

and pedunculate oak) will allow for the development of roosting and foraging habitats to establish over time.

- TM2: The tree root protection areas as defined in BS 5837:2012, will be maintained so as to avoid compaction from human traffic.

6.5.2.2.7 Wildflower Meadows

Mitigation for removal of grassland:

- WMM1: Pollinator friendly wildflower meadow areas will be encouraged to develop with native species along the peripheries of grassy areas, of which in total there will be 1572m². Mowing of grassy areas should ideally follow the advice given in the All-Ireland Pollinator Plan Advice to Councils (NBDC, 2021), which gives a variety of grass management options, including the six-week meadow. This allows five cuts to occur at specific periods in April, May, July, August and October, with grass cuttings removed to encourage wildflowers to grow.

6.5.2.3 Terrestrial mammals

As the proposed development will not result in any significant effect on the local small mammal population during construction or operation, no mitigation measures are required.

6.5.2.4 Bats

- BM6: Lighting proposals for the operational phase have been reviewed as part of this biodiversity assessment. The lighting columns will be fitted with baffles as appropriate to minimise light spill to retained/replanted trees and hedgerows and outside the proposed development site boundary to below 3 lux and include not orientating fittings above the horizontal plain.
- BM7: Although no bat roosts were confirmed during the surveys and the potential for same was considered as being of low suitability, additional roosting opportunities for bats are proposed, to include 3 no. Schwegler 2F bat boxes⁹ to be erected on suitable retained trees in suitable locations across the site, the location of which to be decided by a suitably qualified and experienced bat ecologist. The boxes will be installed on the tree at a height of 3-5 and firmly fixed to tree trunk: -
 - Where practicable, the bat boxes will be installed in an East, South and West orientation and protected from undue disturbance by selective placement away from light spill and at a height >3.5m.
 - There will be 1m clearance (e.g. no overhanging branches or ivy encroachment near installed box) around each bat box opening.
 - Installed bat boxes will be labelled and data (reference number, GPS location and photographic record) will be supplied to Bat Conservation Ireland (BCI), Local Authority Biodiversity Officer and NPWS.
 - BM7 has been proposed as an enhancement measure for the proposed development site rather than a mitigation measure as no confirmed roosting sites have been identified.

6.5.2.5 Birds

- BBM3: In order to provide additional nesting opportunities for birds whilst the new planting is established, 3 no. 1B Schwegler nest boxes¹⁰ or similar will be installed within the proposed development site. The nest boxes will be installed at a minimum of 3m above ground level to ensure against disturbance from humans and domestic animals such as cats. The boxes will be deployed across the site in appropriate locations, as advised by a suitably qualified ecologist.

⁹ Bat boxes are available to purchase online from NHBS www.nhbs.com and similar websites

¹⁰ Bird boxes are available to purchase online from NHBS www.nhbs.com and similar websites

6.6 Cumulative Impact

The subject lands are currently zoned as *MRE- Metro and Rail Economic Corridor* with the zoning objective to *“Facilitate opportunities for high-density mixed-use employment generating activity and commercial development, and support the provision of an appropriate quantum of residential development within the Metro and Rail Economic Corridor”* within the Fingal Development Plan 2023-2029. The lands immediately surrounding the proposed development site are also zoned as *“MRE- Metro and Rail Economic Corridor”*. Santry Demesne is located approximately 180m north of the proposed development site and this is zoned as *“OS- Open space”* to *“Preserve and provide for open space and recreational amenities”*. Lands to the east and south of the development site comprise a mixture of *“RA – Residential Area”* to *“Provide for new residential communities subject to the provision of the necessary social and physical infrastructure”* and *“OS – Open Space”*.

There are numerous granted planning permissions for residential and industrial developments in the vicinity of the proposed site. The subject development is located adjacent to a residential development recently constructed by the applicant. Permission for 374 no. residential units on a 7 hectare site under Ref. F15A/0440 was modified by Ref. F16A/0572, F17A/0371 and F18A/0205 resulting in the overall provision of 355 no. residential units which are now complete. In addition, 329 no. units were permitted (ABP Ref. 306075-19) at Blackwood Square proximate to the subject site on lands under the control of the subject applicant. In April 2021 the terms of conditions attached were altered under case Ref. ABP-309416-21 resulting in the number of apartments increasing to 330 no. units. These are currently under construction and construction is expected to be completed prior to the commencement of development of the subject proposals. This residential development and other residential and industrial developments in the vicinity are likely to be in construction at the same time as the proposed development. In this case, there is potential for cumulative impacts to arise, as a consequence of the proposed development acting in-combination with other plans and projects, on water quality in the downstream surface water environment and on disturbance to fauna. It is considered that these potential cumulative impacts would be temporary and occur at a significant local geographical scale.

There is also potential for cumulative impacts on fauna in the area to arise as a result of fragmentation of treelines. It is considered that these potential cumulative impacts would be permanent and occur at the local geographic scale.

Projects already under way were subject to consent, which was required to comply with requirements of the EIA and Habitats Directive as relevant. Future projects that might come on stream would be required to demonstrate compliance with all applicable planning and environmental approval requirements and be in accordance with the objectives and policies of the relevant land use plans (Development Plans, Local Area Plans etc.). These land use plans contain objectives and policies to ensure the protection of European sites and biodiversity in general. Considering the protective environmental policies contained within the Fingal Development Plan 2023-2029 as the key land planning guidance (being cognisant of higher level plans and projects that may also be required), and that alone the proposed development will not adversely affect the integrity of any KER, no in-combination is predicted between the proposed development and projects consented or that may be approved in the future.

Thus, no in-combination impacts in respect of the proposed development is expected, given the full implementation of the design and project-specific mitigation measures described herein.

6.7 Residual Impact

6.7.1.1 Habitats

Although the hedgerow habitat will be lost during the construction phase, following the implementation of mitigation measures to reinstate hedgerows, residual impacts are considered to be reduced but will remain significant at a local level until such time that replanted hedges mature.

Following the implementation of mitigation measures described in **Section 6.5** of this chapter to protect remaining trees and replace those removed, residual impacts on treelines are considered to be reduced but will remain significant at a local level until such time that they mature.

There will loss of woodland habitat associated with the temporary car park in the northwest of the proposed development site. Many of the trees are damaged and all have been extensively disturbed by prior attenuation works. Following measures including the creation of a micro woodland, residual impacts are

considered to be reduced but will remain significant at a local level until such time that the recreated woodland and trees mature.

6.7.1.2 Terrestrial mammals

As the proposed development will not result in any significant effect on the local small mammal population, no significant residual impacts are predicted at any geographic scale.

6.7.1.3 Bats

Following the implementation of mitigation measures described in **Section 6.5** of this chapter, residual impacts on bats are considered to be reduced but will remain significant at a local geographic level. This is due to habitat fragmentation through the loss of woodland, hedgerows and treelines, which reduces the proposed development sites potential for use by bats as a commuting, roosting and foraging route.

6.7.1.4 Birds

Following the implementation of mitigation measures described in **Section 6.5** of this chapter, residual impacts on birds are considered to be reduced but will remain significant at a local geographic level during construction and until such time that birds make use of newly created habitats and landscaping on site. This is due to habitat fragmentation through the loss of woodland, hedgerows and treelines, which reduces its suitability for use by birds as a breeding and foraging route.

6.8 Monitoring

Where deemed necessary a suitably experienced and qualified ecologist will be retained by the appointed contractor. The ecologist will advise the appointed contractor on ecological matters during construction, undertake preconstruction surveys as necessary, communicate all findings in a timely manner to the appointed contractor and statutory authorities, acquire any licenses/consents required to conduct the work, and supervise and direct the ecological measures associated with the proposed development.

Given the nature of the proposed development and the mitigation/enhancement measures proposed, no monitoring in general will be required. Pre-construction surveys for breeding birds (**Section 6.5.1.2**) and tree PRFs (**Section 6.5.1.3**) will be carried out as described in the respective sections above. Two years post installation of landscape planting, monitoring of the vegetation (particularly trees) will be carried out to determine the efficacy of the planting design by the landscape contractor.

During construction, weekly checks will be carried out by the site manager to ensure surface water drains are not blocked by silt, or other items, and that all storage is located at least 10m from surface water receptors. A regular log of inspections will be maintained, and any significant blockage or spill incidents will be recorded for root cause investigation purposes and updating procedures to ensure incidents do not reoccur.

6.9 Conclusion

The proposed development does not have the potential to result in significant negative effects (either directly or indirectly) on the integrity of any European site, whether considered on its own or in combination with any other plans or projects. The consideration of effects on European sites has been made in the absence of reliance on mitigation measures.

The proposed development does not have the potential to result in significant negative effects on nationally designated areas for nature conservation, whether considered on its own or in combination with any other plans or projects.

The proposed development has no potential to affect the surface water quality or the ecology of the adjacent waterbodies as the surface water discharge will be reduced to green field levels. The surface water systems are designed in accordance with the principles of SUDS as recommended in the Greater Dublin Strategic Drainage Study.

The proposed development will result in habitat loss within the proposed development boundary. Considering the relatively small areas of habitat lost (c. 260m² of woodland, c. 21 metres of hedgerow, and 50 trees), proposed mitigation measures outlined in **Section 6.5** Mitigation Measures, and the proposed landscape plans which include planting of hedgerows, woodland and treelines (194m² of a "micro woodland", planting 120 no. semi-mature trees and 40 no. multi-stem trees (native or varieties of native species), and

420m of linear hedge), and the provision of pollinator-friendly planting, residual impacts are considered to be reduced but will remain significant at a local level until such time that the replanted woodland, trees and hedgerows mature.

As the proposed development will not result in any significant effect on the local small mammal population, no significant residual impacts are predicted at any geographic scale.

Following the implementation of mitigation measures, residual impacts on bats are considered to be reduced but will remain significant at a local geographic level during construction and until such time that bats make use of newly created habitats and landscaping on site.

Following the implementation of mitigation measures, residual impacts on birds are considered to be reduced but will remain significant at a local geographic level during construction and until such time that birds make use of newly created habitats and landscaping on site.

A comprehensive suite of mitigation measures is proposed, in addition to the extensive and stringent environmental control measures that have been incorporated into the design of the proposed development. All of the mitigation measures will be implemented in full and are best practice, tried and tested, and effective control measures to protect biodiversity and the receiving environment. It is recommended that all mitigation measures included within this report are committed to and delivered through the planning conditions.

Considering the elements included within the design of the proposed development (as described in **Section 6.2**), and the implementation of the mitigation measures proposed in **Section 6.5** to avoid or minimise the effects of the proposed development on the receiving ecological environment, no significant residual ecological effects are predicted. The proposed development complies with relevant biodiversity policies of the Fingal County Development Plan 2023-2029 (FCC, 2023) considered in this report (see Appendix 6.4).

6.10 References

- Atherton, I., Bosanquet, S. & Lawley, M. (eds.) (2010) Mosses and liverworts of Britain and Ireland. A field guide. Plymouth, British Bryological Society.
- Benson, L. (2009) *Use of Inland Feeding Sites by Light-bellied Brent Geese in Dublin 2008-2009: A New Conservation Concern?* Irish Birds 8: 563-570.
- Byrne, A.W., Sleeman, D.P., O'Keeffe, J. and Davenport, J. (2012). THE ECOLOGY OF THE EUROPEAN BADGER (MELES MELES) IN IRELAND: A REVIEW. *Biology and Environment: Proceedings of the Royal Irish Academy*, [online] 112B(1), pp.105–132.
- CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal, and Marine*. Chartered Institute of Ecology and Environmental Management, Winchester.
- CIEEM (2019) *Advice Note on the Lifespan of Ecological Reports & Surveys*. Chartered Institute of Ecology and Environmental Management, Winchester, England
- Colhoun, K. & Cummins, S. (2014) *Birds of Conservation Concern in Ireland 2014 -2019*. BirdWatch Ireland.
- Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*. The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1
- Enviroguide (2019) *Natura Impact Statement for Proposed Strategic Housing Development at St. Paul's College, Sybil Hill Road, Raheny, Dublin*.
- Environmental Protection Agency (2017) *Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports*. Available at: <https://www.epa.ie/pubs/advice/ea/EPA%20EIAR%20Guidelines.pdf>
- European Commission (1991) Council Directive 91/271/EEC of 21 May 1991 concerning urban wastewater treatment.
- FCC (2006) *A mammal assessment of Fingal Woodland including sites at Balbriggan, Gormanstown, Portrane, Howth, Malahide and Santry*.

