Comhairle Contae
Átha Cliath Theas
South Dublin County Council

South Dublin County Council
Development Plan
2016 – 2022

A VISION FOR SOUTH DUBLIN'S FUTURE

Proposed Variation No. 1

Zoning Objective Amendment on Lands at Grangecastle West

Strategic Environmental Assessment (SEA)

Environmental Report

February 2018

Document Stage	Document Version	Prepared by
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Draft Final	2	Ruth Minogue MCIEEM
Draft Final	3	Checked: NC, South Dublin County Council

This report has been prepared by Minogue and Associates with all reasonable skill, care and diligence. Information report herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is prepared for Clifton Scannell Emerson Associates Consulting Engineers on behalf South Dublin County Council and we accept no responsibility to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

Contents

1.0 Introduction

This is the Environmental Report for the Strategic Environmental Assessment (SEA) of the Proposed Variation No. 1 to the South Dublin County Development Plan 2016-2022 (SDCDP 2016-2022).

SEA is a key process that promotes sustainable development and highlights significant environmental issues within the planning regime. The purpose of SEA is to formally and systematically evaluate the likely significant effects of implementing a plan or programme, in this instance Variation No.1. This report identifies the significant environmental effects of the variation on the environment and where significant effects are identified, recommends appropriate mitigation measures to avoid or reduce such effects. SEA is an iterative process and has informed and influenced the preparation of the variation.

This Environmental Report forms part of the SEA of the variation and documents the SEA process. It is the key consultation document in the SEA process and facilitates interested parties to comment on the environmental issues associated with the variation. This Environmental Report forms part of the SEA on the variation and should be read in conjunction with the proposed variation itself.

1.1 Background to the Proposed Variation

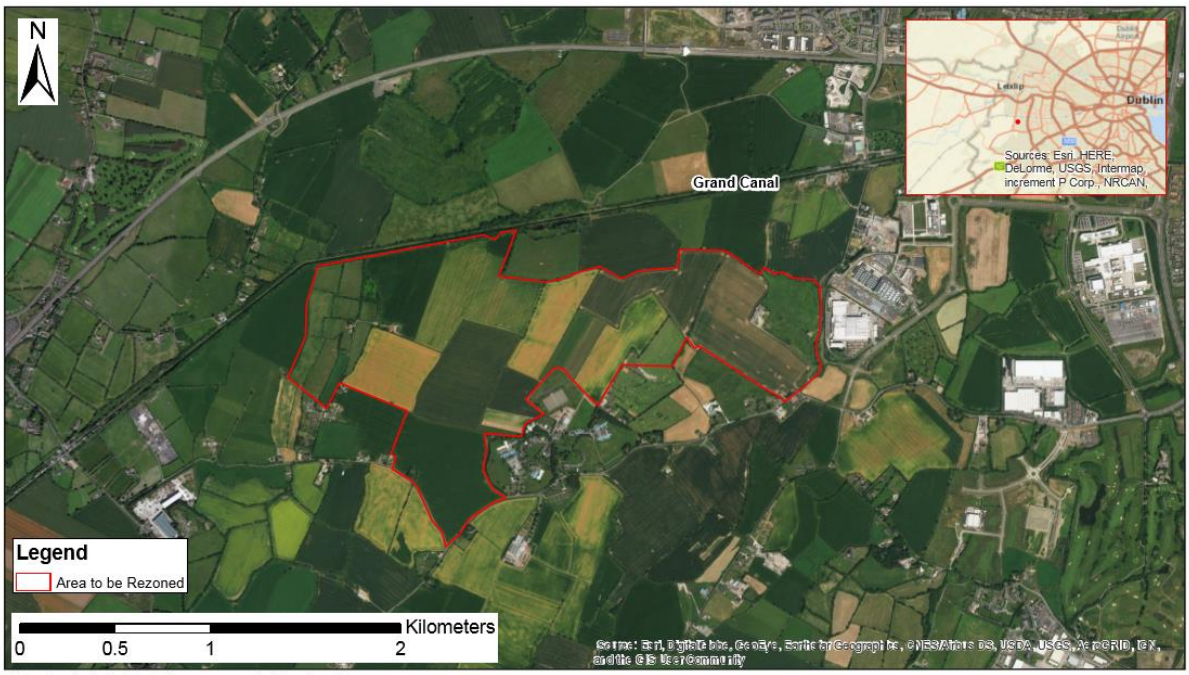
It is proposed to extend Grange Castle Business Park by rezoning an area of 193.47 hectares west of the existing Business Park which is operated by South Dublin County Council in partnership with the Industrial Development Authority (IDA). This proposed rezoning, will form a proposed variation to the existing South Dublin County Development Plan 2016-2022 (SDCDP). This plan came into effect in June 2016 and established the framework for the development over a six year period for the county. The SDCDP was subject to Strategic Environmental Assessment and Habitats Directive Assessment. Within the hierarchy of landuse plans, the proposed variation should be compliant with the policies, objectives of the SDCDP, as well as national and regional plans and guidelines.

A specific local area objective is included in the SDCDP 2016-2022 for these lands, as follows:

ET3 SLO 1: To conduct a review of the zoning of lands south of the Grand Canal and west and north of the R120, including lands adjoining Peamount Healthcare, with a view to preparing a long term plan for the expansion of the Grange Castle Economic and Enterprise Zone to this area, to accommodate strategic investment in the future, while also seeking to

provide public open space along the Canal, including a natural heritage area in the vicinity of the historic canal quarries at Gollierstown.

Figure 1 below shows the lands proposed for the Variation outlined in Red.



