with other known projects.

13.11 Risk of Major Accident and/ or Disaster

The EIA Directive requires that the EIAR considers the effects on the environment in the event of major accidents and/or disasters relevant to the project, including those caused by climate change.

It is considered that the two areas of potential for accidents and/or disasters (none major) relevant to the project are:

- Fire; and
- Risk of spillage.

Proximity to Seveso sites was also considered but ruled out due to the distance from the nearest Seveso site (6.64km) to the proposed development.

13.11.1 Fire

In the event of a fire, the proximity (less than 10m) of the proposed development to the pNHA woodland would be of concern to the protected habitats therein.

13.11.2 Risk of spillage

The site is located over a locally important Aquifer, ground water is extremely vulnerable (see Figure 6-3).

During construction, there is a risk of localised accidental pollution incidences from the following sources:

- Spillages or leakage of temporary oils and fuels stored on site;
- Spillages or leakage of oils and fuels from construction machinery or site vehicles;
- Spillage of oil or fuel from refuelling machinery on site;
- Run-off from concrete and cement during the use of cement-based products.

With the implementation of mitigation measures outlined in section 6.5, the proposed development will have no negative effects on WFD surface waterbodies during construction. The status of surface waterbodies in the area (Liffey_170 and Liffey_180) will not be deteriorated due to the construction activities.

13.11.3 Proximity to Seveso sites

There are five Seveso (COMAH) sites in South Dublin. The nearest Seveso site is 6.64km from the proposed development. The site is the BOC Gases Ltd. Ireland, PO Box 201, Bluebell Industrial Estate, Dublin 12. There are no likely significant impacts on the environment of the site due to proximity to a Seveso site.

14 Schedule of Mitigation

14.1 Introduction

Table 14-1: Mitigation by chapter

Phase	Mitigation
Chapter 3: Population and Human Health	
Construction	1. A comprehensive Health and Safety Programme will be put in place on the site prior to commencement of construction to minimise any risks to site personnel and visitors. 2. The requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013) will be complied with at all times. 3. A Construction Stage Traffic Management Plan will be developed and agreed with South Dublin County Council prior to undertaking any construction works. 4. Sewer laying to be in accordance with the 'Greater Dublin Regional Code of Practice for Drainage Works' version 6.0. These procedures will guarantee that residents affected by relocation of utilities will be given ample notice before construction starts. 5. A Construction Waste Management Plan will be produced by the appointed contractor to mitigate impacts on the surrounding roads.
Operational	6. The operation of the proposed development will be carried out in strict accordance with all Irish and European regulations governing safety in the workplace and in particular the regulations implemented under the Safety, Health and Welfare at Work Act, 2005 and its subsequent amendments. 7. All relevant facility employees will be fully trained in the operating procedures for equipment and processes, with particular emphasis on related health and safety issues.
Chapter 4: Biodiversity	
Construction	8. Prior to the commencement of any site works, a Construction and Environment Management Plan (CEMP) will be submitted to South Dublin County Council for agreement. 9. The contractor will be required to use experienced operators for the work; provide an appropriate level of continuous monitoring during any concrete pours by experienced management; and have method statements approved by the client prior to commencing works. Works will be carried out using recommendations from current guidance and relevant codes of practise as outlined in EA (2011) - <i>Managing concrete wash waters on construction sites: good practice and temporary discharges to ground or to surface waters</i>. 10. With regard to construction activities, reference will be made to British Standard BS 5228-1, which offers detailed guidance on the control of noise from demolition and construction activities. 11. During the construction phase, an appointed Ecological Clerk of Works (ECow) will be present when site lighting is initially set up in the works areas and will be responsible for monitoring lux levels to ensure they are not impacting dark

corridors or foraging habitat for local crepuscular/nocturnal fauna.

12. Additional woodland survey of the proposed area of pNHA woodland to be relocated. This survey should follow the methodology outlined within the National Survey of Native Woodland 2003-2008 (Perrin et al., 2008a, Perrin et al., 2008b).

13. Updated Badger survey within the woodland habitat within the site, including the camera trapping of any existing active/inactive setts. These will ideally be conducted between October and March when vegetation cover will be a less significant obstacle to surveyors. The survey will be conducted no more than 10-12 months prior to the commencement of works.

14. Updated potential bat roost assessment, with a particular focus on trees due to be felled/damaged during the construction phase, as well as within the existing structures on site including the historic walls due for demolition/refurbishment.

15. Updated bat activity and static surveys to determine current activity levels and bat species assemblages within the site and improve on existing sub-optimal bat data, for later comparison with surveys post construction.

16. Breeding bird nest check, with a particular focus on any location where trees are being relocated, felled or trimmed back. Additionally, the breeding nest checks will also include the checks for nesting birds within the existing buildings and stonewall structures on site.

17. An updated invasive species survey to track the potential spread of invasive flora present on-site, with a particular focus on the current distribution of invasive species within the pNHA woodland habitat.

18. The works compound will be sited within the lawn area to the east of the proposed adolescent building. This is over 50m away from the River Liffey riparian zone and has ease of access from the road to the north. An area to the south of the site compound will be cordoned off and will temporarily store material excavated from the woodland doner site, which will later be used to create green roofs on the southern hospital building.