- FitzPatrick, Ú., Murray, T.E., Byrne, A., Paxton, R.J. and Brown, M.J.F. (2006) Regional Red List of Irish Bees. Report to National Parks & Wildlife Service (Ireland) and Environment & Heritage Service (N. Ireland).
- Fossitt, J.A. (2000) *A Guide to Habitats in Ireland*. Heritage Council.
- Gilbert, G., Stanbury, A., Lewis, L. (2021). Birds of Conservation Concern in Ireland 4: 2020–2026. Irish Birds 9: 523-544.. RSPB Great Britain and Birdwatch Ireland.
- Haigh, A., Butler, F. & O’Riordan, R. (2012) Intra and inter habitat differences in hedgehog distribution and potential prey availability, *Mammalia* 76:3.
- Hayden, T., Harrington, R. and Clarke, B., (2000). *Exploring Irish mammals*. Dublin: Town House.
- J.B. Barry and Partners Engineering Ltd. March (2022) Flood Risk Assessment of Swift Square Apartments LRD, Northwood, Santry Demesne, Dublin 9,.
- Kelleher, C. & Marnell, F. (2006) Bat Mitigation Guidelines for Ireland. *Irish Wildlife Manuals, No. 25*. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.
- King, J.L., Marnell, F., Kingston, N., Rosell, R., Boylan, P., Caffrey, J.M., FitzPatrick, Ú., Gargan, P.G., Kelly, F.L., O’Grady, M.F., Poole, R., Roche, W.K. & Cassidy, D. (2011) *Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- Macklin, R., Brazier, B. & Sleeman, P. (2019). Dublin City otter survey. Report prepared by Triturus Environmental Ltd. for Dublin City Council as an action of the Dublin City Biodiversity Action Plan 2015-2020.
- Marnell, F., Looney, D. & Lawton, C. (2019) *Ireland Red List No. 12: Terrestrial Mammals*. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland.
- Morris, P.A. & Reeve, N.J. (2008) Hedgehog (*Erinaceus europaeus*). Pp 241-249. In Harris, S & Yalden, D.W. (Eds) *Mammals of the British Isles: Handbook, 4th Edition*, The Mammal Society, Southampton.
- Mullarney, K., Svensson, L., Zetterstrom, D. & Grant, P.J. (2009) *Collins Bird Guide: The Most Complete Guide to the Birds of Britain and Europe*. 2nd Edition.
- National Biodiversity Data Centre (NBDC) (2021) All Ireland Pollinator Plan, 2015-2020: Councils – actions to help pollinators. Available at: https://pollinators.ie/wordpress/wp-content/uploads/2018/05/Councils_actions-to-help-pollinators-2018-WEB.pdf
- National Roads Authority (2006a) *Best Practice Guidelines for the Conservation of Bats in the Planning of National Roads Schemes*. National Roads Authority (Now part of Transport Infrastructure Ireland), Dublin.
- National Roads Authority (2006b) Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes. National Roads Authority (Now part of Transport Infrastructure Ireland), Dublin.
- National Roads Authority (2009) *Guidelines for Assessment of Ecological Impacts of National Roads Schemes*. National Roads Authority (Now part of Transport Infrastructure Ireland), Dublin.
- NPWS (2010). Circular NPW 1/10 & PSSP 2/10 Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Department of Environment, Heritage and Local Government, March 2010.
- NPWS (2011) Site Synopsis: Santry Demesne (000178)
- Parnell, J. and Curtis, T. (2012). *Webb’s An Irish Flora*. Cork University Press, Youngline Industrial Estate, Pouladuff Road, Togher, Cork, Ireland. ISBN-978-185918-4783.
- Regan, E.C., Nelson, B., Aldwell, B., Bertrand, C., Bond, K., Harding, J., Nash, D., Nixon, D., & Wilson, C.J. (2010) *Ireland Red List No. 4 – Butterflies*. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Ireland.
- Rich, C. and Longcore, T. (2005) *Ecological Consequences of Artificial Night Lighting*. Island Press. ISBN-9781559631297

- Roche N., Aughney T., Marnell, F. & Lundy, M. (2014) Irish bats in the 21st Century. Bat Conservation Ireland, Virginia, Co. Cavan.
- Russ, J. (2012) *British Bat Calls: A Guide to Species Identification*. Pelagic Publishing, Exeter.
- Scott Cawley (2023) *Appropriate Assessment Screening Report*. Swift Square Apartments Large-scale Residential Development, Northwood, Santry, Dublin 9.
- Scott Cawley Ltd. (2017). Natura Impact Statement – Information for Stage 2 Appropriate Assessment for the Proposed Residential Development St. Paul's College, Sybill Hill, Raheny, Dublin 5.
- Sleeman, D.P. (1991) Home ranges of Irish stoats. *Irish Naturalists' Journal* 23: 486-488
- Sleeman, D.P. (1993) Habitats of the Irish stoat. *Irish Naturalists' Journal* 24: 318-321
- Smith, F., O'Donoghue, P., O'Hora, K. and Delaney, E. (2011) *Best Practice Guidance for Habitat Survey and Mapping*. The Heritage Council: Kilkenny
- Smith, G.F., O'Donoghue, P., O'Hora, K. & Delaney, E. (2011) *Best Practice Guidance for Habitat Survey and Mapping*. The Heritage Council Church Lane, Kilkenny, Ireland.
- Stace, C. (2019) *New Flora of the British Isles*. 4th Edition. Cambridge University Press, Cambridge.
- The Tree File Consultant Arborists Ltd. (2023) Arboricultural Report of Swift Square Apartments LRD, Northwood, Santry, Dublin 9.
- Weekes, L.C. & FitzPatrick, Ú. (2010) *The National Vegetation Database: Guidelines and Standards for the Collection and Storage of Vegetation Data in Ireland*. Version 1.0. Irish Wildlife Manuals, No. 49. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

7 LAND, SOILS AND HYDROGEOLOGY

7.1 Introduction

Chapter 7 (Land, Soils and Hydrogeology) outlines the environmental effects of the proposed residential project on the Land and Soils environment including Hydrogeology.

7.1.1 Author Information

Kieran O'Dwyer is an Associate Director with J. B. Barry responsible for the environmental and hydrogeological and land and soils elements of development projects. He holds a degree in civil engineering from University College Dublin (1981). He has over 38 years' experience in environmental and hydrogeological consultancy (J. B. Barry and Partners (JBB), WYG and K. T. Cullen) and has managed the environmental element of numerous infrastructure projects throughout Ireland (including the Ringsend Wastewater Treatment Plant (WwTP) Upgrade Project and the Associated Regional Biosolids Facility (Land and Soils and Water), The Lesotho Highlands Water Project, the N81 Route Selection Study and Moville Greencastle Sewerage Scheme Planning Application and EIAR). He carried out the hydrology and hydrogeology assessment for the Greater Dublin Drainage EIAR (and oral hearing) and has presented specialist evidence at numerous other oral planning hearings. He has also provided expert witness testimony relating to hydrogeological issues in the High Court and District Court. He has presented technical papers on groundwater to Engineers Ireland and the International Association of Hydrogeologists (IAH), as well as providing workshops on groundwater vulnerability and source protection to various local authorities and the Environmental Protection Agency.

7.1.2 Scoping

Scoping of the proposal identified the following issues for consideration in the EIA Report:

This section outlines the environmental effects of the proposed residential project (described in **Chapter 5** of Volume 2 of this EIAR) on the Land and Soils environment (including Hydrogeology).

- What will the land take be?
- What are the baseline characteristics of the soil, geology and hydrogeology of the subject site and its environs in the context of its local and regional geological setting?
- What are the implications of inserting the proposed development on the soil, geology and hydrogeology of the subject site and its environs?

7.2 Assessment Methodology

This section of the EIAR was prepared having regard to:

- *Guidelines on the Information to be contained in Environmental Impact Statements* (EPA, 2002);
- *Advice Notes on Current Practice in the preparation of Environmental Impact Statements* (EPA, 2003);
- *Advice Notes for Preparing Environmental Impact Statements* (Draft) (EPA, September 2015); and
- *Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* (NRA, 2009).
- *Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements* (IGI 2013)

The following methods were used in assessing the baseline conditions and potential impact on the land, soils and hydrogeological environments;

Desk-top study

Information on the land, soils and hydrogeology has been obtained from the following sources:

- Geological Survey Ireland (GSI) Bedrock Geological Map of Ireland;
- GSI Groundwater and Geology Mapping Databases;

- GSI Quaternary Geology Map of Ireland;
- Environmental Protection Agency (EPA) – website mapping and database information;
- National Parks and Wildlife Services (NPWS) – Protected Site Register;
- Ground Investigations Ireland; Santry Demesne, Northwood Ground Investigation Report;

Site-specific site investigations

Site-specific investigations have been carried out to establish subsurface conditions at the site and these are summarised below in **Table 7.1**.

Table 7.1: Site Investigation Summary

Contractor	Description of Investigation	Details of Investigation	Date of Works
Ground Investigations Ireland	Swift Square, Northwood, Site Investigation Works	<ul style="list-style-type: none"> • 2 No. Trial Pits • 2 No. Cable Percussion Boreholes • Geotechnical and Environmental Laboratory testing • Waste Classification Report 	July 2022

The Site Investigation Report which was prepared by Ground Investigation Ireland Ltd following site investigation works undertaken in July 2022, was reviewed and used and assisted in the development of a conceptual model of the subsurface conditions.

7.2.1 Assessment Approach

The aspects of the project that interact with and effect the receiving/existing land and soils environment were examined.

The likely significant effects of the proposed development on land, soils and hydrogeology are discussed, and the measures to mitigate adverse impacts are described. Adverse impacts are those that result in a detrimental effect to the current environment, i.e., deterioration in groundwater quality, contamination of soils. The effects are assessed terms of Quality, Significance, Magnitude, Probability, Duration, and Types. This approach considers both the importance of each environmental receptor and the magnitude of the potential environmental impacts arising from the proposed project on that receptor and the significance of the impact.

The attributes and Impacts assessed were;

- Excavation and Earthworks, Surplus and Unsuitable Soils (extent of topsoil and subsoil cover and the potential use of this material on site or requirement to remove it off-site as waste for disposal or recovery).
- Karst Features.
- Classification (regionally important, locally important) and extent of aquifers underlying the study area perimeter and increased risks presented to them by construction and operation related activities associated with aspects such as for example removal of subsoil cover, removal of aquifer (in whole or part), drawdown in water levels, alteration in established flow regimes, change in groundwater quality;
- Groundwater resources. Dewatering and local groundwater supplies.
- Groundwater quality. Vulnerability to contamination.
- Reduction in Recharge area.
- Accidental Spillages - Contamination of Soils and Groundwater.
- Groundwater-fed ecosystems and the increased risk presented by the construction and operational phases of the proposed development both spatially and temporally.
- Landfills and contaminated land within and in the vicinity of the site.
- Economic Geology Quarry reserves.

- Geological Heritage.

7.2.2 Assessment Criteria

This assessment of impacts follows guidelines established by the TII ‘Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (2009)’.

The significance of impacts on specific receptors are considered in terms of the magnitude of the effect/impact of an element of the project on a receptor and the importance of that receptor.