Note: Drawing is for illustrative purposes only; Do not scale

1.1.1 Current Zoning

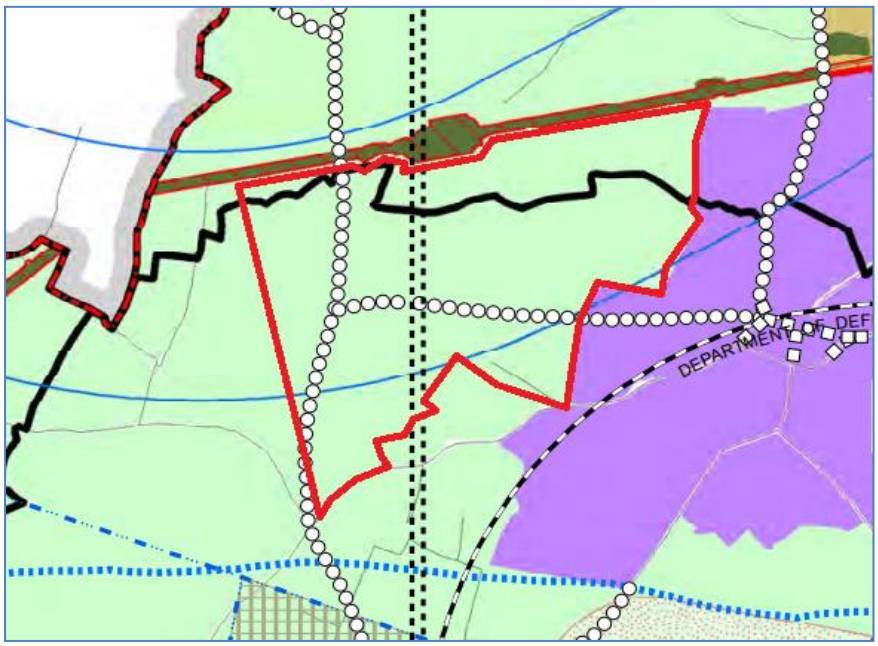


Figure 2.1 Current Zoning in South Dublin County Development Plan 2016-2022

The proposed site is currently zoned RU within the SDCDP 2016-2022 with the objective *'to protect and improve rural amenity and provide for the development of agriculture'*. It is proposed to change this zoning from RU (Rural) to (EE) Enterprise and Employment: '*To Provide for Employment and Enterprise related uses.*'

1.2 Information contained in this Environmental Report

Regulations contained in Schedule 2B of Statutory Instrument (S.I.) 436 of 2004(as amended) details the information to be contained in an Environmental Report. The following Table lists the information required and details where this information is contained in this Environmental Report.

Table 2.1 *Information required to be contained in Environmental Report*

Schedule 2B of Statutory Instrument 436 of 2004	Addressed in this SEA ER
(*a*) *an outline of the contents and main objectives of the plan and relationship with other relevant plans*	Chapter One Introduction and Chapter Two Methodology outlines contents and main objectives; Chapter Three details the relationship with other relevant plans
(*b*) *the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan*;	Chapter Four Baseline Environment provides this information
(*c*) *the environmental characteristics of areas likely to be significantly affected*	Chapter Four Baseline Environment provides this information
(d) any existing environmental problems which are relevant to the plan including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to the Birds Directive or Habitats Directive	Chapter Four Baseline Environment provides this information
(*e*) *the environmental protection objectives, established at international, European Union or national level, which are relevant to the plan and the way those objectives and any environmental considerations have been taken into account during its preparation*	Chapter Five: SEA Objectives provides this information

(*f*) ***the likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors***	Chapter Six, Significant Effects on the Environment provides this information
(*g*) ***the measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan***	Chapter Eight, Mitigation Measures provides this information
(*h*) ***an outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information***	Chapter Seven, Alternatives Considered provides this information and difficulties encountered are listed at the end of Chapter Four, Baseline Environment.
(i) a description of the measures envisaged concerning monitoring of the significant environmental effects of implementation of the plan	Chapter Nine, Monitoring provides this information
(*j*) **a *non-technical summary of the information provided under the above headings***	This is provided as a separate document to this Environmental Report but is also available

1.3 Report preparation

The SEA Team worked closely with the Forward Planning Team and CSA Engineers to prepare the variation. The following consultants prepared this SEA ER:

- Ruth Minogue MCIEEM, (BSoc Sc) Social Anthropology, University of Manchester 1996, MA (Econ) Environment and Development, University of Manchester 1998, Dip Field Ecology, University College Cork 2003, ongoing CPD including certificate in Health Impact Assessment (2012) and Advanced Diploma in Planning and Environmental Law (2017).

- Pat Doherty MCIEEM, MSc in Applied Environmental Science (Ecology), University College Dublin, 2003;BSc (Honours) in Environmental Earth Science, University of Wales, Aberystwyth, 2000; ongoing CDP including Habitat Assessment (NVC) and flora and fauna identification through IEEM.

- Specialist inputs as follows: Cultural Heritage prepared by Courtney Deery Heritage Consultancy; Air Quality, Noise and Climate prepared by AWN Ltd, Water, Soil and Geology by AWN Ltd and Planning Review and Consideration of Alternatives by John Spain Associates.

2.0 METHODOLOGY

2.1 Introduction

This chapter presents the SEA methodology in more detail and outlines the steps required for SEA. The approach to the Appropriate Assessment presented as a separate report is also outlined. The methodology used to carry out the SEA of the variation reflects the requirements of the SEA regulations and available guidance on undertaking SEA in Ireland, including:

- SEA Methodologies for Plans and Programmes in Ireland – Synthesis Report Environmental Protection Agency (EPA), 2003;
- Implementation of SEA Directive (2001/42/EC) Assessment of the Effects of Certain Plans and Programmes on the Environment – Guidelines for Regional Authorities and Planning Authorities - published by the Department of the Environment, Heritage and Local Government, 2004;
- SEA Process Checklist Consultation Draft 2008, EPA 2008;
- Circular Letter PSSP 6/2011 Further Transposition of EU Directive 2001/42/EC on Strategic Environmental Assessment: and
- Guidance on integrating climate change and biodiversity into Strategic Environmental Assessment European Union 2013.
- SEA Resource Manual for Local and Regional Authorities, Draft Version, 2013
- Integrating Climate Change into Strategic Environmental Assessment in Ireland – A Guidance Note,(EPA, 2015), and
- Developing and assessing alternatives in Strategic Environmental Assessment, (EPA, 2015).

The European Union Strategic Environmental Assessment (SEA) Directive (2001/42/EC) requires an environmental assessment be carried out for all plans and programmes that are prepared for certain specified sectors, including land use planning. The following Regulations transpose this Directive into Irish law:

- The European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (S.I. 435 of 2004),
- The Planning and Development (Strategic Environmental Assessment) Regulations 2004 (S.I. 436 of 2004) and further amended by
- S.I. No. 200 of 2011 (European Communities (Environmental Assessment of Certain Plans and Programmes) (Amendment) Regulations 2011) and S.I. No. 201 of 2011

(Planning and Development (Strategic Environmental Assessment) (Amendment) Regulations 2011).

2.2 Stages in the SEA Process

2.2.1 Screening

The SEA Regulations state that SEA is mandatory for certain plans while screening for SEA is required for other plans that fall below the specified thresholds. The proposed variation to the South Dublin County Development Plan 2016-2022 was screened and it was determined that a full SEA is required.