19. Only plant and materials necessary for the construction of the works will be permitted to be stored at the compound location.

20. Site establishment by the Contractor will include the following:

- Site facilities (e.g., toilets);
- Secure compound for the storage of all on-site machinery and materials;
- Temporary car parking facilities;
- Temporary fencing.

21. Site Security to restrict unauthorized entry.

22. Bunded storage of fuels and refuelling area. All tank and drum storage areas on the site will, as a minimum, be bunded 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 substances which could be stored within the bunded area.

23. Spill kits will be stored in the site compound with easy access for delivery to site in the case of an emergency. Spill kits must include suitable spill control materials to deal with the type of spillage that may occur and where it may occur. Typical contents of an on-site spill kit will include the following as a minimum:

- Absorbent granules;
- Absorbent mats/cushions;
- Absorbent booms;
- Track-mats, geotextile material and drain covers

24. All used spill materials e.g., Absorbent pads will be placed in a separate container which will be located in the Contractors compound to store absorbents used to contain spillages of hazardous materials. The container will be clearly labelled, and the contents of the container will be disposed of by a licenced waste contractor at a licenced site.
25. All used spill materials will be placed separate container which will be located in the Contractors compound to store absorbents used to contain spillages of hazardous materials. The container will be clearly labelled, and the contents of the container will be disposed of by a licenced waste contractor at a licenced site. Records will be maintained of material taken off site for disposal.
26. A maintenance programme for the bunded areas will be managed by the site environmental manager. The removal of rainwater from the bunded areas will be their responsibility. Records will be maintained of materials taken off site for disposal.
27. The site environmental manger will be responsible for maintaining all training records.
28. Potentially contaminated run off from plant and machinery maintenance areas will be managed within the site compound surface water collection system.
29. Wherever reasonably practical, refuelling of vehicles will be carried out off site at designated refuelling areas to reduce risk of accidental hydrocarbon pollution events. These areas will be rendered impervious and will be constructed to ensure no discharges will cause pollution to surface or ground waters.
30. Adoption of a surface water plan including appropriate barrier controls to prevent any polluted surface water from the site reaching the adjacent habitats of high local ecological value.
31. Minimise area of exposed ground by maintaining existing vegetation in vicinity of site compound.
32. Fail-safe site drainage and bunding through drip trays on plant and machinery will be provided to prevent discharge of chemical spillage from the sites to surface water.
33. The coordination, implementation and ongoing monitoring of dust produced by site activities. The key aspects of controlling dust are listed below:
 - The development of a documented system for managing site practices with regard to dust control;
 - Spraying of exposed earthwork activities and site haul roads during dry weather;
 - Provision of wheel wash at exit points, which will be located away from the canal;
 - Covering of stockpiles, which will be routinely inspected by the ECoW, EnvCoW and Site Environment Manager (SEM);
 - Control of vehicle speeds, speed restrictions and vehicle access; and
 - Sweeping of hard surfaced roads.
34. Erection of a 2.4m high hoarding will be provided around work areas where allowable to minimise the dispersion of dust from working areas.
35. Stockpiles will be located as far away as possible from sensitive ecological receptors and covered/dampened during dry weather.
36. Generators will be located as far away as practicable from sensitive ecological receptors.
37. To prevent the harmful emissions from vehicle exhausts, on-site and delivery vehicles will be prevented from leaving engines idling, even over short periods.

38. Where Asbestos Contaminated Material (ACM) is uncovered on site during construction, the ACM will be double-bagged and removed from site by a competent contractor and disposed of in accordance with the relevant procedures and legislation.
39. At all times, the measures used to control dust will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.
40. On-site and delivery vehicles will be prevented from leaving engines idling, even over short periods.
41. Material wastage due to poor timing or over ordering on site will be minimised to reduce the embodied carbon footprint of the site.
42. The travel distance required to complete the delivery of material and supplies shall be taken into account during procurement and minimised where possible.
43. Concrete delivery, concrete pours and related construction methodologies will be part of the procedure agreed with the contractor to mitigate any possibility of spillage or contamination of the local environment. Particular attention will be paid during the pouring process in order to avoid leakages or spills of concrete.
44. Washout of concrete plant will occur off site at a designated impermeable area with waste control facilities.
45. Raw, uncured or waste concrete will be stored appropriately prior to disposal by licenced contractor.
46. The contractor's construction methodology will require the use of precast elements where practical; the use of secondary protection shuttering for concrete pours; all pours to be carried out in dry weather conditions; and that all trucks be cleaned prior to leaving respective depots.
47. The contractor's construction methodology will require the use of precast elements where practical; the use of secondary protection shuttering for concrete pours; all pours to be carried out in dry weather conditions; and that all trucks be cleaned prior to leaving respective depots.
48. As outlined in sub-section 4.6.1, the contractor will be required to use experienced operators for the work; provide an appropriate level of continuous monitoring during any concrete pours by experienced management; and have method statements approved by the client prior to commencing works. Works will be carried out using recommendations from current guidance and relevant codes of practise as outlined in **EA (2011) - Managing concrete wash waters on construction sites: good practice and temporary discharges to ground or to surface waters**.
49. Regular inspections and maintenance of plant and machinery checking for leaks, damage or vandalism will be made on all plant and equipment.
50. In the event of a spill the Contractor will ensure that the following procedure are in place.
51. Emergency response awareness training for all Project personnel on-site works.
52. Appropriate and sufficient spill control materials will be installed at strategic locations within the site. Spills kits for immediate use will be kept in the cab of mobile equipment.
53. All potentially polluting substances such as oils and chemicals used during construction will be stored in containers clearly labelled and stored with suitable precautionary measures such as bunding within the site compound.
54. The site compound fuel storage areas and cleaning areas will be rendered

impervious and will be constructed to ensure no discharges will cause pollution to surface or ground waters.