The Criteria for rating the importance of Environmental Attributes are shown in **Table 14.1**.

Table 7.2: Criteria for Rating Importance of Site Attributes - (NRA 2009)

Importance	Criteria	Typical Example
Geology		
Very High	Attribute has a high quality, significance or value on a regional or national scale Degree or extent of soil contamination is significant on a national or regional scale Volume of peat and/or soft organic soil underlying route is significant on a national or regional scale	Geological feature rare on a regional or national scale (NHA) Large existing quarry or pit Proven economically extractable mineral resource
High	Attribute has a high quality, significance or value on a local scale Degree or extent of soil contamination is significant on a local scale Volume of peat and/or soft organic soil underlying route is significant on a local scale	Contaminated soil on site with previous heavy industrial usage Large recent landfill site for mixed wastes Geological feature of high value on a local scale (County Geological Site) Well drained and/or high fertility soils Moderately sized existing quarry or pit Marginally economic extractable mineral resource
Medium	Attribute has a medium quality, significance or value on a local scale Degree or extent of soil contamination is moderate on a local scale Volume of peat and/or soft organic soil underlying route is moderate on a local scale	Contaminated soil on site with previous light industrial usage Small recent landfill site for mixed wastes Moderately drained and/or moderate fertility soils Small existing quarry or pit Sub-economic extractable mineral resource
Low	Attribute has a low quality, significance or value on a local scale Degree or extent of soil contamination is minor on a local scale Volume of peat and/or soft organic soil underlying route is small on a local scale	Large historical and/or recent site for construction and demolition wastes Small historical and/or recent landfill site for construction and demolition wastes Poorly drained and/or low fertility soils Uneconomically extractable mineral resource
Hydrogeology		
Extremely High	Attribute has a high quality or value on an international scale	Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation e.g. SAC or SPA status
Very High	Attribute has a high quality or value on a regional or national scale	Regionally Important Aquifer with multiple wellfields. Groundwater supports river, wetland or surface water body ecosystem protected by national legislation – e.g. NHA status. Regionally important potable water source supplying >2500 homes Inner source protection area for regionally important water source.
High	Attribute has a high quality or value on a local scale	Regionally Important Aquifer. Groundwater provides large proportion of baseflow to local rivers. Locally important potable water source supplying >1000 homes. Outer source protection area for regionally important water source. Inner source protection area for locally important water source.
Medium	Attribute has a medium quality or value on a local scale	Locally Important Aquifer Potable water source supplying >50 homes.

		Outer source protection area for locally important water source.
Low	Attribute has a low quality or value on a local scale	Poor Bedrock Aquifer. Potable water source supplying <50 homes. Potable water source supplying <50 homes.

The magnitude of the effect/impact can be assessed based on the criteria shown in **Table 7.3** and the significance of the impact which is a combination of impact magnitude and attribute importance is show in **Table 7.4**

Table 7.3: Estimation of Magnitude of Impact

Magnitude of Impact Criteria	
Large Adverse	Results in loss of attribute and /or quality and integrity of attribute
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity

Table 7.4: Rating of Significant Environmental Impacts

Importance of Attribute	Magnitude of Impact			
	Negligible	Small Adverse	Moderate Adverse	Large Adverse
Extremely High	Imperceptible	Significant	Profound	Profound
Very High	Imperceptible	Significant/ Moderate	Profound/ Significant	Profound
High	Imperceptible	Moderate/ Slight	Significant/ Moderate	Profound/ Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight/ Moderate

7.3 Baseline Scenario (Existing Environment)

7.3.1 Site Description

It is proposed to construct a new residential development with associated services, access roads and underground car parking. The site is located at Swift Square, Northwood, Santry, Dublin 9, between the existing Swift Square Office Park buildings on Northwood Avenue to the south and Cedarview Housing development to the north. The Santry River flows in an easterly direction to the northeast of the proposed development.

The proposed development can be accessed from the west via Ballymun Road and Northwood Avenue and from the east via Swords Road and Northwood Avenue. The existing site primarily consists primarily of a surface car park for the Swift Square Office Park buildings.

The Huntstown Quarry, which is operated by Roadstone Dublin Ltd., is located approximately 4.5km to the west of the site.

7.3.2 Geology

7.3.2.1 Regional Bedrock Geology

The Regional Bedrock Geology is shown in **Figure 7-1**. The site is underlain by the Lucan Formation comprising dark shaley limestone known as Calp. The Lucan Formation contains regularly NW/SE trending

faults and is bounded to the north by the Tober Colleen Formation (on the opposite side of the M50. The Tober Colleen Formation is made up of calcareous shale and limestone conglomerate. These carboniferous rocks are overlain by low-permeability limestone-derived glacial tills known as the Dublin Boulder Clay.

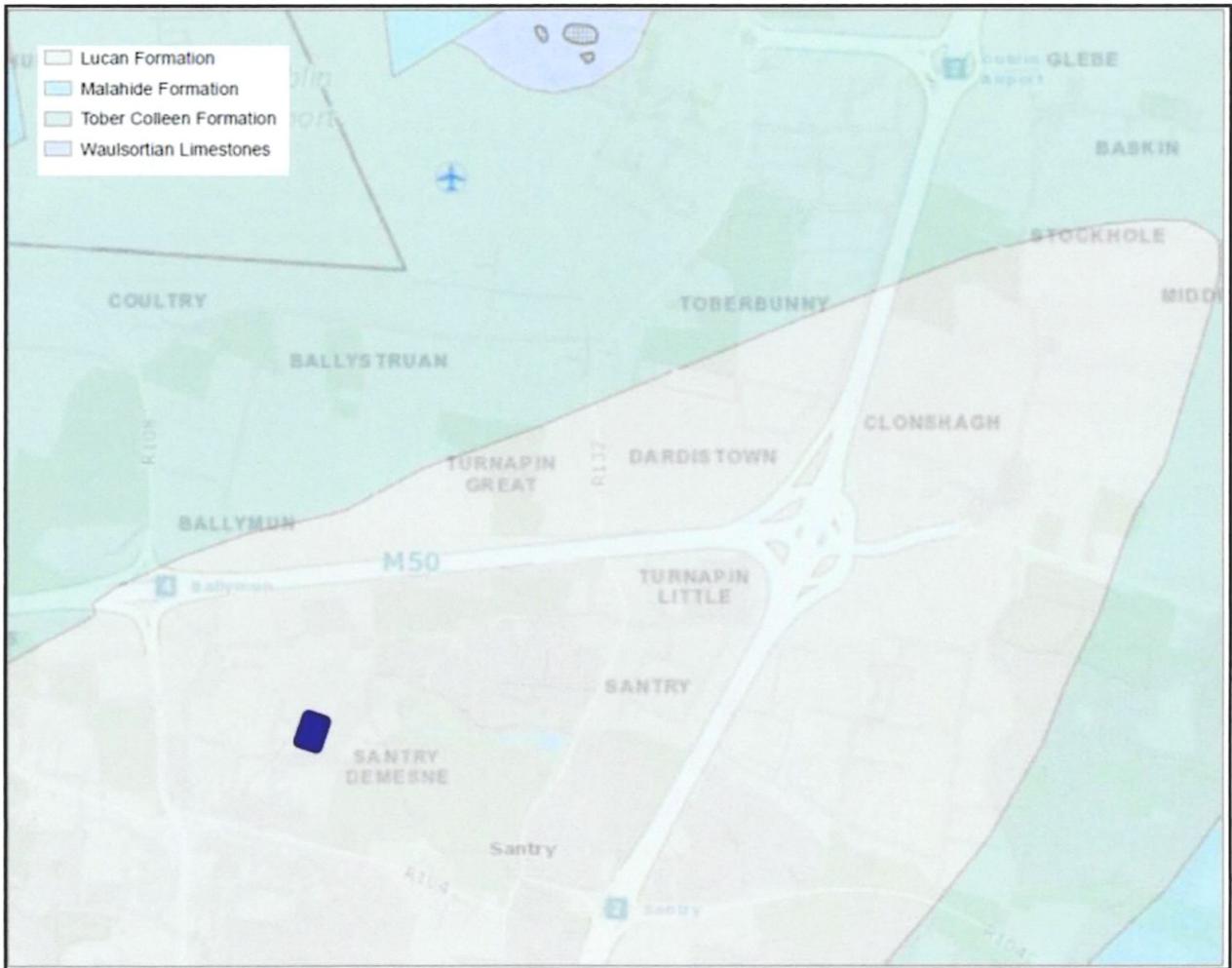


Figure 7-1: Bedrock Geology

Source: GSI web-mapping online viewer www.gsi.ie

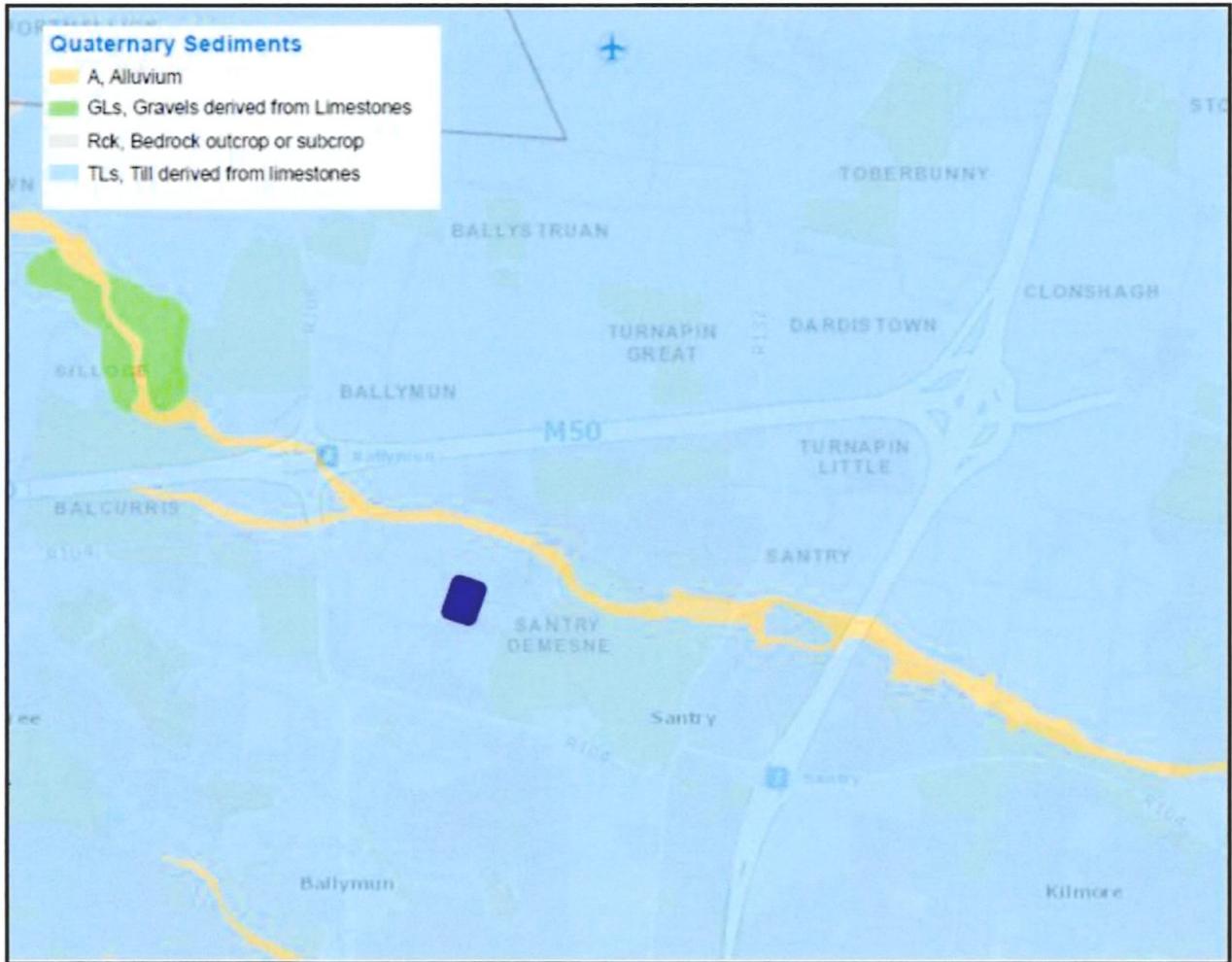


Figure 7-2: Quaternary Geology

Source: GSI web-mapping online viewer www.gsi.ie

7.3.2.2 Encountered Bedrock Geology

Site investigations were undertaken in July 2022 and the report is contained in the **Appendix 7.1** enclosed in Volume 3 (A) of this EIAR. The works included 2 No. Cable Percussion boreholes drilled to a maximum depth of 8.00m BGL and 2No.Trial Pits to a depth of 2.6m BGL. The location of the site investigation works is shown in **Figure 7-3**. The drilling confirmed that the site is underlain by Dublin Boulder Clay.