2.2.2 Scoping

In accordance with legislation, separate scoping notification was issued to the prescribed environmental authorities in December 2017 for a four week consultation period from 8th December 2017 to 15th January 2018.

The SEA Screening and Scoping reports (combined) were issued to the following:

- Department of Housing, Planning and Local Government (DHPLG);
- Environmental Protection Agency (EPA)

One response received from the EPA and this is summarised below:

The table below summarises the main issues raised by consultees and the SEA response to same. Please note that pre-draft consultation was also undertaken by SDCC and the list of issues identified through this process also informed the scope of the SEA.

Table 2 Scoping Submissions received.

Consultee	Key Issue Raised	SEA Response
David Galvin, Scientific Officer, SEA Section Office of Evidence and Assessment. Environmental Protection Agency, Regional Inspectorate, Inniscarra, County Cork		
	SEA Determination noted.	
	Any proposed development arising from the Variation should be carried out in a manner that is consistent with the County Core Strategy and with the principles of sustainable development. You should ensure that any development is supported by adequate and appropriate critical infrastructure provision.	Noted, and infrastructure addressed in Chapters 4 and 8.

Consultee	Key Issue Raised	SEA Response
	We acknowledge the attached Scoping Report, in particular, Chapter 3-Key Environmental Resources, along with the commitments to addressing environmental considerations identified such as water quality, flood risk, noise, traffic and transportation, green infrastructure and invasive species.	Noted
	We note Section 3.1.1 Biodiversity, Flora and Fauna of the Scoping Report, which includes a commitment to the retention of ecological corridors and the enhancement of green infrastructure within the lands and surrounding areas. If not already undertaken, there is merit to considering habitat mapping for the Variation lands, in order to strengthen those commitments for retaining/enhancing green infrastructure.	Noted, habitat mapping has been prepared for the lands see Chapter 4 of this SEA ER
	The Scoping Report identifies significant water quality issues relating to the Grand Canal which forms part of the boundary to the Variation lands. The EPA, in collaboration the DHPLG and the Local Authority Waters and Communities Office (LAWCO), has launched a website 'Catchments.ie' which provides detailed information on water quality assessments and trends for catchments, sub-catchments and water bodies nationally. Further in-depth water quality information, based on the characterisation work undertaken as part of the second cycle of River Basin Management planning, is also available via the WFD Application on EDEN (https://wfd.edenireland.ie/). The WFD Application provides a single point of access to catchment data useful for a range of catchment science and management purposes	Noted, water quality described in Chapter 4 in particular.
	Reference to Scoping Process Guidance and EPA State of the Environmental Report 2016	Noted and will be used throughout as appropriate.
	Reference to web GIS reporting tool.	Noted.

2.2.3 Baseline Data

The baseline data assists in describing the current state of the environment, facilitating the identification, evaluation and subsequent monitoring of the effects of the plan. It helps identify existing environmental problems in and around the plan area and in turn these can

be quantified (for certain environmental parameters) or qualified. This highlights the environmental issues relevant to each SEA parameter and ensures that the variation implementation does not exacerbate such problems. Conversely this information can also be used to promote good environmental practices and opportunities through the variation thereby improving environmental quality where possible.

Baseline data has been collected based on the environmental topics described in the SEA Directive i.e. biodiversity, fauna, flora, population, human health, soil, water, air, climate factors, material assets, cultural heritage including architectural and archaeological heritage and landscape.

Additional fieldwork was undertaken with phase 1 habitat surveys and ecological surveys. The Directive requires that information be focused upon relevant aspects of the environmental characteristics of the area likely to be significantly affected by the variation and the likely change, *both positive and negative*, where applicable. With the exception of ecological surveys, the baseline data was gathered from currently available data sources as the SEA Directive does not require major new research to be undertaken.

A Geographical Information System (GIS) was established to spatially analyse this data; to identify areas of particular environmental sensitivity and to help understand how potential land use policies and zonings associated with the variation could impact on the environmental resources of the plan area and at a broader level. The AA also informed this baseline data especially in terms of European Site designations, sensitivities and potential impacts to same.

2.3 Flood Risk Assessment

The Planning System and Flood Risk Management Guidelines (DoEHLG 2009) provide a methodology to incorporate flood risk identification and management into land use strategies. It also requires the alignment and integration of flood risk into the SEA process. The core objectives of the Guidelines are to:

- Avoid inappropriate development in areas at risk of flooding;
- Avoid new developments increasing flood risk elsewhere, including that which may arise from surface water run-off;

- Ensure effective management of residual risks for development permitted in floodplains;
- Avoid unnecessary restriction of national, regional or local economic and social growth;
- Improve the understanding of flood risk among relevant stakeholders; and
- Ensure that the requirements of EU and national law in relation to the natural environment and nature conservation are complied with at all stages of flood risk management.

Potential flood issues in the plan area are an important consideration in the preparation of the new variation. Therefore the variation to the Plan has been guided by the information on flood risk currently available for South Dublin County. Findings and recommendations arising from the SFRA have been integrated into the SEA process.

2.4 Consideration of Alternatives

The examination of alternative options of attaining the strategic objectives of the draft Variation, in the first instance acknowledges the challenges of why the draft Variation choses one course over another. This evaluation of the likely environmental consequences of a range of alternative strategies for accommodating future development in the South Dublin area is part of the SEA process. The three alternatives considered in this SEA are as follows:-

- Scenario 1: Environmental /Preservation Approach (leaving the subject lands in agricultural use)
- Scenario 2 Sustainable/Selective and Sequential Approach (Note: this is the proposed variation)
- Scenario 3 – Weak Planning / Market-led Approach.

Further detail on the alternatives considered and the assessment of same is provided in Chapter Six, Consideration of Alternatives.

2.5 Approach to assessment of significant environmental impacts

The assessment described within this Environmental Report aims to highlight the potential conflicts, if they are present, between the stated policies and objectives contained in the variation to the SDCDP 2016-2022 with the Strategic Environmental Objectives.

Furthermore the assessment examines the potential impact arising from the variation's implementation of its objectives on sensitive environmental receptors.

Key to assessing the policies and objectives of the variation is setting a specific set of environmental objectives for each of the environmental topics. The objectives are provided in Chapter Five and include all aspects of the environment such as Biodiversity, Flora and Fauna, Human Beings, Soil, Water, Air and Climate Change, Noise, Material Assets, Cultural Heritage including Architectural and Archaeological Heritage and Landscape.