55. Designated locations for refuelling are within Site Compound.

56. Potentially contaminated run off from plant and machinery maintenance areas will be managed within the site compound surface water collection system.

57. Damaged or leaking containers will be removed from use and replaced immediately.

58. During the construction phase, in order to protect the drainage ditch and subsequent downstream aquatic habitats within the River Liffey, heras fencing will be erected at the start of the construction phase along the northern road immediately adjacent to the ditch. Additionally, a surface water dam will be installed at the ditches most southernly point within the site boundary, in proximity to the northern road. The dam will be constructed using silt screens staked the ground and underlain with fine gravel. This dam will act as a filter to surface water pollutants and excess sediment run-off during the construction phase. The dam will be checked daily by the onsite ECoW for slicks.

59. Erection of barriers at construction works boundary as necessary and around items such as generators or high duty compressors.

60. Limiting the hours during which site activities likely to create high levels of noise are permitted. Construction activities will take place Monday to Friday, between 07:00 and 18:00, and on Saturdays, between 08:00 and 13:00.

61. A site representative responsible for matters relating to noise will be appointed to liaise with South Dublin County Council.

62. Limit the hours of working to daylight hours, to limit disturbance to nocturnal and crepuscular animals.

63. Due to the potential presence of Otter; Badger; Irish Hare; Common Frog; and bat species, the use of lighting at night should be avoided. If the use of lighting is essential, then a directional cowl should be fitted to all lights to prevent light spill and to be directed away from all treelines / wooded areas.

64. Contractors must ensure that no harm comes to wildlife by maintaining the site efficiently and clearing away materials which are not in use, such as wire or bags in which animals can become entangled.

65. Any pipes should be capped when not in use (especially at night) to prevent local fauna becoming trapped. Any excavations should be covered overnight to prevent animals from falling and getting trapped. If that is not possible, a strategically placed plank should be placed to allow animals to escape.

66. Site lighting required during construction phase will be installed in a manner that it is positioned, directed and cowed away from any dark corridors (e.g. pNHA woodland), therefore avoiding any unnecessary light spill and disturbance to bat activities.

67. The intensity of lighting will be kept to the minimum level required for safety and security

68. Low-UV LEDs or low / high pressure sodium lamps will be the preferred bulb type, as they have least adverse effect on bats. Mercury, metal halide or high-UV LED bulbs will not be used.

69. The site lux levels at suitable foraging and commuting habitats for local bat species will not be increased above 1lux in important dark corridors as a result of construction activities within the proposed development's work area.

70. Wherever reasonably possible, works will be carried out in daylight hours in order to reduce the need for lighting on site (outside of compound areas). No lighting will be in operation outside of working times.

71. The appointed ECoW will be present when site lighting is initially set up in a

works area and will regularly monitor the lux levels to ensure that they are not impacting dark corridors or secondary foraging locations.

72. In order to avoid the damage and compaction of roots and vegetation, storage and movement of machinery should be avoided in rooting zones adjacent to the trees, and fences should be in place in the areas of the of trees and hedges that are not scheduled for excavation and construction works.

73. Any invasive species identified on site to be fenced off, clearly marked and avoided before commencement of works, which will be monitored by the ECoW prior to any works.

74. If not possible to avoid infested areas, invasive species are to be dealt with in accordance with NRA guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads.

75. Good construction site hygiene to be employed in all works areas. All personal and visitors to disinfect boots before entering or leaving site. Vehicles entering or leaving site to be thoroughly washed in appropriately spaced wash areas. Run-off from vehicle wheel wash areas to be appropriately managed without discharge to adjacent watercourses.

76. Any imported material to be formally documented as invasive free and confirmed by ECoW before acceptance on site.

77. Any potentially contaminated material arising from site must either be treated on site or re-used within the site boundaries to mitigate the risk of spread.

78. Following completion of works, a monitoring program will be established to ensure no additional spread of invasive species has occurred and that ongoing treatment of invasive species has been effective.

79. Woodland surveys will be conducted annually for the duration of the construction phase and will be conducted in addition to the presence of an on-site ECoW and the monitoring of the translocated woodland.

80. Surveys will be conducted annually to assess the health of the existing Hairy St John's-wort population within the woodland area, as well as assess the potential spread of this species. The CEMP will be updated with the results of these surveys, and any significant changes to the population of this species compared to the baseline population established pre-construction will be communicated to the on-site ECoW and the SDCC Biodiversity Officer.