Figure 7-3: Location of Site Investigation works

Source: GoogleMaps, Annotations by JBB

7.3.2.3 Quaternary Deposits

The GSI Quaternary Geology Map of Ireland (**Figure 7-2**) indicates that the northern portion of the site is underlain by poorly drained limestone tills to the northwest and by well-drained limestone tills to the southeast. Further information was provided by the cable percussive boreholes drilled as part of the 2021 site investigations.

Topsoil/Surfacing:

Topsoil consisting of a sandy gravelly clay was encountered in all the exploratory holes and was present to a maximum depth of 0.20m BGL.

Made Ground

Made ground deposits were encountered in all the exploratory holes beneath the Topsoil/Surfacing and were present to a relatively consistent depth of between 0.40m and 1.10m BGL. These deposits were described generally as *greyish 'brown sandy gravelly clay with occasional angular cobbles and rare subrounded boulders with timber fragments'*.

Cohesive Glacial Tills

Cohesive deposits were encountered beneath the Made Ground in all the exploratory holes. They were described typically as *soft/firm brown sandy slightly gravelly CLAY* overlying a *stiff grey slightly sandy gravelly CLAY with occasional cobbles* and finally a *stiff dark grey/black slightly sandy gravelly CLAY with occasional cobbles*. The strength of the cohesive deposits typically increased with depth and was stiff below 2.50m BGL in all the exploratory holes. These deposits had occasional cobble and boulder content were noted on the exploratory hole logs.

Excavations for the underground car park for the Blackwood Square development currently under construction also encountered a consistent stiff cohesive boulder clay layer at approximately 2.5m BGL. No groundwater inflows were observed, and no dewatering was required. Site investigations were undertaken in September 2021 in relation to the proposed adjacent Whitehaven Development, which is currently under consideration by An Bord Pleanála, also demonstrated similar ground conditions

Firm to stiff cohesive glacial material is considered suitable for building foundations. Any soft organic cohesive till material beneath the proposed building foundations or roads should be excavated to a depth where suitable soils are encountered. No such soft material was encountered.

7.3.2.4 Contaminated Soils

Environmental testing, consisting of the Rilta suite for assessing sample contaminants, was carried out as part of the Site Investigation.

A Waste Classification Assessment was undertaken by Ground Investigations Ireland following the site investigation works. Based on the results of the HazWasteOnLine tool, all material sampled across the site satisfied Category A criteria in accordance with EPA guidelines and can therefore be classified as non-hazardous.

No evidence of soil contamination or illegal dumping was indicated by these analyses.

7.3.3 Summary of Ground Conditions

Using the subsurface information from geotechnical investigations and published data, an inferred conceptual site model has been developed to characterise the soil and rock strata and is presented in **Table 7.5**.

There were no mitigation measures included in the conceptual site modelling.

Based on the regional and site-specific information available, the type of Geological/Hydrogeological Environment as per the IGI Guidelines is:

Type A – Passive geological/hydrogeological environment. (Passive geological environments – areas of thick low permeability subsoils),

Table 7.5: Conceptual Site Model

Unit	Material	Description	Depth to Top of Unit (m bgl)	Range of Unit Thickness* (m)
1	Topsoil	Soft slightly gravelly SILT	0.0	0.2
2	Fill	Grey fine to coarse angular Gravel Fill	0.2	0.2
3	Made ground (possible)	Light brown slightly sandy Clay with timber fragments	0.9m	0.0 - 0.5
4	Firm-Stiff clay	Stiff brown mottled gravelly clay with cobbles.	1.1m	1.4m
5	Cohesive Glacial Tills	Boulder clay	2.5m	>5.0m
6	Bedrock		Unproven	Unproven

7.3.4 Karst Features

Karst is the name given to a landscape characterised by remarkable surface and underground forms, created from the action of the water on the permeable limestones. Surface and underground features occur where fissures and fractures have been widened by dissolution to allow the passage of groundwater. As groundwater flows through fissures and fractures, the rock is dissolved to form caves and caverns of varying sizes that are referred to as 'solution features'.

A review of the GSI karst database indicated there are no karst features within 5km of the proposed site

7.3.5 Economic Geology

There are no active quarries within 4km of the site.

7.3.6 Geological Heritage

A review of the GSI's Geological Heritage Sites, indicated that there are no County Geological Sites (CGS) identified within 4 km of the site.

7.3.7 Radon

The EPA Radon map indicates estimated less than 1% of dwellings will exceed the Reference Level of 200 Bq/m³. This is an extremely low level and indicates that there is no risk from Radon on the proposed site.

7.3.8 Land Use

The area of the proposed development site is 1.205 hA. It's current use primarily consists of surface car parking for the Swift Square Office Park buildings and also an entrance road to the existing Swift Square Office Park building's basement car park.

7.3.9 Hydrogeology

Aquifer classification and groundwater vulnerability classifications are sourced (and refined using site-specific SI data) from the Geological Survey of Ireland (GSI) Groundwater mapping program and refined using the site-specific SI data.

7.3.9.1 Aquifer Classification

The GSI mapping indicates that the proposed site is underlain by the Lucan Formation. The overall GSI aquifer classification (**Figure 7-4**) for this formation is "Li" (locally important aquifer moderately productive only in local zones). The aquifer has no primary porosity, and flow is fracture controlled.

The underlying Groundwater Body (GWB) is the Dublin Groundwater Body (EU code: IE_EA_G_008). This GWB is described as a poorly productive bedrock aquifer. The water quality status of this GWB is "good" and it is not considered at risk of deterioration.

The area is served by public supply water mains, and it is unlikely that the aquifer will be developed for public water supply.

The locally important bedrock aquifer in the Lucan Formation (Calp) is confined by the Dublin Boulder Clay. The low permeability boulder clay deposits above bedrock represent "aquitards" which limit infiltration and restrict percolating water from reaching the bedrock aquifer.

The boulder clay does not constitute an aquifer due to its very low permeability. Boreholes constructed during the site investigations did not encounter any groundwater inflows. There were no groundwater inflows noted during the excavations associated with previous phases Blackwood Square and Bridgefield apartment developments.

The importance of the locally important aquifer is classified as low/moderate.

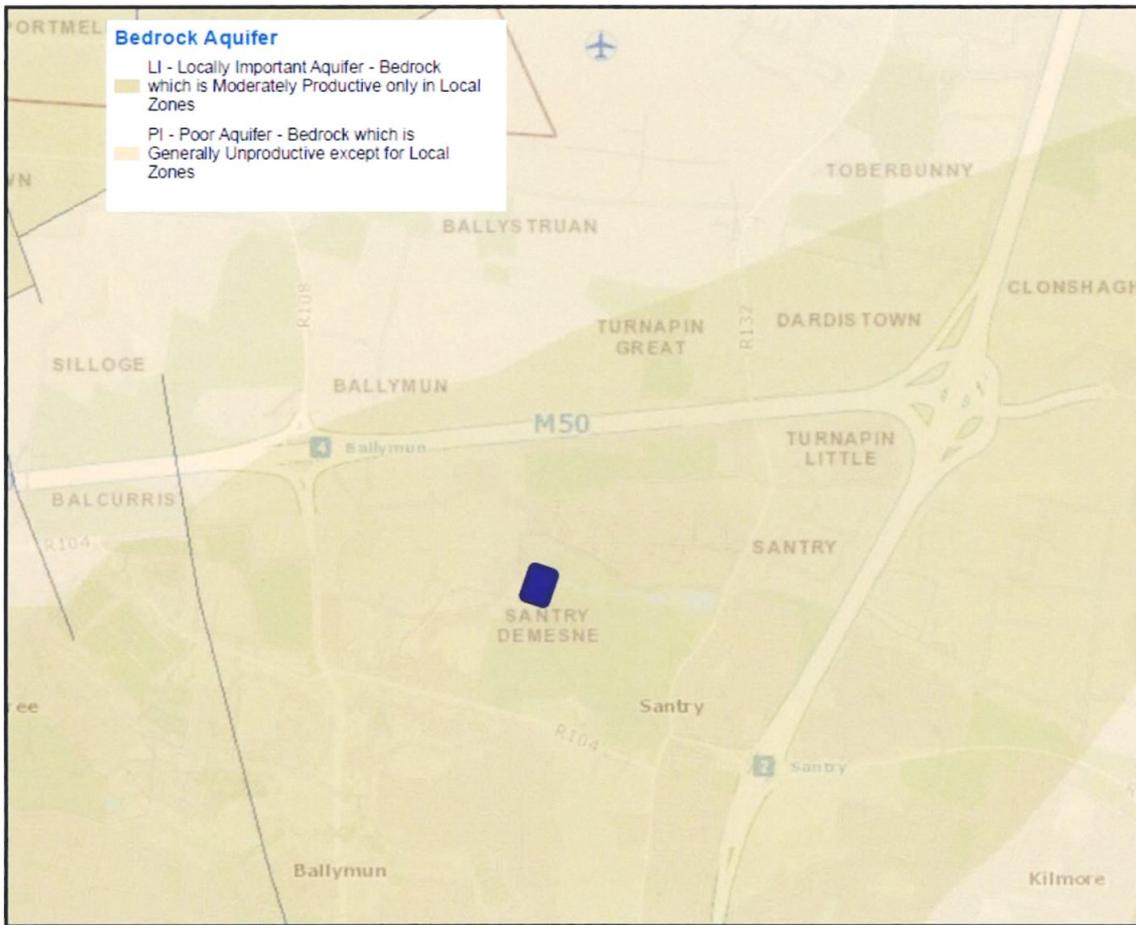


Figure 7-4: Bedrock Aquifers

Source: GSI web-mapping online viewer www.gsi.ie

7.3.9.2 Groundwater Dependent Terrestrial Ecosystems

There are no groundwater-dependent terrestrial ecosystems within 15 km of the proposed site.

7.3.9.3 Groundwater Vulnerability

Groundwater vulnerability provides an indication of the ease at which potential contaminants can migrate downwards from the surface to the underlying aquifer. The GSI groundwater mapping website indicates that the vulnerability (

Figure 7-5) is classified as being “low” (<10m of low permeability overburden).

Table 7.6: GSI Vulnerability Mapping Guidelines

Vulnerability Classification	Subsoil Permeability (Type & Thickness)			Unsaturated Zone	Karst Features
	High permeability (sand/gravel)	Moderate permeability (sandy subsoil)	Low permeability (e.g. subsoil, clay, peat)		
Extreme (E)	0 – 3.0m	0 – 3.0m	0 – 3.0m	0 – 3.0m	-
High (H)	>3.0m	3.0 - 10.0m	3.0 – 5.0m	>3.0m	N/A
Moderate (M)	N/A	>10.0m	5.0 – 10.0m	N/A	N/A
Low (L)	N/A	N/A	>10.0m	N/A	N/A



Figure 7-5: Groundwater Vulnerability (GSI web-mapping online viewer www.gsi.ie).