The SEA, AA and variation formulation is an iterative process and environmental considerations have informed all stages of the preparation of the variation, in order to avoid or minimise significant adverse environmental impacts. However, the landuse activities associated with Variation No.1 may give rise to residual adverse impacts. Where the environmental assessment identifies significant adverse effects, consideration is given in the first instance to preventing such impacts; where this is not possible for stated reasons, to lessening or offsetting those effects.

In accordance with SEA guidelines the assessment identifies 'impact' under three headings. Firstly the quality of impact is addressed using the following terms:

- Potential Positive impact: A change which improves the quality of the environment.
- Potential Negative impact: A change which reduces or lessens the quality of the environment.
- Uncertain impact: The nature of any impact cannot be ascertained at this stage.

This initial stage aims to ascertain the quality, if any, of the potential impact. Each of the Plan's policies and objectives have been assessed for their impact and where a neutral impact is noted no further discussion is provided within this report. In this manner, the ER focuses on the negative and positive impacts and proceeds to a discussion on their significance and duration. Thus it is a more robust, more focused approach to understanding the potential impacts associated with the variation to the Plan's implementation.

Secondly, where a potential impact is noted, either positive or negative, the significance of impact is addressed. Significance is assessed in terms of the type/scale of development envisaged by the plan and the sensitivity/importance of the receiving environment. This is presented using the following terms:

- Profound: An impact which obliterates sensitive characteristics.
- Moderate: An impact that alters the character of the environment in a manner that is consistent with existing and emerging trends.
- Slight: An impact which causes noticeable changes in the character of the environment without affecting its sensitivities.
- Imperceptible: An impact capable of measurement but without noticeable consequences.

Thirdly the potential duration of identifiable impacts is discussed. The following terms are used:

- Short: Impact lasting one to seven years.
- Medium: Impact lasting seven to fifteen years.
- Long term: Impact lasting fifteen to sixty years.
- Permanent: Impact lasting over sixty years.
- Temporary Impact lasting for one year or less.

Finally where it has been determined that policies/objectives/landuse zonings may potentially result in a negative impact on an environmental receptor appropriate level mitigation measures are proposed.

2.6 Mitigation

Section (g) of Schedule 2B of the SEA Regulations requires information on the mitigation measures that will be put in place to minimise/eliminate any significant adverse impacts due to the implementation of the variation to the SDCDP 2016-2022. Chapter Eight of this SEA ER highlights the mitigation measures that will be put in place to counter identified significant adverse impacts due to the implementation of the variation. As stated previously the formulation of the variation and the development of the SEA is an iterative process and therefore potential negative aspects of the Plan have been removed where possible. Thus the objectives and policies contained within the Variation are considered robust and environmentally sustainable. However some unavoidable residual issues may remain and therefore mitigation measures are required. Chapter Eight details the mitigation measures necessary to prevent, reduce and, as fully as possible, offset any significant adverse impacts on the environment of implementing the variation.

2.7 Monitoring

Article 10 of the SEA Directive sets out the requirement that monitoring is to be carried out of the significant environmental effects of the implementation of the variation to the SDCDP 2016-2022 in order to identify at an early stage any unforeseen adverse effects and to be able to undertake appropriate remedial action. Chapter Nine presents the monitoring requirements for the variation. Methods of monitoring and indicators of change in the environment have been proposed with set targets to be reviewed over the lifetime of the plan; many of these reflect those developed for the SDCDP 2016-2022 as this will facilitate both shared monitoring and consistency of data captured.

2.8 Data Gaps and Technical Difficulties Encountered

Whilst much data in now available for water and ecological resources, data on other issues such as climate change, county level ecological corridors, and human health are only partially available or limited.

3.0 RELATIONSHIP TO PLANS, POLICIES AND PROGRAMMES

3.1 Introduction

Under the SEA Directive, the relationship between the proposed variation and other relevant plans and programmes must be taken into account. A review of the relevant plans and programmes can be found in Appendix A of this Scoping Report.

The preparation of the proposed variation must be considered within the context of a hierarchy of policies, plans and strategies which include international, national, regional and local level policy documents. These documents set the policy framework within which the proposed variation will operate.

The South Dublin County Development Plan 2016-2022 (CDP) was adopted in June 2016. This operates as the primary land use framework for the county and as such, key policies/objectives and environmental protective objectives and policies of the CDP will be applied during plan implementation stage. A list of the key relevant international, national, regional and county policies included in the review are provided below in Sections 3.2 to 3.4; Section 3.5 identifies key principles that will inform the SEA process arising from this review and demonstrate where these principles align with the key actions from the EPA State of the Environment Report 2016.

3.2 International

- UN Convention of Biological Diversity, 1992
- The Convention on Wetlands of International Importance (The Ramsar Convention) 1971 and subsequent amendments
- EU Environmental Action Programme to 2020
- SEA Directive - Assessment of the effects of certain plans and programmes on the Environment, (2001/42/EC) 2001
- Environmental Impact Assessment Directive (85/337/EEC) (97/11/EC), 1985
- EU Biodiversity Strategy to 2020
- EU Directive on the Conservation of Wild Birds, (2009/147/EC) 1979. Known as the Birds Directive
- EU Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna, (92/43/EEC), 1992 known as the Habitats Directive
- European Communities (Birds and Natural Habitats) Regulations 2011
- Green Infrastructure Strategy (EU 2013)

- The Stockholm Convention
- EU Soil Thematic Strategy
- Water Framework Directive (2000/60/EC) as amended
- Floods Directive (2007/60/EC)
- The Drinking Water Directive (DWD), (98/83/EC) 1998
- Groundwater Directive, (2006/118/EC) 2006
- EC Bathing Water Quality Directive, (2006/7/EC) 2006
- Kyoto Protocol
- The Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive
- EU Directive on Waste, (2006/12/EC), 2006
- EU Directive on Waste (2008/98/EC), 2008
- EU Urban Waste Water Treatment Directive (91/271/EEC), 1991
- Directive 2009/28/EC on the promotion of the use of energy from renewable sources
- Paris Climate Change agreement
- The World Heritage Convention
- European Convention on the Protection of the Archaeological Heritage,
- 1992 (The Valletta Convention)
- Convention for the Protection of the Architectural Heritage of Europe, 1985 (Granada Convention)
- The European Landscape Convention 2000
- The Aarhus Convention
- Environmental Liability Directive 2004/35/EC