81. Surveys will be conducted annually for the duration of the construction phase to assess the health of the local Badger population. The CEMP will be updated with the results of these surveys, and any significant changes to the population of this species compared to the baseline population established pre-construction will be communicated to the on-site ECoW and the SDCC Biodiversity Officer.

82. Monitoring of bats will be conducted yearly for the duration of the construction phase with measurements of light levels on site taken. This will be completed during the summer seasons as per best practice (Marnell et al 2022 & Reason, P.F. and Wray, S. (2025)). The features to monitor include ensuring commuting routes are still being used, specified lighting levels are followed, that the increased level of human activity adjacent to the woodland is not displacing bats.

83. Monitoring of birds will be conducted yearly for the duration of the construction phase taking place during the bird nesting period (March to August inclusive) as per best practise guidance. Monitoring will identify any new nests within the proposed site, as well as activity levels within previously identified nests. Monitoring surveys will also include the inspection of trees that will be removed/are damaged during the construction phase to ensure no new nests have been created there.

84. Invasive non-native species will be surveyed yearly for the duration of the construction phase within and around the site. The CEMP must be updated with the results of these surveys and any invasive species identified removed under

	supervision of the on-site ECoW following species specific best practise guidelines.
Operational	85. During the site's operation, no planting will be undertaken within the woodland habitat, either within or adjacent to the pNHA boundary. 86. Any potential planting measures considered for the translocated woodland area will be determined by the ecologist responsible for monitoring this area and will only be carried out with approval from NPWS and the DCC Biodiversity Officer. Any trees planted within the site will require additional checks to avoid the introduction of diseases to the area - in particular, in the event any Oak species are planted on site, they will be additionally checked for the non-native Oak Processionary Moth <i>Thaumetopoea processionea</i>. 87. Any Oak trees, either planted or pre-existing, that are found to have Oak Processionary Moth present will not be used/destroyed under supervision of the on-site ECoW. This is critical for preventing the potential spread of this species into the pNHA woodland. 88. It is recommended that actions from the All-Ireland Pollinator Plan be implemented through the operation and management of the site, specifically for the proposed meadows areas, including within the existing lawn to the east of the adolescent building alongside the southern and western borders of this building, and around the proposed pond area. Measures outlining pollinator-friendly management for businesses are detailed in the guidance document: Businesses » All-Ireland Pollinator Plan. Some of the measures outlined include: • Appropriate mowing regimes; • Creation of short and long grass meadows; • Pollinator friendly planting; • Provision of wild pollinator nesting habitat; and • Eliminating or reducing the use of pesticides. 89. Following the completion of the construction of the southern hospital buildings, the excavated material from the translocated woodland donor site will be used to create green roofs. The management of the green roofs will follow the same measures outlined above for the other managed grassland areas within the site, including the addition of key species, namely Yellow Rattle <i>Rhinanthus minor</i>, as well as appropriate management regimes, preventing/minimising the use of pesticides, and pollinator friendly planting. 90. Due to the loss of an area of the pNHA woodland during the construction phase, and subsequent ecological lag in terms of the maturation of the landscaped woodland habitat to the north of the southern hospital building, it is recommended that a Pine Marten box be installed on site to encourage this species to keep utilizing the site during the operational phase. The Pine Marten box should be placed within a suitable mature Sycamore, which will avoid damaging the barks of the native and naturalised mature trees, away from any road network and high footfall areas. Den boxes can be both constructed following the construction template from the Vincent Wildlife Trust (2014) or purchased through companies such as The Nestbox Company. 91. In the interest of offsetting the loss of refuge resources for Hedgehog during the initial operational phase, it is recommended Hedgehog hibernacula are placed within the shrub habitats present on site. These can be created from a spare planter or wooden storage boxes and should ideally be placed away from any roads and hidden by groundcover to minimise disturbance. 92. In the interest of enhancing the site for local bats (i.e., pipistrelles and Leisler's Bat) a minimum of six bat boxes should be installed on-site. If possible, these bat boxes should be south-facing and at least 4m off the ground. If erecting on a building, erect as close as possible to the eaves of the building, and if possible, on

a building located adjacent or close to a treeline. If erecting on a mature tree, the placement must be free from ivy with no branches within a 1m radius around the location of the box. Appropriate locations for bat boxes within the site include mounted on a pole, facing southwards, within the pond to the northeast of the site. This box should be placed a suitable distance from the banks to prevent members of the public disturbing the box. Bat boxes can also be placed within a wooded section to the east of the proposed adolescent building. Additional bat boxes can be placed to the west of the pond area. These areas will remain dark during the site's operational phase.

93. Within the proposed development's landscape plans there is an expected ecological lag for the breeding birds that utilise the woodland, mitigating for this ecological lag can be achieved with the placement of bird boxes for the species that will be impacted (i.e., Greenfinch, Goldcrest, Linnet, Spotted Flycatcher). Greenfinch, Goldcrest, Linnet and Spotted Flycatcher are not picky with their nest boxes and multiple of the same box can be placed to provide these nesting opportunities. Bird boxes can be hung from the trees on site, facing a north-eastern direction, angled slightly forward to repel rain, and at a height of 2-3 metres off the ground to avoid potential predation. These boxes should also not be placed immediately adjacent to any lighting fixtures as direct lighting can confuse birds. The most suitable locations to the north of the site include the following locations; the west of the adolescent building, to the east of the adolescent building within a garden space, and around the landscaped pond to the east of this building. Bird boxes can also be placed within the trees to the west of the southern building, along the site's southwestern border.