7.3.9.4 Groundwater Users

There are no public groundwater supply wells within 10km of the site, and consequently there are no associated groundwater source protection schemes within 10km.

The area is served by public water mains, and therefore it is unlikely that there are any water supply wells in the area. The GSI groundwater mapping data base does show some wells in the vicinity. However, there is no record of groundwater wells within 500 km of the site

Figure 7-6). The nearest recorded groundwater wells are on the far side of the M50.

The depths of these wells range from 35 to 92 metres below ground level. Bedrock was encountered from between 10 – 23m bgl. The well yields are reported to be between 87 and 300 m³/day.

7.3.9.5 Groundwater Quality

The groundwater of the Dublin GWB is classified as having ‘Good Status’. The WFD risk score is 2b, ‘Expected to achieve good status’. The samples analysed as part of the site investigation undertaken in 2022 show no evidence of contamination. The results are listed in the Site Investigation and Waste Classification reports enclosed in Volume 3 (A) of this EIAR.

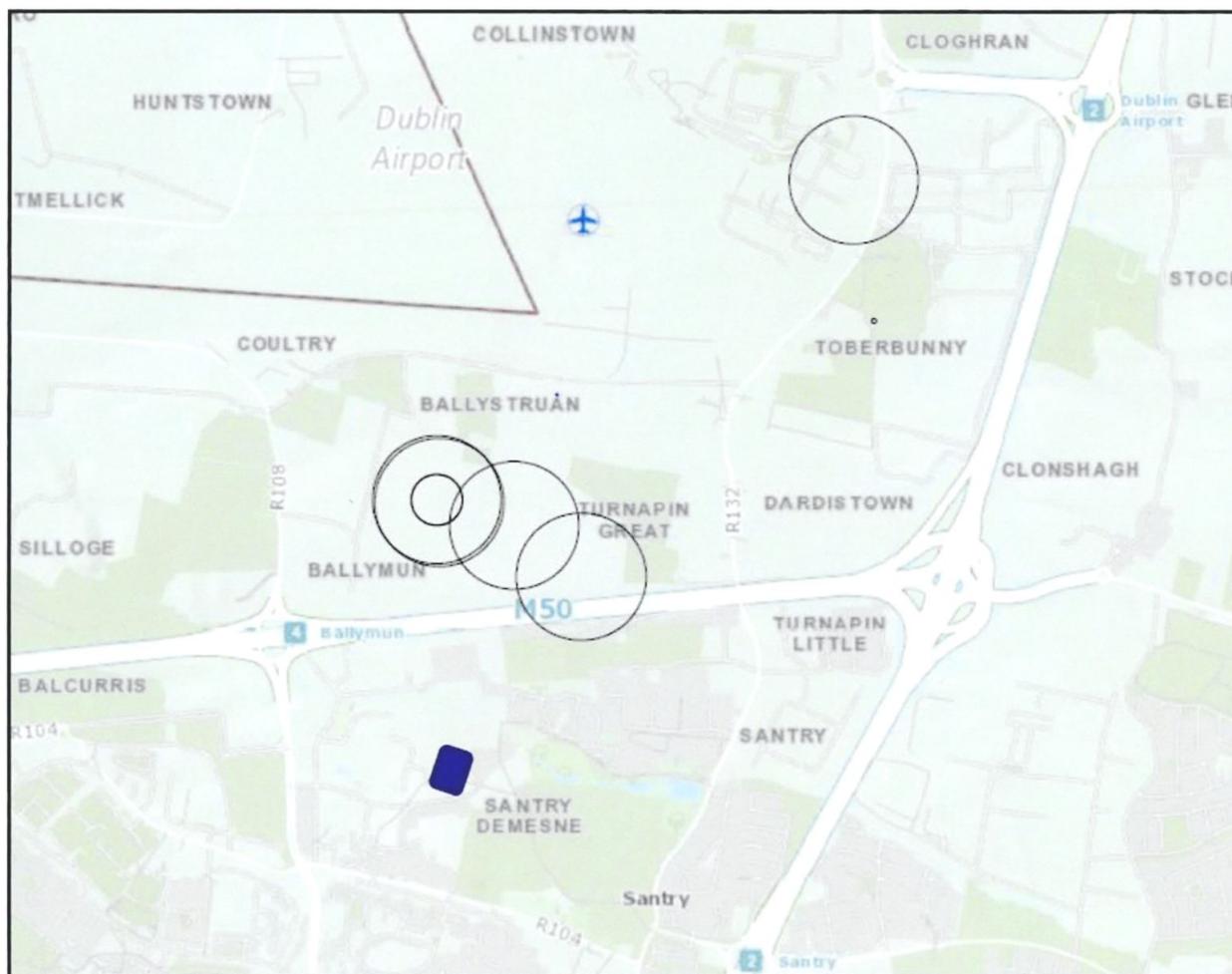


Figure 7-6: Groundwater Wells

Source: GSI web-mapping online viewer www.gsi.ie

7.4 Characteristics of the Project

In summary, the development will consist of the following:

- Site clearance, including the removal of all structures on site part of existing surface car parking;
- Relocation of existing surface car parking spaces catering for Swift Square Office Park personnel to the new basement accessible via a new ramp off the local road from Northwood Avenue, and the new undercroft parking area with access at street level off the local road to the north of the site;
- Construction of 3 no. apartment blocks (1, 2 and 3) over a partially shared podium structure, with heights ranging from 4 to 9 storeys, comprising 192 no. apartment units (4 no. 1-bedroom units and 188 no. 2-bedroom units), ancillary residential uses and associated car and bicycle parking;
- Provision of public and communal open spaces, public realm, boundary treatments, landscaping and lighting; refuse storage, associated drainage, attenuation and services; temporary car parking area and construction access; and all associated site development works.

A full description of the proposed development is set out in **Chapter 5** (Development Description) of Volume 2 of this EIAR.

The following are the aspects of the project that interact with the Land and Soils environment

7.4.1 Earthworks

The development of the project will interact with the land, soils and hydrogeological environments during the earthworks undertaken during the construction stage. Soil will be routinely excavated to a depth of approx.

4.0 metres below ground level to build the underground car park and the site recontoured to accommodate the foundations and construction of the buildings. No dewatering will be required. Sampling undertaken during the site investigation showed no evidence of contaminated soil. The soil samples were classified as inert.

7.4.2 Water Supply

The water needs of the development will be provided by mains water.

7.4.3 Wastewater Disposal

The wastewater generated by the proposed development will be collected and piped to a public sewer.

7.4.4 Drainage

Runoff will be collected in a purpose designed drainage system. The objective of the Fingal Development Plan 2023-2029 requires the use of sustainable drainage systems (SuDS) to minimise and limit the extent of hard surfacing and paving and requires the use of sustainable drainage techniques for new developments to reduce the potential impact of existing and predicted flooding risks. The drainage systems will be designed in accordance with the report entitled "*The Planning System and FRM Guidelines for Planning Authorities*" (2009). Surface drainage will be attenuated to greenfield runoff rates and will make allowance for climate change.

The rainfall runoff collected will be attenuated in a stormwater attenuation system prior to discharge to the surface water system which runs east along Northwood Avenue to the existing attenuation pond at east side of Santry Demense. All runoff from paved areas will pass through a hydrocarbon interceptor. There will be no discharge to ground.

7.5 Impact Assessment

The effects on the Land, Soils and Hydrogeological Environments are assessed in the following sections for the construction and operation of the proposed development.

This assessment of I impacts follows guidelines established by the TII/NRA in its 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (2009)'.

The significance of impacts on specific receptors are considered in terms of the magnitude of the effect/impact of an element of the project on a receptor and the importance of that receptor.

7.5.1 Do Nothing

The 'do nothing' alternative describes the circumstance where no development occurs. There will be no impact on the land, soils, geology and hydrogeology if the 'do nothing' scenario is followed.

7.5.2 Potential Impacts: Construction Phase

There are a number of elements associated with the development which have the potential to impact the land, soils, geological and hydrogeological environment.

7.5.2.1 Excavation and Earthworks, Surplus and Unsuitable Soils

Excavation and removal of subsoils (to an approximate depth of 4.0 metres) will be required to accommodate the construction of the underground car park, the foundations of the buildings and levelling of the site. The excavation will be in boulder clay, and there will be no rock excavation required.

No soft or organic material considered not suitable as a bearing stratum for foundations is anticipated or was encountered in the Site Investigations or in the excavations for the Phase 1 (Bridgefield) and Phase 2 (Blackwood Square) basement car parks.

The soil underlying the site was subject to the Rilta suite of analyses for assessing sample contaminants waste acceptance criteria (WAC). There is no evidence of soil contamination. The WAC analyses classify the soil as inert and can be disposed of in an appropriately licenced facility.

The removal of waste from the site will be carried out in accordance with Waste Regulations, Regional Waste Plan and Waste Hierarchy/Circular Economy Principals.

Disposal of waste to waste management facilities is governed by the Landfill Directive Council Directive 1999/31/EC on the landfill of waste, which classifies landfills by waste type:

- Inert
- Non- Hazardous
- Hazardous

There are suitably licenced facilities with available capacity within the Greater Dublin Area.

All excavated soils shall be disposed of in accordance with all relevant legislation, including the Department of the Environment and Local Government (DoELG) (1996 to 2008), Waste Management Acts, the DoELG (1998) Waste Management (Permit) Regulations and the NRA (2008) Guidelines for the Management of Waste from National Road Construction Project. Material to be disposed of will be treated in accordance with the Landfill Directive (2003/33/EC).

All waste shall be removed by waste contractors authorised under the (Waste Management (Collection Permit) Regulations, 2007 and the Waste Management Collection Permit) (Amendment) Regulations, 2008.

Registration as a By-Product

The design of the proposed development does not facilitate the beneficial re-use of suitable excavated material on site. Consequently, the excavated material constitutes a waste and will be recovered and/or disposed off-site at appropriately authorised waste facilities. However, under the Waste Hierarchy principals, the re-use of the excavated soils is preferred to the disposal to landfill.

If the material is removed off-site for re-use as a by-product (and not as a waste), it will be done in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011. Article 27 requires that certain conditions are met and that by-product decisions are made to the EPA via their online notification form. Consequently, once a suitable project can be identified where the uncontaminated soil can be reused (infill for roads, quarry reinstatement etc), it is proposed to register the surplus soil as a by-product with the EPA.

As part of the registration with the EPA, the developer will demonstrate that the excavated soils meet the 4 by-product conditions,

- a. further use of the soil and stone is certain;
- b. the soil and stone can be used directly without any further processing other than normal industrial practice;
- c. the soil and stone is produced as an integral part of a production process; and
- d. further use is lawful in that the soil and stone fulfils all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts.

If EPA accepts the soils as a by-product the soils no longer constitutes a waste.

Imported Fill and Soils

If imported fill material is required, the use of local quarries or locally available material will be prioritised.

Alternatively, fill material (soils stone) from another site that has been registered as a by-product (and not a waste) in accordance with Article 27 of the Waste Directive Regulations. This will conform to the Waste Hierarchy and divert waste from landfill.

The disposal of excavated material is considered to have low importance, and the magnitude of the impact on the environment is predicted to be neutral, temporary, negligible. The significance of the impact is imperceptible.

Accidental spillages could result in soil being contaminated.