3.3 National

- Our Sustainable Future A framework for sustainable development in Ireland
- The National Spatial Strategy 2002 -2020
- Ireland 2040: Draft National Planning Framework, 2017
- Actions for Biodiversity 2011 – 2016, Ireland's 2nd National Biodiversity Plan
- Wildlife (Amendment) Act 2000

- National Heritage Plan (2002)
- Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas (Cities, Towns & Villages) (2009)
- Geological Heritage Sites Designation (under the Wildlife Amendment Act 2000)
- River Basin District Management Plan (2nd Plan 2018-2021)
- Water Services Act (2007)
- Water Services (Amendment) Act (2014))
- Irish Water Services Strategic Plan SEA and AA
- Waterways Ireland Heritage Plan 2014-2020
- The Planning System and Flood Risk Management Guidelines (and Technical Appendices) for Planning Authorities (DoEHLG, OPW), 2009
- National Climate Change Strategy (2007-2012)
- Review of Ireland's climate change policy and Climate Action and Low Carbon Bill 2013
- Smarter Travel, A Sustainable Transport Future, A New Transport Policy for Ireland 2009-2020
- National Monuments Act 1930 with subsequent amendments
- Architectural Heritage Protection - Guidelines for Planning Authorities (2011)
- National Inventory of Architectural Heritage (NIAH)
- A National Landscape Strategy for Ireland –2015
- Draft Landscape and Landscape Assessment Guidelines, (2000)
- Planning and Development Act 2000 (as amended).
- Planning Policy Statement, 2015
- Urban Regeneration and Housing Act 2015
- The National Mitigation Plan,
- Draft National Adaptation Framework
- 3rd National Biodiversity Action Plan 2017-2021
- Irish Water's Capital Investment Plan and
- National Clean Air Strategy (to commence)

3.4 Regional and County

- Regional Planning Guidelines 2010-2020- to be replaced by Regional Economic and Spatial Strategies
- Greater Dublin Area Transport Strategy 2016-2035
- South Dublin County Development Plan 2016-2022
- South Dublin County Council Interim Housing Strategy 2016
- South Dublin County Local Economic and Community Plan 2016 -2021
- South Dublin County Heritage Plan 2010-2015

3.5 Key implications and principles arising from the Plan, Policy and Programme Review.

Arising from the review, a number of key principles and implications for the SEA ER can be distilled. It is the intention that these principles will be considered through the SEA process and will serve to inform the assessment. Many of these principles are already included in the Strategic Environmental Objectives developed for the South Dublin County Development Plan 2016-2022 and these will be used in the assessment process where possible.

Table 3.1 Key principles and implications for the SEA of the proposed variation from the plan, policy and programme review.

Principles/Implications	**Links to EPA State of the Environment 2016 Key Action Areas**
SEA Topic	
Biodiversity, Flora and Fauna	
• **Conserve and enhance biodiversity at all levels** • **Avoid and minimise effects on nationally and internationally rare and threatened species and habitats through sensitive design and consultation, recognising ecological connectivity** • **Facilitate species and habitat adaption to climate change** • **Avoid and minimise habitat fragmentation and seek opportunities to improve habitat connectivity**	Nature and Wild Places Restore and Protect Water Quality Implementation of Legislation Climate change

• **Ensure careful consideration of non-native invasive and alien species issues particularly as they relate to waterbodies**	
Population and Human Health	
• **Provide for sustainable communities with key services** • **A high quality environment to live, work and play in** • **Avoid pollution and environmental health impacts through mitigation and design**	Environment, Health and Well-being Sustainable Economic Activities Restore and Protect Water Quality Implementation of Legislation Climate Change
Water	
• **Maintain and improve water quality** • **Avoid and minimise effects on natural processes, particularly natural flood management and catchment processes through sensitive design and consultation** • **Adapt and improve resilience to the effects of climate change, particularly flood risks associated with extreme weather** • **Minimise water consumption/ abstractions** • **Design SUDS to facilitate ecological improvement/ enhancement where possible**	Restore and Protect Water Quality Nature and Wild Places Implementation of Legislation Climate Change
Soil and Geology	
• **Conserve soil resources where possible and avoid waste of soil resources** • **Maintain hydrological integrity of wetlands** • **Maintain productive capacity and prevent erosion of soils** • **Ensure careful consideration of non-native invasive and alien species issues**	Nature and Wild Places Implementation of Legislation
Material Assets	

• **Avoid and minimise waste generation** • **Maximise re-use of material resources and use of recycled materials** • **Minimise energy consumption and encourage use of renewable energy** • **Promote sustainable transport patterns and modes where possible.**	Implementation of Legislation Climate Change
Air Quality and Climate and Noise	
• **Adapt and improve resilience to the effects of climate change** • **Encourage reduction in greenhouse gases through transport, energy, built development.** • **Address Air Quality impacts from transport** • **Minimise and reduce noise impacts**	Implementation of Legislation Climate Change Environment, Health and Well-being
Cultural Heritage	
• **Conserve, preserve and record architectural and archaeological heritage** • **Avoid and minimise effects on historic environment features through sensitive design and consultation**	Environment, Health and Well-being Sustainable Economic Activities Implementation of Legislation
Landscape	
• **Enhance the landscape character of the area through design** • **Integrate green infrastructure considerations** • **Improve landscape connectivity to surrounding area**	Environment, Health and Well-being Sustainable Economic Activities Climate Change
Climate change and sustainability	
• **Adapt and improve resilience to the effects of climate change**	Environment, Health and Well-being

• **Promote local/ sustainable sourcing of materials – Promote sustainable design and innovation to reduce material consumption**	Sustainable Economic Activities Climate Change Implementation of Legislation
Inter-relationships	
• **Maintain and improve the health of people, ecosystems and natural processes** • **Minimise effects on landscape and historic environment features** • **Adapt and improve resilience to climate change and extreme weather events**	Environment, Health and Well-being Sustainable Economic Activities Climate Change Implementation of Legislation Restore and Protect Water Quality Nature and Wild Places

4.0 EXISTING ENVIRONMENTAL BASELINE

4.1 Introduction

This chapter describes the principal environmental parameters that are of relevance to Variation no.1 to the SDCDP 2016-2022. This section includes a description of the relevant aspects of the current state of the environment, the existing environmental problems, environmental characteristics of the areas likely to be significantly affected, and the likely evolution without implementation of the Variation. This section aims to describe the environmental context within which the variation will operate and the constraints and targets that this context imposes on the variation. The purpose of this section is to provide enough environmental baseline data to:

1. Support the identification of environmental problems;

2. Support the process of assessing the environmental effects, and

3. Provide a baseline against which future monitoring data can be compared.

The following sections provide information on the environmental parameters below:

- Biodiversity – Flora and Fauna
- Population and Human Health
- Geology and Soil
- Water – surface, ground, flooding
- Air Quality, Noise and Climatic factors
- Material Assets including transport, waste, waste water and water services
- Cultural Heritage – archaeology and architectural resources
- Landscape
- Interrelationship between these parameters.