94. To provide nesting opportunities for Barn Swallow and House Martin which have been recorded on site, it is recommended that nest boxes are incorporated into the design of the new buildings. There are multiple options to choose from depending on the design style of the proposed development's construction plans. These must be on outward facing walls and not part of the courtyards within the new complex, ideally with clear entrance flight paths, nearby treelines are not a necessity for placement of Swallow or House Martin boxes. Positioning for House Martins must be at least 3m off the ground and placed underneath eaves, consideration of droppings is required so positioning of ledges to keep walls and ground underneath clear is recommended.

95. The following guidance for the installation of Swift bricks will be followed:

- Swift bricks should be installed a minimum of 5m above the ground.
- Bricks should be installed in blockwork or brickwork walls, ideally placed high in gables, flank walls, and ends of terraces.
- Entrances should be obstructed by trees, ladders, creepers, or window cleaning gear.
- Install Swift bricks in areas out of constant sunlight and not directly above windows. Ideally in Ireland, this means they should be north or east facing.
- Nest bricks should be kept between 50-100cm apart.
- Bricks should be installed in a straight line, or in a pattern, under the eaves or across a vertical wall, away from windows.
- Between 2 to 4 bricks should be installed per house, and 4 to 10 per apartment block.

96. The clearance of the existing artificial structures on site, stonewall restoration works, loss of meadow and recolonising habitats, and the removal of a section of woodland will lead to a loss of nesting habitat for local terrestrial invertebrate species. While the relocation of a section of woodland and pond creation will create alternative nesting resources for terrestrial invertebrates, additional measures will be implemented to further remedy this loss, including the installation of insect refugia on the proposed green rooves on top of the southern building.

	Refugia can include log and leaf piles, as well as stone piles and old bricks with holes in them and should ideally be placed in locations that do not impede building maintenance so as to minimise future disturbance. 97. To create nesting resources for local solitary bee species, it is recommended bee bricks be installed within the proposed house and apartment block. Bee bricks contain cavities that are ideal for nesting space for solitary bees. These bricks require minimal internal maintenance. The following guidance is recommended for the installation of bee bricks (Green & Blue, 2026): • Bricks will be generally south facing, placed in warm sunny spots. • Bricks will be placed at least 3m off the ground to avoid human interference. • Bricks should be placed in the vicinity of potential food sources, such as flower beds and grassland areas 98. Monitoring of the retained pNHA woodland within the site, following methodology outlined within the National Survey of Native Woodland 2003-2008. Monitoring surveys will be conducted yearly for a period of 5 years following the completion of the construction phase. This will be conducted in addition to the ongoing monitoring of the translocated pNHA woodland. 99. To assess and ensure efficacy of mitigation and management measures with regards to Badgers, the woodland habitat within the site will be monitored (re-surveyed) annually for the first 5 years to ensure Badger populations are still extant and active. 100. Monitoring of bats will be conducted during the operational phase with measurements of light spill into the pNHA woodland and created pond and grassland area recorded. This will be completed over five consecutive summer seasons post construction works, as per best practice. 101. Monitoring of bird will be conducted during the operational phase, completed over five consecutive summer seasons post construction works, with a particular focus on the uptake of the artificial nesting features, namely bird boxes and bricks. 102. Following the completion of the construction phase, invasive non-native species will be monitored for the duration of the site's operational phase, with a particular emphasis on the pNHA woodland between the two Hospital buildings. The invasive species management plan will outline the long-term management and monitoring of all invasive species, with a particular focus on widespread species such as Cherry Laurel and Butterfly-bush which have the potential to reduce the effectiveness of the woodland relocation.
Chapter 5: Land and Soil	
Construction	103. A site-specific Construction and Environment Management Plan (CEMP) will be developed by the appointed contractor. This will outline the measures that will be implemented during construction to mitigate potential effects on the geology and hydrogeology of the site. 104. Surface water discharge from the site will be monitored on a weekly basis. At a minimum the monitoring will test the following characteristics: • pH; • Suspended Solids; • COD; • Total organic carbon;