7.5.2.2 Groundwater Quality

Potential impacts during the construction phase include the leakage or spillage of construction related materials on site. For example, raw or uncured concrete and grouts, wash down water from exposed aggregate surfaces, cast-in-place concrete from concrete trucks, fuels, lubricants and hydraulic fluids for equipment used on the development site, bitumen and sealants used for waterproofing concrete surfaces can all potentially impact on soils and groundwater during construction stage. However, the vulnerability classification of the underlying aquifer has been classified as “Low”. During construction, aquifer vulnerability may be slightly increased due to a reduction in depth of overburden in areas of excavation which may increase the potential for migration of contaminants (from accidental spills) to the underlying bedrock aquifer. However, due to the thickness and the low permeability of the boulder clay overburden the impact of the reduction in overburden depth on the groundwater quality is predicted to be *negligible* in magnitude and *imperceptible* in significance, *temporary* in duration and *unlikely*.

7.5.2.3 Karst Features

There will be no impact on karst features.

7.5.2.4 Temporary Construction Dewatering and Groundwater Users

No temporary dewatering will be required to construct the underground carpark. Consequently, there will be no alteration of the existing groundwater flow regime and no impact on the available groundwater resource.

7.5.3 Potential Impacts: Operational Phase

There will be no direct discharges to or abstractions from the soil and hydrogeological environment during the operational phase.

7.5.3.1 Economic Geology

The loss of a high proportion of future quarry or pit reserves would be considered a significant impact, However, exploitation of rock reserves it is not considered economically viable for the Northwood site. There would be no measurable change in quarry reserves. Therefore, the impact on quarry reserves is assessed as *negligible* in magnitude and *imperceptible* in significance.

7.5.3.2 Geological Heritage

There are no geological heritage sites within 4 km of the site. The development of the proposed project will have no impact on geological heritage.

7.5.3.3 Reduction in Recharge area.

The proposed development will incorporate approximately 1.48 hectares of impermeable surfaces (roofs, roads and hardstanding areas). This will result in a reduction in recharge to the aquifer. The site is underlain by low permeability overburden, which will severely restrict recharge. When compared to the overall recharge area to the aquifer, which amounts to thousands of hectares, the reduction in recharge area is insignificant. Taking into account the fact that the aquifer is only locally important and that there are very few groundwater users, the overall impact on the groundwater resource due to loss in recharge area will be *imperceptible*.

7.5.3.4 Accidental Spillages – Contamination of Soils and Groundwater

During the operational phase the leakage or spillage of fuels, lubricants and hydraulic fluids for equipment can all potentially impact on soils and groundwater. However, the vulnerability classification of the underlying aquifer has been classified as “Low” and is known to be low permeability boulder clay. The impact on groundwater water quality is predicted to be *negligible* in magnitude and *imperceptible* in significance, *temporary* in duration and *unlikely*.

7.5.3.5 Groundwater-fed ecosystems

There are no groundwater-dependent terrestrial ecosystems (GDTE) within 4 km of the site. There is no hydraulic connection between the surface of the site and any GDTE. The development of the proposed project will have no impact on groundwater fed ecosystems.

7.5.3.6 Radon

The EPA Radon map indicates estimated less than 1% of dwellings will exceed the Reference Level of 200 Bq/m³. This extremely low level indicates that there is no risk from Radon on the proposed site.

7.5.3.7 Land Use

The existing Site is currently used as surface car parking area associated with the Swift Square Park Office buildings and temporary parking facilitating construction workers at Blackwood Square Strategic Housing Development (SHD) (Ref. ABP-306075-19) to the west of the subject Site. Vehicular access is currently connected to a sideroad off the existing Cedarview housing development and vehicles can travel to Northwood Avenue from the existing carpark via Cedarview and the local access road to the west of the Site. The Site is bounded by Swift Square Office Park development to the south, Cedarview to the north, a local access road and Gulliver's Retail Park to the west, and the proposed Whitehaven SHD development site to the south-east.

The adjacent land uses surrounding the development site are a mix of commercial, healthcare and residential (comprising both individual dwellings and larger residential apartment blocks), all of which benefit from access to / from Northwood Avenue.

The remaining area is undeveloped land that is not being used for any particular purpose. The impact of the development on land use development of the site will be *permanent, small positive* in magnitude and *slight* in significance.

7.6 Mitigation Measures

7.6.1 Mitigation Measures: Construction Phase

As no significant impacts were predicted, no specific mitigation measures are proposed. However, in advance of work starting on site the works Contractor will prepare a Construction Environment Management Plan (CEMP) which will include the schedule of any mitigation measures included with this EIAR. The plan will have regard to the guidance contained in the handbook published by Construction Industry Research and Information Association (CIRIA) in the UK, Environmental Good Practice on Site, CIRIA 2005. The CEMP will be a live document and it will go through a number of iterations before works commence and during the works. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures outlined in the EIA Report and any subsequent conditions relevant to the proposed development. The following mitigation measures have been identified in the outline Construction Environmental Management Plan (CEMP), the Construction Management Plan (CMP) and the Construction Waste Management Plan (CWMP), all of which have been prepared by J.B.Barry and Partners Limited for planning stage. These reports include measures for reduction or elimination of pollution and the schedule of mitigation measures in this EIAR:

- Contractor Guidance set out in the Control of Water Pollution from Construction Sites (CIRIA, 2001) shall be adhered to. Good construction management practices will be employed. During the construction stage, all potentially harmful substances (e.g. oils, diesel, herbicides, pesticides, concrete etc.) will be stored in accordance with the manufacturer's guidelines regarding safe and secure buildings/compounds.
- Designated impermeable cement washout areas must be provided;
- All oils and fuels will be stored in bunded tanks with the provision of a storage/retention capacity of 110% of tank storage. Care and attention will be taken during refuelling and maintenance operations.
- Adequate means to absorb or contain any spillages of these chemicals will be available at all times.
- Any soil contaminated from an accidental spillage will be contained and treated appropriately and disposed of in accordance with the Waste Management Act 1996-2012.

A contract specific construction stage CEMP will be prepared by the contractor prior to commencement of the works.

7.6.2 Mitigation Measures: Operational Phase

As there is no operational interaction or impacts on the land, soils and hydrogeological environments, no mitigation is proposed apart from good practice.

7.7 Residual Impacts

The predicted overall residual impact of the proposed development on land, soils, geology and hydrogeology both during construction and operational stage will be neutral. As the impacts are neutral and unlikely to interact with the impacts of other existing or permitted project, there are no cumulative impacts with other projects predicted.

7.8 Cumulative Impact

Based on the following, the impacts are neutral and unlikely to interact with the impacts of other existing or permitted projects:

7.8.1 Sources of pollution

- No contaminated soil has been identified during site investigation works or previous works on the site.
- All foul sewerage will be collected by a new foul water system and discharge to the existing foul sewer network within Northwood.
- There will be no oil based products or fuels stored on-site either during construction or operation stage.
- All rainwater will discharge through a number of SuDS devices including a green roof system, permeable paving, site attenuation tanks, petrol interceptors and the main Santry Demense attenuation pond before discharging to the existing Northwood surface water sewer network. There is no risk, therefore, from contaminated rainwater.

7.8.2 Pathways

- There are no proposed discharges to groundwater.
- All foul water will discharge to the public sewer network and connect to the North Fringe Sewer.
- Surface water will ultimately discharge to the Santry River having passed through several SuDS devices referred to above. SuDS measures are required under Planning Regulations and GDSDS Guidelines and are not therefore considered to be a mitigation measures implemented to address specific potential impacts on qualifying interests or special conservation interests of the European sites in downstream watercourses as a result of surface water run-off or discharges.

There are, therefore, no cumulative impacts predicted, and the proposed development will have no impact on downstream European site or water quality, as levels of potential pollutants will be diluted to background levels.

Furthermore, there is no possibility of the proposed development undermining the conservation objectives of any of the qualifying interests or special conservation interests of the European sites in downstream watercourses as a result of surface water run-off or discharges.

7.9 Residual Impact

The predicted overall residual impact of the proposed development on land, soils, geology and hydrogeology both during the construction and operational stage will be neutral.

The proposed development will have no impact on the downstream European site or water quality as the level of potential pollutants will be diluted to background levels.

7.10 References

- Guidelines on the Information to be contained in Environmental Impact Statements (EPA, 2002);
- Advice Notes on Current Practice in the preparation of Environmental Impact Statements (EPA, 2003);
- Advice Notes for Preparing Environmental Impact Statements (Draft) (EPA, September 2015); and
- Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009).
- Base maps – Ordnance Survey of Ireland;
- Topographical Survey;
- Office of Public Works flood mapping data (www.floodmaps.ie);
- Relevant Eastern Catchment Flood Risk Assessment and Management (CFRAM) Flood Reports;
- Requirements for the Protection of Fisheries Habitat During Construction and Development Works at River Sites: Eastern Regional Fisheries Board (ERFB);
- Dublin City Council (2005) Greater Dublin Strategic Drainage Study (GDSDS): Technical Documents of Regional Drainage Policies. Dublin: Dublin City Council;
- Greater Dublin Regional Code of Practice for Drainage Works: Version Draft 6.0 (Wicklow County Council, South Dublin County Council, Meath County Council, Kildare County Council, Fingal County Council, Dún Laoghaire- Rathdown County Council & Dublin City Council); and
- Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors” (CIRIA 532, 2001);
- The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Department of the Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW));
- Catchments.ie - Water quality data;
- www.GSI.ie - Mapping; and
- Water quality data from the Environmental Protection Agency website (<https://gis.epa.ie/EPAMaps/>)

8 WATER AND HYDROLOGY

8.1 Introduction

Chapter 8 (Water and Hydrology) of this EIAR will address the likely effects on Water, on all natural surface water bodies which may be affected by the construction of the proposed development. Environmental impacts related to water interact with many other topics also.

8.1.1 Author Information

Kieran O'Dwyer is an Associate Director with J. B. Barry responsible for the environmental and hydrogeological and land and soils elements of development projects. He holds a degree in civil engineering from University College Dublin (1981). He has over 38 years' experience in environmental and hydrogeological consultancy (J. B. Barry and Partners (JBB), WYG and K. T. Cullen). He has managed the environmental element of numerous infrastructure projects throughout Ireland (including the Ringsend Wastewater Treatment Plant (WwTP) Upgrade Project and the Associated Regional Biosolids Facility (Land and Soils and Water), The Lesotho Highlands Water Project, the N81 Route Selection Study and Moville Greencastle Sewerage Scheme Planning Application and EIAR). He carried out the hydrology and hydrogeology assessment for the Greater Dublin Drainage EIAR (and oral hearing) and has presented specialist evidence at numerous other oral planning hearings. He has also provided expert witness testimony relating to hydrogeological issues in the High Court and District Court. He has presented technical papers on groundwater to Engineers Ireland and the International Association of Hydrogeologists (IAH) as well as providing workshops on groundwater vulnerability and source protection to various local authorities and the Environmental Protection Agency (EPA).

8.1.2 Scoping

Scoping of the proposal identified the following issues for consideration in the EIA Report:

- What is the current capacity of the local water supply and drainage?
- What is the current surface water regime at the site and environs?
- What are the anticipated waste waters and surface waters from the new buildings during the construction and operational stages?
- How does the subject site relate to Catchment Flood Risk Assessment and Management (CFRAM)?
- What are the anticipated effects on the hydrological/water environment?

8.2 Assessment Methodology

This section of the EIAR was prepared having regard to the following;

Guidelines:

- *Guidelines on the Information to be contained in Environmental Impact Statements* (EPA, 2002);
- *Advice Notes on Current Practice in the preparation of Environmental Impact Statements* (EPA, 2003);
- *Advice Notes for Preparing Environmental Impact Statements* (Draft) (EPA, September 2015); and
- *Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* (NRA, 2009).