Whilst all environmental parameters are described, certain parameters are identified as being of greater significance and may be subject to greater impacts associated with the implementation of the variation. In addition, certain parameters and key elements of same

were identified in draft and scoping submissions of meriting particular scrutiny; therefore the focus on this chapter reflects these comments.

4.2 Biodiversity, Flora and Fauna

The land cover within the Variation Lands is dominated by intensively managed cultivated lands. The principal crops noted within the lands during late September 2017 were gooseberries and broadbeans. At this time crops were harvested and the majority of the area was tilled. The land cover is also characterised by large field-size pattern and much of the field boundaries comprise box-cut hedgerows.

The Grand Canal pNHA runs adjacent to the northern boundary of the site, while one watercourse, the Coldblow/Lucan Stream flows north through the site. This first order stream is a direct tributary of the River Liffey, the confluence point for which is located approximately 4km to the north (and downstream) of the Variation Lands.

4.2.1 Designated Nature Conservation Areas

The lands occurring within the Variation Lands are not subject to any statutory conservation designations. *Table 4.1* lists all designated nature conservation areas occurring within a 15 km radius of the area along with the approximate distances to each of these designated conservation areas. These designated areas are illustrated on *Figure 4.1 to 4.3.* The nearest conservation area to the Variation Lands is the Grand Canal pNHA, which bounds the northern boundary of the Variation Lands. In addition the Coldflow/Lucan Stream which flows north through the Variation Lands and the Griffeen River to the east of the Variation Lands drain into the River Liffey and the Liffey Vally pNHA. A detailed description of the habitats occurring along the section of the Grand Canal pNHA to the north of the Variation Lands is provided below. Detailed information on the Liffey Valley pNHA to the north of the Variation Lands is also outlined below.

Table 4.1: Designated Nature Conservation Areas within 10km of the proposed site

Name and Site Code	Site Code	Designation Type	Distance from Site
Glenasmole Valley	001209	SAC & pNHA	9.5km to the southeast.

Name and Site Code	Site Code	Designation Type	Distance from Site
Red Bog	000397	SAC & pNHA	13km to the south.
Rye Water Valley/Carton	001398	SAC & pNHA	4km to the north.
Wicklow Mountains	002122	SAC & SPA	11.2km to the southeast
Poulaphouca Reservoir	004063	SPA	14.5km to the east
Wicklow Mountains	004040	SPA	11.5km to the southeast
Dodder Valley	000991	pNHA	6.5km to the southwest
Grand Canal	002104	pNHA	Adjoining the site
Kilteel Wood	001394	pNHA	11.5km to the southwest
Dodder Valley			
Liffey Valley	000128	pNHA	2.2km to the north
Lugmore Glen	001212	pNHA	6.5km to the south

Name and Site Code	Site Code	Designation Type	Distance from Site
Royal Canal	002103	pNHA	3.8km to the north
Slade of Saggart & Crocksling Glen	000211	pNHA	6km to the south

Grand Canal pNHA

Detailed surveys of the habitats, flora and fauna of the section of the Grand Canal in the vicinity of the project site were completed during August and September 2015 and between June and September 2016. The 2015 surveys were completed by Roughan & O'Donovan Consulting Engineers (ROD) on behalf of Waterways Ireland and the 2016 surveys were completed by FERS Ltd. on behalf of South Dublin County Council.

The ROD 2015 surveys mapped habitats and recorded the flora and fauna occurring along the Grand Canal during the field surveys. The FERS Ltd. 2016 surveys involved targeted bat and otter surveys along the Grand Canal between the 12th Lock and Hazelhatch.

The ROD 2015 surveys were published in March 2016 (ROD, 2016). A detailed description of the habitats, flora and fauna occurring along the canal between Hazelhatch and Gollierstown Bridge and Gollierstown Bridge and the 12th Lock are provided in the ROD Ecological Assessment Report and are summarised below.

An Ecological Sensitive Area (ESA: noted as ESA 6 in the ROD 2016 report) is located along both sides of the canal between Hazelhatch and the 12th Lock. The ESA is restricted to the northern bankside of the canal along the stretch of the canal bounding the Variation Lands. The ROD 2016 report describes this ESA as follows:

This ESA is identified for the diverse vegetation within the open channel and the rich diversity and zonation on the canal verge. The aquatic diversity includes Sagittaria sagittifolia swamp amongst well developed fringe Nuphar-Potamogeton communities. The Phragmites swamp is also well developed along the canal margins between Aylmers and Golierstown Bridges.

The south canal verge is also diverse with Common Spotted Orchid (Dactylorhiza fuchsii) and many constant species of neutral and dry calcareous grassland abundant. Beyond the south canal boundary there is a mature species-rich hedgerow/woodland including Oak, Ash, Spindle, Sycamore, Willow and Beech. The scrub and woodland mosaic along the north boundary of the canal between Hazelhatch and Aylmer Bridges is also diverse.