	• Conductivity 105. Dust monitoring will be carried out as discussed in Chapter 8 - Air and Climate. Visual inspection of the site to ensure best practices and mitigation measures outlined above are being implemented and followed will take place at regular intervals.
Operational	106. Groundwater levels should be monitored for a minimum of 1 year following the completion of construction of the proposed development. This will determine if the development has any effect on hydrogeology. If effects are identified, further surveying will be carried out by the applicant and remedial measures will be devised depending on the nature and extent of the effect.
Chapter 6: Water	
Construction	Surface Water Runoff: 107. Surface water generated on site from rainfall will be discharged initially to settlement tanks. Prior to discharge off-site, the surface water will pass through a treatment train consisting of silt traps and settlement tanks to remove suspended solids and hydrocarbons. Regular visual inspection of the discharged surface water and monitoring of the treatment train will be undertaken. 108. Temporary storage of soil will be carefully managed to prevent any potential negative effects on the receiving hydrological environment. the material will be stored away from any existing drains within the site. Movement of material will be minimised to reduce degradation of soil structure and generation of dust. Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise potential for water ingress into excavations. 109. Weather conditions will be monitored when planning construction activities, to minimise risk of run-off from the site and the suitable distance of topsoil piles from drainage ditches/sewerage systems will be maintained. In the event of an extended period of dry weather, stockpiles will be dampened using a water spray. The level of spraying will be sufficient to just dampen the soil to avoid dust blow and avoid excessive runoff that could arise during this process. Site roads will also be subject to similar mitigation to avoid dust blow. Chemical Pollution: 110. The contractor will construct a site compound at a location at least 10m remote from any water bodies or drains. The compound may be moved or altered dependent on construction needs over the course of the project. 111. Any lubricants or hydraulic oils will be stored in bunded containers in designated bunded areas. Deliveries of fuel and chemicals will be supervised. 112. Spill protection equipment such as absorbent mats, socks and sand will be available to be used in the event of an accidental release. These will be disposed of correctly if used and replaced with new ones immediately. Disposal records for used adsorbent will be retained by the Site Manager. 113. All materials taken on-site will be clearly labelled and stored in sealable containers. 114. The diesel fuel tank will be adequately bunded (110%) and the filling nozzle will be stored within the bunded area. The Site Manager will as part of their daily site walkaround check the integrity of the fuel tank(s). The condition of the tanks will be recorded by the Site Manager. 115. Re-fuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in a designated area which will be away from any existing surface water drains which could also provide pathways to the

	underlying geology. 116. The contractor will ensure that no hazardous or noxious materials enter a watercourse or drain. Should this situation arise emergency procedures will be activated. 117. During all works the weather forecast will be monitored and a contingency plan developed to prevent damage or pollution during extreme weather. Machinery and equipment will not be left on-site during such events and will be removed beforehand. 118. Concrete washout will not be allowed within 10 metres of an existing surface water drainage point. Washouts are only allowed to take place into containment in designated areas with an impervious surface. 119. The Contractor is to clean equipment prior to delivery to the site. The Contractor is to avoid using any equipment which leaks fuel, hydraulic oil or lubricant. The Contractor is to maintain equipment to ensure efficiency and to minimise emission. 120. Precast elements will be maximised to avoid wet concreting in close proximity to water. Silt Suspended Solids: 121. The contractor will construct a site compound at a location remote from any drains. 122. All soil stockpiles will be covered (vegetated or with tarpaulins/similar material) to minimise the risk of rain runoff / wind erosion. Vegetation will be established as soon as possible on all exposed soils. 123. During extended dry periods, soil stockpiles will be dampened periodically to minimise the risk of airborne particles entering watercourses. 124. Any temporary storage of spoil, hardcore, crushed concrete or similar material will be stored as far as possible from any surface water drains and stored in receptacles where possible. To minimise the risk of contamination, the stockpiled material will be removed off-site as soon as possible. 125. Surface water drain gratings in areas near or close to where stockpiles are located will be covered by appropriate durable polyurethane covers or similar. 126. Should mobilisation of soil particles/pollution be noted in the course of weekly monitoring by the Site Manager, works will stop temporarily, and the Site Manager will initiate the interception and treatment of pollution/silt run-off. 127. Silt fencing and silt bags shall be put in place downstream of exposed soils or soil stockpiles to contain surface water runoff from the site. Changes to Runoff and Flow Pathways: 128. The contractor will construct a site compound at a location remote from any drains or open excavations. 129. Vegetation will be established as soon as possible on all exposed soils.
Operational	130. The proposed development has been designed in accordance with the Greater Dublin Strategic Drainage Strategy guidelines (GDSDS) and will incorporate SuDS features, which will help to mitigate against additional surface water runoff, as per the Flood Risk Assessment for the proposed development, as well as silt traps and hydrocarbon interceptors. 131. During the operational phase, regular visual inspection of the silt traps and hydrocarbon interceptors should be carried out to ensure they are operating correctly. No additional mitigation measures are required.

Chapter 7: Air and Climate

Construction	Communication: 132. Develop and implement a stakeholder communications plan that includes community engagement before work commences on site. 133. Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager. 134. Display the head or regional office contact information 135. Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The DMP may include monitoring of dust deposition, dust flux, real-time PM10 continuous monitoring and/or visual inspections. Site Management: 136. Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. 137. Make the complaints log available to the local authority when asked. 138. Record any exceptional incidents that cause dust and/or air emissions, either on or offsite, and the action taken to resolve the situation in the logbook. 139. Hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/ deliveries which might be using the same strategic road network routes. Monitoring: 140. Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary. 141. Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked 142. Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions 143. Agree dust deposition, dust flux, or real-time PM10 continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.

Preparing and Maintaining the Site:

- 144. Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- 145. Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- 146. Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period
- 147. Avoid site runoff of water or mud.
- 148. Keep site fencing, barriers and scaffolding clean using wet methods
- 149. Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below
- 150. Cover, seed or fence stockpiles to prevent wind whipping.