Desk-top study:

Information on the hydrology and surface water environment has been obtained from the following sources:

- Base maps – Ordnance Survey of Ireland;
- Topographical Survey;
- Office of Public Works flood mapping data (www.floodmaps.ie);
- Relevant Eastern Catchment Flood Risk Assessment and Management (CFRAM) Flood Reports;

- Requirements for the Protection of Fisheries Habitat During Construction and Development Works at River Sites: Eastern Regional Fisheries Board (ERFB);
- Dublin City Council (2005) Greater Dublin Strategic Drainage Study (GDSDS): Technical Documents of Regional Drainage Policies. Dublin: Dublin City Council;
- Greater Dublin Regional Code of Practice for Drainage Works: Version Draft 6.0 (Wicklow County Council, South Dublin County Council, Meath County Council, Kildare County Council, Fingal County Council, Dún Laoghaire- Rathdown County Council & Dublin City Council); and
- Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors” (CIRIA 532, 2001);
- The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Department of the Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW));
- Catchments.ie - Water quality data;
- www.GSI.ie - Mapping; and
- Water quality data from the Environmental Protection Agency website (<https://gis.epa.ie/EPAMaps/>)

Other relevant Reports consulted as part of this assessment include the following:

- Water Services Report, prepared by JB Barry and Partners Limited.
- Site Specific Flood Risk Assessment Report, prepared by JB Barry and Partners Limited.

The above reports form part of the documentation submitted with the planning package.

8.2.1 Assessment Approach

The aspects of the project that interact with and effect the receiving/existing hydrological environment were examined.

The likely significant effects of the proposed development on hydrology are discussed, and the measures to mitigate adverse impacts are described. Adverse impacts are those that result in a detrimental effect on the current environment, i.e. deterioration in water quality. The effects are assessed in terms of Quality, Significance, Magnitude, Probability, Duration, and Types. This approach considers both the importance of each environmental receptor and the magnitude of the potential environmental impacts arising from the proposed project on that receptor and the significance of the impact.

The baseline hydrological environment was reviewed on the basis of the following attributes:

- **Water Quality** – The Water Framework Directive (WFD) water quality status provides an indication of the importance of the water body and its biological health;
- **Potable Water Supplies from Surface Water Abstractions** – There are no potable water supply abstractions from the surface water bodies near the proposed development.
- **Area Prone to Flooding** – The review of existing datasets to determine if the site is prone to flooding. The OPW records of historical floods and the flood extent maps produced under Fingal East Meath (FEM) Catchment Flood Risk Assessment and Management Study (CFRAMS) and other CFRAMS projects were used to assess whether the Proposed Project sites and pipeline route options are at risk of flooding and whether extensive flooding (historical and/or predicted) occurs immediately upstream or downstream; and
- **Ecologically Important Surface Water Ecosystems** – European sites, such as Special Protection Areas (SPAs) and Special Areas of Conservation (SACs), and nationally designated sites, such as Natural Heritage Areas (NHA) and proposed Natural Heritage Areas (pNHA). These are discussed in more detail in Chapter 6 Biodiversity of Volume 2.

This assessment of impacts follows guidelines established by the TII/NRA in its ‘*Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* (2009)’.

The significance of impacts on specific receptors are considered in terms of the magnitude of the effect/impact of an element of the project on a receptor and the importance of that receptor.

The Criteria for rating the importance of Environmental Attributes are shown in **Table 14.1**.

Table 8.1: Criteria for Rating Importance of Hydrological Site Attributes - (NRA 2009)

Importance	Criteria	Typical Example
Geology		
Extremely High	Attribute has a high quality or value on an international scale	River, wetland or surface water body ecosystem protected by EU legislation e.g. 'European sites' designated under the Habitats Regulations or 'Salmonid waters' designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988
Very High	Attribute has a high quality or value on a regional or national scale	River, wetland or surface water body ecosystem protected by national legislation – NHA status Regionally important potable water source supplying >2500 homes Quality Class A (Biotic Index Q4, Q5) Flood plain protecting more than 50 residential or commercial properties from flooding Nationally important amenity site for wide range of leisure activities
High	Attribute has a high quality or value on a local scale	Salmon fishery Locally important potable water source supplying >1000 homes Quality Class B (Biotic Index Q3-4) Flood plain protecting between 5 and 50 residential or commercial properties from flooding Locally important amenity site for wide range of leisure activities
Medium	Attribute has a medium quality or value on a local scale	Coarse fishery Local potable water source supplying >50 homes Quality Class C (Biotic Index Q3, Q2-3) Flood plain protecting between 1 and 5 residential or commercial properties from flooding
Low	Attribute has a low quality or value on a local scale	Locally important amenity site for small range of leisure activities Local potable water source supplying <50 homes Quality Class D (Biotic Index Q2, Q1) Flood plain protecting 1 residential or commercial property from flooding Amenity site used by small numbers of local people

The magnitude of the effect/impact can be assessed based on the criteria shown in **Table 7.3** and the significance of the impact which is a combination of impact magnitude and attribute importance is shown in **Table 7.4**.

Table 8.2: Estimation of Magnitude of Impact

Magnitude of Impact Criteria	
Large Adverse	Results in loss of attribute and /or quality and integrity of attribute
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity

Table 8.3: Rating of Significant Environmental Impacts

Importance of Attribute	Magnitude of Impact			
	Negligible	Small Adverse	Moderate Adverse	Large Adverse
Extremely High	Imperceptible	Significant	Profound	Profound
Very High	Imperceptible	Significant/ Moderate	Profound/ Significant	Profound
High	Imperceptible	Moderate/ Slight	Significant/ Moderate	Profound/ Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight/ Moderate

8.2.2 Study Area

The study area for this assessment has been defined with reference to the area in which there is potential for environmental impacts as a result of the proposed development. The study area can be defined as follows:

- Surface Water – Santry River and Dublin Bay
- Water Supply – North Fringe Watermain
- Foul Effluent – North Fringe Sewer, Sutton Pumping Station and Ringsend Wastewater Treatment Plant

The extent of the Study Area is shown in **Figure 7-2**.

8.3 Baseline Scenario (Existing Environment)

8.3.1 Site Description

It is proposed to construct a new residential development with associated services, access roads and underground car parking. The site is located at Swift Square, Northwood, Santry, Dublin 9, between the existing Swift Square Office Park buildings on Northwood Avenue to the south and Cedarwood Housing development to the north – see **Figure 8-1**.



Figure 8-1: Proposed Development Site with indicative subject site outlined in red

Source: Google Maps, annotation by J.B. Barry & Partners)

The proposed development can be accessed from the west via Ballymun Road and Northwood Avenue and from the east via Swords Road and Northwood Avenue. The existing site consists primarily of a surface car park for the Swift Square Office Park buildings.

8.3.2 Surface Water Hydrology

The site is located within the upper catchment of the Santry River (**Figure 8-2**).

The Santry River has its origins at Harristown and Dubber, south of St. Margarets. It flows to the west of Dublin Airport and parallel to the main runway. From there, it flows through Silloge, under the M50 Motorway at Ballymun, through Santry Demesne. It then passes under the M1/M50 Motorway at Santry, through Kilmore, Edenmore, Raheny and under the Dublin/Belfast railway line before discharging to Dublin Bay at North Bull Island. The river drains an area of approximately 1400 hectares.

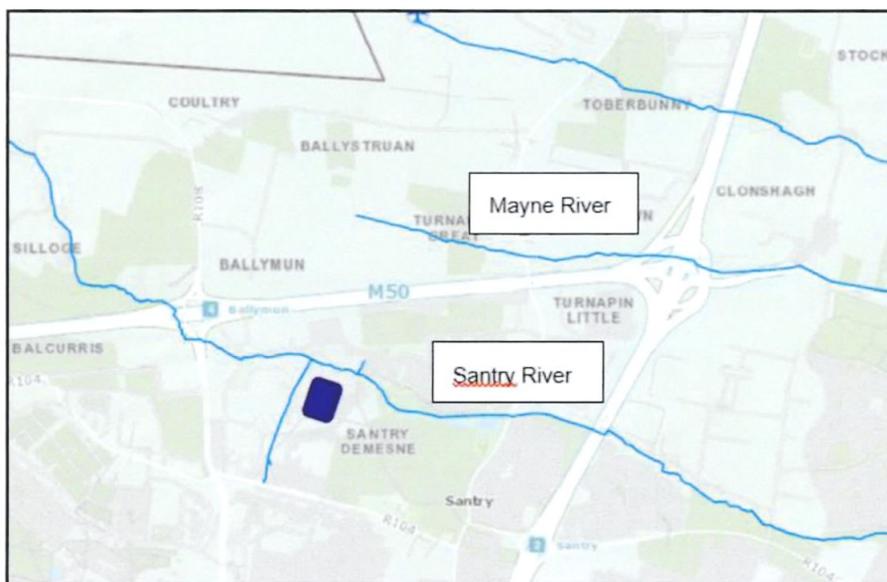


Figure 8-2: Local Rivers

8.3.3 Surface Water Quality

The EPA surveys and assesses approximately one-third of Ireland’s principal rivers and their associated more important tributaries annually, which complies with the WFD Monitoring Programme (EPA 2018b). The results of the most current biological surveys are available as interactive maps on the EPA website (EPA 2018c).

The EPA assessment procedure examines four biological water quality classes, A, B, C and D, where the water quality ranges from the best or ‘unpolluted’ (A) to the worst or ‘seriously polluted’ (D). These classes, and their relationships with the Biotic Index (Q values), are presented in **Table 8.4**. Biotic indices (“Q Values”) reflect average water quality at any location.

Table 8.4: EPA Scheme of Biotic Indices or Quality (Q) Values and its Relationship to Water Quality (EPA 2018d)

Biotic Index 'Q' Value*	WFD Status	Pollution Status	Condition**	Quality Class
Q5, Q4-5	High	Unpolluted	Satisfactory	Class A
Q4	Good	Unpolluted	Satisfactory	Class A
Q3-4	Moderate	Slightly Polluted	Unsatisfactory	Class B
Q3, Q2-3	Poor	Moderately Polluted	Unsatisfactory	Class C
Q2, Q1-2, Q1	Bad	Seriously Polluted	Unsatisfactory	Class D

* These Values are based primarily on the relative proportions of pollution sensitive to tolerant macroinvertebrates (the young stages of insects primarily but also snails, worms, shrimps, etc.) resident at a river site.

** 'Condition' refers to the likelihood of interference or potential beneficial uses.

The WFD came into force in 2000. The WFD was enacted into Irish Law through the European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003) and amendments. The WFD established a framework for the protection of all waterbodies including, rivers, lakes, groundwater, estuarine and coastal waters and their dependent wildlife/habitats. Some key objectives of the WFD are to:

- Protect all waters, including rivers, lakes, groundwater, estuarine and coastal waters;
- Achieve “Good” status in all waters by 2015, and maintain “High” status where the status already exists; and
- Manage water bodies based on the River Basin Districts (catchments).

The EPA mapping tool, catchments website (EPA Catchments 2018), provides data on the current quality and status of the water bodies.

The WFD Status for the Santry_010 River Water Body is “Poor” and “at risk” of not achieving “Good” status.

8.3.4 Flood Risk

In accordance with the guidelines produced by the DEHLG (Department of Environment Heritage and Local Government) “The Planning System and Flood Risk Management: Guidelines for Planning Authorities” (2009) (referred to hereafter as the FRM Guidelines), a Flood Risk Assessment (FRA) has been undertaken for the proposed development. The FRM Guidelines define three Flood Zones (refer to **Error! Reference source not found.** namely:

- **Flood Zone A** – where the probability of flooding from rivers and the sea is highest (greater than 1% AEP or 1 in 100 year for river flooding or 0.5% AEP or 1 in 200 for coastal flooding);
- **Flood Zone B** – where the probability of flooding from rivers and the sea is moderate (between 0.1% AEP or 1 in 1,000 year and 1% AEP or 1 in 100 year for river flooding and between 0.1% AEP or 1 in 1,000 year and 0.5% AEP or 1 in 200 year for coastal flooding); and
- **Flood Zone C** – where the probability of flooding from rivers and the sea is low (less than 0.1% AEP or 1 in 1,000 for both river and coastal flooding).