Figure 4.1: SACs within a 15km radius of the Variation Lands

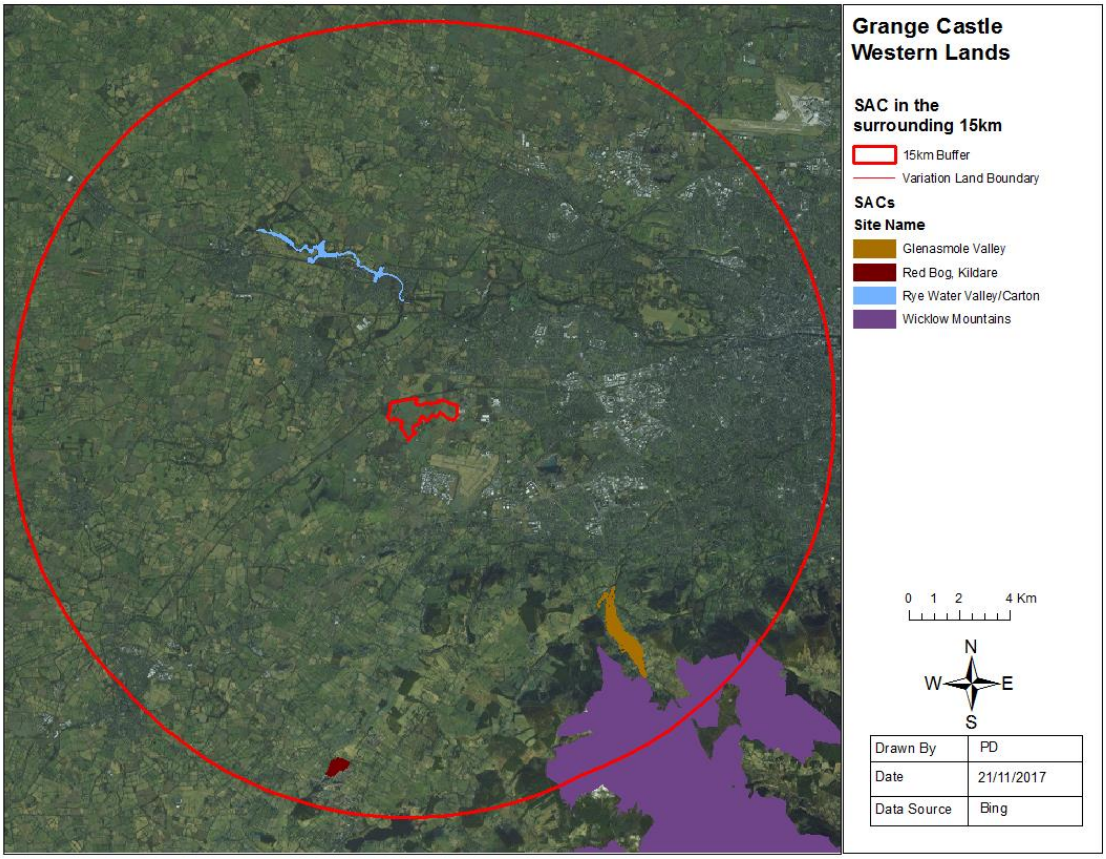


Figure 4.2: SPAs within a 15km radius of the Variation Lands

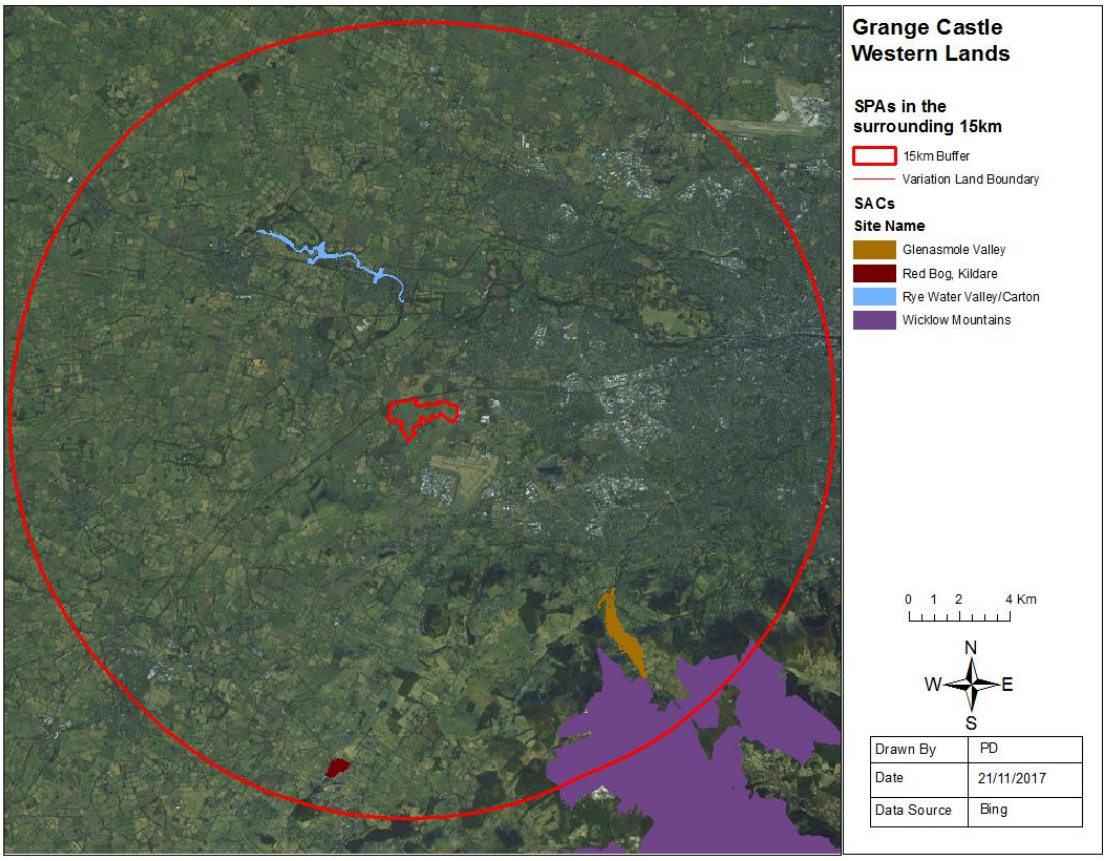
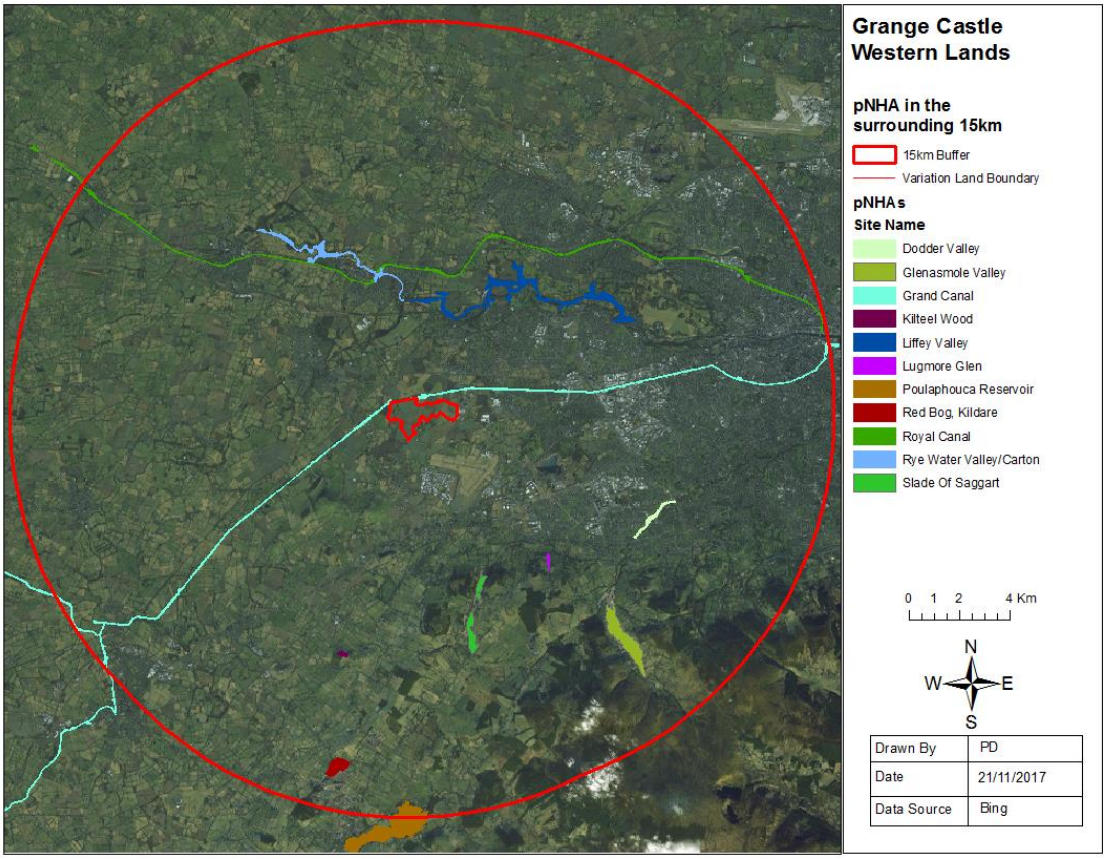