Operating Vehicle/Machinery and Sustainable Travel

- 151. Ensure all vehicles switch off engines when stationary - no idling vehicles
- 152. Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable
- 153. Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas
- 154. Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials
- 155. Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)

Operations:

- 156. Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- 157. Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- 158. Use enclosed chutes and conveyors and covered skips.
- 159. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate
- 160. Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods

Waste Management:

- 161. Avoid bonfires and burning of waste materials.

Measures Specific to Demolition:

162. Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).

163. Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.

164. Avoid explosive blasting, using appropriate manual or mechanical alternatives.

165. Bag and remove any biological debris or damp down such material before demolition.

Measures Specific to Earthworks:

167. Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.

168. Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable

169. Only remove the cover in small areas during work and not all at once

Measures Specific to Construction:

170. Avoid scabbling (roughening of concrete surfaces) if possible

171. Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.

172. Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.

173. For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.

Measures Specific to Trackout:

174. Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use

175. Avoid dry sweeping of large areas.

176. Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.

177. Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.

178. Record all inspections of haul routes and any subsequent action in a site logbook.

179. Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.

180. Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).

181. Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.

182. Access gates to be located at least 10 m from receptors where possible.

Operational	
Chapter 8: Noise and Vibration	
Construction	183. The contractor will be required to implement the control measures recommended in BS 5228 and apply the appropriate measures where applicable. 184. Working hours during site construction operations will be restricted to daytime hours from 07:30 hours to 18:00 hours (Monday to Friday) and, as may be required, from 08:00 hours to 13:00 hours (Saturdays). Evening and night-time work is not expected to take place. 185. An on-site speed limit will be enforced for all traffic. Drivers of vehicles will be advised of the speed limits through the erection of signs i.e. a typically recommended on site speed limit is 10 km/hr. 186. Where practicable, the use of quiet working methods and the most suitable plant will be selected for each activity having due regard to the need for noise control. 187. Best practicable means will be employed to minimise noise emissions and will comply with the general recommendations of BS 5228. To this end operators will use “noise reduced” plant and/or will modify their construction methods so that noisy plant is unnecessary. 188. By positioning potentially noisy plant as far as possible from noise sensitive receivers the transmission of sound can be minimised. Earth mounds and/or stockpiles of material or perimeter fencing on site can be used as a physical barrier between the source and the receiver. 189. Mechanical plant used on site will be fitted with effective exhaust silencers. Vehicle reverse alarms will be silenced appropriately in order to minimise noise breakout from the site while still maintaining their effectiveness. 190. All plant will be maintained in good working order. Where practicable, machines will be operated at low speeds and will be shut down when not in use. 191. Compressors will be of the “noise reduced” variety and fitted with properly lined and sealed acoustic covers. 192. In all cases engine and/or machinery covers will be closed whenever the machines or engines are in use. 193. All pneumatic percussive tools will be fitted with mufflers or silencers as recommended by the equipment manufactures. Where practicable, all mechanical static plant will be enclosed by acoustic sheds or screens. 194. Employees working on the site will be informed about the requirement to minimise noise and will undergo training on the following aspects: 195. The proper use and maintenance of tools and equipment. 196. The positioning of machinery on-site to reduce the emission of noise to the noise sensitive receivers. 197. Avoidance of unnecessary noise when carrying out manual operations and when operating plant and equipment. 198. The use and maintenance of sound reduction equipment fitted to power pressure tools and machines. 199. Where excessive noise levels are recorded, further mitigation measures will be employed which may include temporary wooden hoarding / acoustic screening to be installed to a height of no less than 2.5m around areas of construction where loud noise levels occur.

	200. The contractor will ensure that the TII Guidelines which identify limits for protection against cosmetic damage as a function of vibration frequency are not exceeded through the use of the selected low vibration piling method. 201. Responsible Person – The Contractor will appoint a responsible and trained person who will be present on site and who will be willing to answer and act upon complaints and queries from the local public. 202. Night-time Working - If there are items of plant (e.g. dewatering pumps and similar) in use during night-time hours they will be chosen, sited and enclosed such that levels at the nearest properties do not exceed the measured background noise levels.
Operational	203. Where deemed necessary due to excessive impact or complaints received, noise and vibration monitoring will be undertaken during construction works to determine noise and vibration levels at sensitive receivers. On the basis of the findings of such noise and vibration monitoring, appropriate noise and vibration mitigation measures will be implemented to reduce noise and vibration impacts
Chapter 9: Material Assets	
Construction	204. A Construction Stage Traffic Management Plan will be developed and agreed with South Dublin County Council prior to undertaking any construction works 205. A combined 5m wide utility trench will include a tree root barrier on the northern side to prevent damage to utilities from proposed compensation woodland planting in the pNHA 206. A Construction Waste Management Plan will be produced by the appointed contractor 207. A site-specific Construction Environmental Management Plan (CEMP) will be prepared by the appointed contractor in advance of the works
Operational	208. A Workplace Travel Coordinator will be appointed
Chapter 10: Archaeological and Architectural Heritage	
Construction	209. A Conservation Architect will supervise all works affecting protected structures and heritage fabric. Contractors with experience with protected structures and heritage fabric shall undertake conservation works. 210. All works will be undertaken with the detailed methodologies set out in Carrig Volume 2: Conservation Repair Methodology and Specification. Historic Farm Building Demolition: 211. Prior to demolition, a Full Level 3 building recording will be carried out. 212. Any reusable materials will be salvaged and catalogued for reuse within the development. 213. Archival record will be deposited with the Planning Authority and National Inventory of Architectural Heritage. Sections of Walled Garden Removal 214. Removal will be limited to the extents shown on approved drawings. 215. Masonry will be dismantled by hand. 216. Stone will be salvaged, stored and reuse within reinstated or new boundary

treatments.