It is important to note that Flood Zone C covers all areas which are not in Flood Zones A and B.

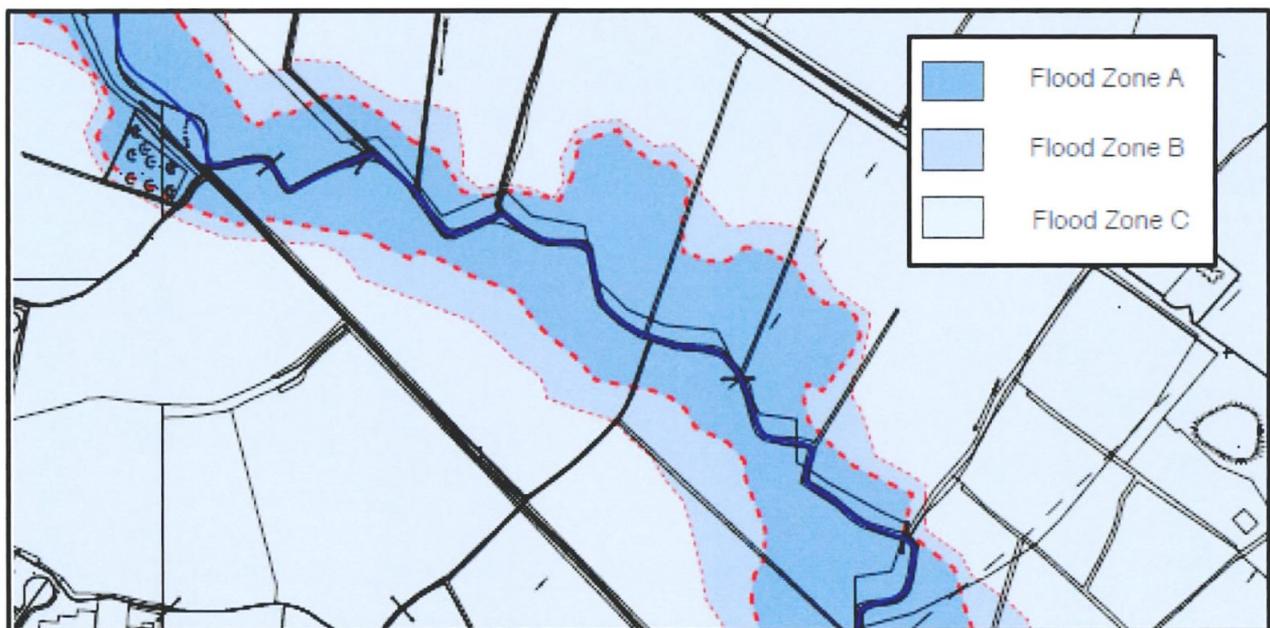


Figure 8-3: Indicative Flood Zone Map

Source: Extract from the FRM Guidelines

The OPW preliminary flood risk assessment (PFRA) flood extent map and FCC strategic flood risk assessment (SFRA) Flood Map indicates that the existing site lies within Flood Zone C. The national flooding website www.floodmaps.ie does not have any record of historic flooding at the site.

The CFRAMS fluvial flood extent maps indicates that the site lies within Flood Zone C, and hence is at low risk of flooding. The map indicates that the 1% AEP and 0.1% AEP fluvial flood levels adjacent to the site are **+51.59mOD** and **+51.70mOD** respectively. Existing ground level on the proposed site ranges between approximately 56.5 and 55.8 mOD and the proposed FFL of all blocks is +56.5mOD.

The site of the proposed development lies outside of the 1% (Flood Zone A) and 0.1% (Flood Zone B) AEP fluvial flood extents and thus is deemed to be in Flood Zone C.

8.4 Characteristics of the Project

This section should be read in conjunction with the site layout plans for the site and project description provided in Chapter 5 of this EIAR.

In summary, the proposed development will consist of the following:

- Site clearance, including the removal of all structures on site part of existing surface car parking;
- Relocation of existing surface car parking spaces catering for Swift Square Office Park personnel to the new basement accessible via a new ramp off the local road from Northwood Avenue, and the new undercroft parking area with access at street level off the local road to the north of the site;
- Construction of 3 no. apartment blocks (1, 2 and 3) over a partially shared podium structure, with heights ranging from 4 to 9 storeys, comprising 192 no. apartment units (4 no. 1-bedroom units and 188 no. 2-bedroom units), ancillary residential uses and associated car and bicycle parking;
- Provision of public and communal open spaces, public realm, boundary treatments, landscaping and lighting; refuse storage, associated drainage, attenuation and services; temporary car parking area and construction access; and all associated site development works.

A full description of the proposed development is set out in **Chapter 5** (Development Description) of Volume 2 of this EIAR.

The following are the aspects of the project that interact with the hydrological environment:

8.4.1 Earthworks

The development of the project will interact with the hydrological environments during the earthworks undertaken during the construction stage. Soil will be routinely excavated to a depth of approx. 4.0 metres to build the underground car park and the site recontoured to accommodate the foundations and construction of the buildings.

8.4.2 Water Supply

The water needs of the development will be provided by mains water.

8.4.3 Wastewater Disposal

The wastewater generated by the proposed development will be collected and piped to a public sewer.

8.4.4 Drainage

The proposed development will incorporate the construction of roofs and podium, paved areas, internal roads and carparks, the runoff from which will be collected in a purpose designed drainage system.

The proposed surface water drainage will be designed to incorporate Sustainable Urban Drainage Systems (SUDS) devices, in the form of permeable paving and a Green Roof system over 60% of the apartment roof and central courtyard areas to limit any potential pollutants in runoff prior to discharge to the Santry River. The drainage systems will be designed in accordance with the report entitled "*The Planning System and FRM Guidelines for Planning Authorities*" (2009). Surface drainage will be attenuated to greenfield runoff rates and make allowance for climate change.

The surface water runoff from all hardstanding areas including the roof, podium, private roads, hardstanding's and associated footpaths has the potential of passing through a minimum of two SUDS measures.

Stormwater runoff from the development will drain via the Green Roof and Permeable Paving systems to the existing surface water infrastructure and flow to the existing attenuation tank to the Northwest of the site before discharge to the Santry River. An attenuated runoff from the proposed development will be limited to the discharge rate of 1.1 l/sec for the 100 year critical storm event + 10% for climate change to maintain the existing discharge rate from the site.

All surface water discharge from the proposed site will pass through suitably sized hydrocarbon interceptors.

8.5 Impact Assessment

The effects on the hydrological environment is assessed in the following sections for the construction and operation phases of the proposed development.

This assessment of impacts follows guidelines established by Transport Infrastructure Ireland (TII) in its 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (2009)'.

The significance of impacts on specific receptors are considered in terms of the magnitude of the effect/impact of an element of the project on a receptor and the importance of that receptor.

8.5.1 Do Nothing

The 'do nothing' alternative describes the circumstance where no development occurs. There will be no impact on hydrology if the 'do nothing' scenario is followed.

8.5.2 Potential Impacts: Construction Phase

There are a number of elements associated with the development which have the potential to impact the hydrological environment.

The potential hydrological Impacts include:

- Risk of flooding to the proposed development site;
- Risk of Flooding to surrounding area;
- Impacts on the water quality of nearby watercourses; and
- Impacts on Hydromorphology.

8.5.2.1 Flood Risk to Development Site

As all the works associated with the proposed development will be located in Flood Zone C, there are no predicted impacts in relation to flooding of the proposed development site.

8.5.2.2 Flood Risk to Surrounding Area.

If the runoff from the site is uncontrolled during the construction stage, there is a potential to increase the risk of flooding downstream. The magnitude of the impact is assessed to be "Small Adverse" on an attribute of "Moderate" importance. The significance of this potential impact is "slight", negative in quality and temporary in duration.

8.5.2.3 Water Quality

Potential impacts to water quality in local water courses during the construction stage in the absence of control measures are:

- The main potential impact on the receiving water in the absence of control measures is an increase in sediment concentration in watercourses during the construction phase. Sedimentation is the deposition of fine sediment either within the gravel or directly on the substrate surface of an aquatic system. The site is relatively flat and runoff will be gentle. Much of the sediment will settle on the ground before entering the water channel. Consequently, the magnitude of the impact is assessed to be "Small Adverse" on an attribute of "Medium" importance. The significance of this potential impact is "slight", negative in quality and temporary in duration.
- Chemical pollutants such as hydrocarbons and other chemicals used in the construction process may enter the surface waters in the event of accidental release and have implications for the area, particularly those sources located down-stream of the proposed development. The volumes of hydrocarbons that could potentially spill during the construction phase will be small. Spills will gather on site rather than discharge directly to the water course. The magnitude of the impact is assessed to be "Small Adverse" on an attribute of "Medium" importance. The significance of this potential impact is "Slight", negative in quality and temporary in duration.

- Sanitary waste from inadequate containment and treatment of on-site toilet and washing facilities could lead to contamination of receiving waters. The flatness of the site will restrict rapid runoff to the water course. The magnitude of the impact is assessed to be “Negligible” on an attribute of “Moderate” importance. The significance of this potential impact is “Imperceptible”, negative in quality and temporary in duration.

8.5.2.4 Hydromorphology

Alterations to the shape or route of the receiving water channel are not proposed. No culverting is proposed. There will be no temporary damming of surface water channels during construction. Consequently, there are no hydromorphological impacts predicted.

8.5.3 Potential Impacts: Operational Phase

8.5.3.1 Flood Risk to Development Site

The site lies within Flood Zone C and is not at risk of flooding. It is recommended in the Fingal Strategic Flood Risk Assessment that the FFL of essential infrastructure is located above the 1% AEP fluvial flood level with an allowance for freeboard and climate change. The 1% AEP fluvial flood level at the site location is +51.59mOD and the 0.1% AEP is +51.70mOD. The proposed FFL of all blocks in the development is +56.5mOD, thus ensuring that the FFL is above both the 1% and 0.1% AEP fluvial flood levels at the proposed development site. Consequently the risk of the site flooding is minimal.

8.5.3.2 Flood Risk to Surrounding Area

The development site lies over 4 metres above the 0.1 AEP flood level. The development of the site will not alter the flood plain or the conveyance channel of the Santry River and therefore the hydraulics of the river will not be altered in the vicinity of the development site.

The proposed drainage designs will incorporate SUDS measures (embedded mitigation) to ensure the runoff from the site (including Phase 1 of the development) to the Santry River will not exceed greenfield runoff rates. Consequently, there will be no increase in risk of flooding in the receiving waters.

8.5.3.3 Water Quality

SUDS measures will be incorporated into drainage design – refer to J.B. Barry and Partners Limited [Water Services Report](#) included with the planning package submitted with the application.

Potentially the most serious source of contamination to a water course associated with the development are accidental spillages.

Chemical pollutants such as hydrocarbons and other chemicals may enter the surface waters in the event of accidental release and have implications down-stream of the proposed development. The volumes of hydrocarbons that could potentially spill during the operational phase will be small. Spills will gather on site rather than discharge directly to the water course. The magnitude of the impact is assessed to be “Small Adverse” on an attribute of “Medium” importance. The significance of this potential impact is “Slight”, negative in quality and temporary in duration.

8.5.3.4 Hydromorphology

Alterations to the shape or route of the receiving water channel are not proposed. Consequently, there are no hydromorphological operational impacts predicted.

8.6 Mitigation Measures

8.6.1 Mitigation Measures: Construction Phase

The planning application package includes an Outline Construction Environment Management Plan (CEMP), a draft Construction Management Plan (CMP) and a draft Construction Waste Management Plan (CWMP). In advance of work starting on site the works Contractor will prepare contract specific construction stage CEMP, CMP and CWMP, which will include the schedule of any