217. Carry out pre-removal recording in line with Appendix 10.

Boundary Wall and Bell Tower Alterations

218. Detailed method statements for all interventions will be prepared in advance.

219. Adopt a minimum intervention approach.

220. Ensure all materials used are lime-based and compatible.

221. Retain the maximum extent of historic fabric.

222. Ensure all works are undertaken by a specialist conservation contractor.

Protected Structures Works

223. All works will be carried out in accordance with the Conservation Repair Methodology and Specification.

224. Prioritise the retention of historic fabric.

225. Use breathable materials, including lime mortars, renders, and appropriate joinery repair techniques.

226. Avoid unnecessary replacement of original elements.

227. Maintain ongoing supervision of the works by the conservation architect.

Modern Structures Removal

228. Implement a controlled demolition sequence.

229. Provide protection measures to safeguard adjacent historic fabric.

230. Carry out pre-demolition condition surveys of adjacent protected structures.

Construction Activity (Vibration / Damage risk)

321. Establish exclusion zones around protected structures.

322. Undertake pre- and post- construction surveys.

323. Implement vibration monitoring where works occur in proximity to historic fabric.

324. Restrict the use of heavy plant near protected structures.

325. Install temporary protective measures, including hoarding, padding, and bracing.

Temporary Visual and Setting Impacts

326. Position site compounds and storage areas to avoid key heritage features.

327. Minimise the extent and duration of scaffolding.

328. Maintain good site housekeeping practices at all times.

329. Remove all temporary works immediately following completion of their use.

Disturbance of Known Archaeology

330. Provide full-time archaeological monitoring of all ground disturbance works.

331. Implement the agreed mitigation strategy in accordance with the ACAS report.

332. Preserve archaeological remains in situ where feasible.

333. Undertake preservation by record (archaeological excavation) where in-situ preservation is not possible.

334. Report all archaeological findings and outcomes to the National Monuments Service.

	Unknown Archaeology 335. Apply the same archaeological monitoring regime as set out above. 336. Cease all works immediately in the event of an archaeological discovery. 337. Establish buffer zones around the find where required. 338. Agree an appropriate mitigation strategy with the National Monuments Service prior to resumption of works.
Operational	New Hospital Building within Historic Setting 339. Locate the new building within the existing walled-garden footprint to contain visual and physical impact. 340. Limit the building height to one-two storeys. 341. Protect and retain key views to and from protected structures. 342. Incorporate retained historic walls into the building design. 343. Design the landscape to reflect historic enclosure patterns. Historic Farm Building Loss 344. Develop and implement an interpretation strategy to record and communicate the former building, including signage and use of archival material. 345. Reuse salvaged materials on site. 346. Retain the former building footprint within the landscape where practicable. Retention of St. Edmundsbury House 347. Implement ongoing maintenance plan. 348. Ensure the building remains in active use to support its long-term viability. 349. Carry out all repairs in accordance with conservation best practice. Adaptive Reuse of Outbuildings 350. Adopt a minimal-intervention approach. 351. Retain the structural form and character of the outbuildings. 352. Use compatible materials and detailing appropriate to the historic fabric. 353. Design and implement interventions to be reversible where feasible. Alteration to Walls and Garden 354. Undertake conservation repair of all retained sections. 355. Incorporate salvaged stone into new works where appropriate and feasible. 356. Ensure a clear distinction between historic fabric and new interventions. 357. Retain and reinforce the legibility of the historic layout. Removal of Modern Accretions 358. Remove elements carefully to avoid damage to underlying historic fabric. 359. Repair and reinstate original materials wherever possible. Changes to Setting 360. Design the landscape plan with reference to the historic layout. 361. Retain and reinforce existing boundary treatments. 362. Design external lighting sensitively to avoid visual and heritage impacts. 363. Control the design, placement, and extent of signage and external fixtures.

Chapter 11: Landscape and Visual Amenity

Construction	364. New structural tree and woodland planting along the Lucan Road frontage, the eastern access route adjoining St Andrew's National School and the western boundary towards The Village Montessori Preschool. 365. Reinforcement of internal estate planting, including avenue trees, woodland edge planting and native hedgerows that reflect historic field boundaries 366. External materials, colours and boundary treatments, to be natural earth tone in colour, with recessive finishes and natural materials that sit comfortably within the woodland setting. 367. External lighting design, to avoid unnecessary light spill into the surrounding woodland and Liffey Valley and to minimise night-time visual intrusion



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