Figure 4.3: pNHAs within a 15km radius of the Variation Lands



The habitats recorded along the section of the canal between Hazelhatch and the 12th Lock are listed in Table 4.2 below.

Table 4.2: Habitats occurring along the Grand Canal pNHA to the north of the Variation Lands

Habitat Code	Habitat Name
FW3	Canals
GS2	Dry meadows and grassy verges
BL3	Buildings and artificial surfaces
BL3	Buildings and artificial surfaces/Amenity Grassland
GA2	Amenity Grassland
WD1/WS1	Broadleaved Woodland (mixed)/Scrub
GA1	Improved agricultural grassland
WD1	Broadleaved Woodland (mixed)
ED3	Recolonising bare ground
WS1	Scrub
WL2	Treeline
FL8	Artificial Ponds
Towpath Mosaic	

The ROD 2016 report described the habitats and flora between Hazelhatch and the 12th Lock as follows:

Between Hazelhatch and Gollierstown Bridge the towpath runs along the northern side of the canal and comprises a gravel surface to the west before changing to a grassy towpath with surrounding habitats including treelines to the north and reed and tall sedge swamp to the south on the canal verge. As the pathway continues along the northern side of the canal eastwards the treeline that borders the site expands into areas of broadleaved woodland (WD1) with patches of Riparian woodland (WN5) present in places on both sides of the canal. The species diversity in this section is relatively low with horsetails, common vetch, nettles and brambles common throughout. Several artificial ponds (FL8) are present just outside the towpath area as the pathway comes closer to Gollierstown Bridge.

Between Gollierstown Bridge and the 12th Lock the canal the towpath continues on the northern side of the canal along this section and is comprised of a grassy pathway with some occasional gravel. The southern side of the canal close to Gollierstown shows some signs of poaching by farm animals that may access the canal from the agricultural fields to the south.

The northern side of the canal is bordered by scrub (WS1) and treeline (WL2) with hemp agrimony and Phragmites australis frequent along the canal verge throughout this section.

The middle section of this stretch is shaded and sheltered by high treeline (WL2) on either side of the canal.

On the approach to the 12th lock the surrounding habitats change and the area becomes more urbanised with commercial units adjacent to the towpath and artificially surfaced areas (BL3) increasing.

The invasive waterweeds Canadian Waterweed (*Elodea canadensis*) and Nuttal's Waterweed (*Elodea nutallii*) were recorded along this section of the canal. No rare or protected flora noted during the 2015 surveys.

A dedicated otter survey of the Grand Canal between the 12th Lock and Hazelhatch was completed between June and September 2016 (FERS, 2016). The surveys found that the entire stretch survey area, with the exception of a 400m buffer zone from Hazelhatch and a 300m buffer zone from the 12th Lock was used by otters. Spraints were regularly recorded along the canal with tracks/trails and slides also ubiquitous along the length of the survey area.

A preliminary walkover survey of the Grand Canal to the north of the Variation Lands was completed in September 2017. Habitats and flora consistent with that noted during the ROD 2015 surveys were recorded during this walkover survey. In addition evidence of otters in the form of spraints, slides and footprints were noted along the canal in the viciniy of the artificial ponds along the southern canal bankside.

In addition to the above the National Biodiversity Data Centre (NBDC) hold records for Desmoulin's Whorl Snail (*Vertigo moulinsiana*) and Narrow-mouthed Whorl Snail (*Vertigo angustior*) on the Grand Canal. Marsh Whorl Snail (Vertigo antivertigo) has also been recorded here, which is another European and Nationally protected species due to its rarity and recent declines in its population numbers. Suitable habitats for these species occur along the section of the canal to the north of the Variation Lands.

Other rare and protected species supported by the Grand Canal include white-clawed crayfish, opposite-leaved pondweed and kingfisher. However the banks of the Grand Canal to the north of the Variation Lands are not suitable as nest sites for kingfisher as they are vegetation and generally low. Lamprey have also been recorded along the 11th level of the Canal (i.e. downstream of the 12th Lock) during Inland Fisheries Ireland (IFI) fish surveys on October 2011. Other fish species recorded along the canal during IFI surveys include roach, bream, tench, rudd, pike, and perch.

Liffey Valley pNHA

The River Liffey is a designated salmonid water and the Liffey Valley pNHA forms part of the Liffey Valley Special Amenity Areas Order 1990. The Liffey Valley pNHA is important because of the diversity of the habitats within the site, ranging from aquatic to terrestrial. A number of rare and threatened plant species have been recorded from the site including the threatened Green Figwort (*Scrophularia umbrosa)*, a species listed in the Irish Red Data Book, which has been recorded from a number of stations along the river within the site. The rare and legally protected Hairy St. John's-Wort (*Hypericum hirsutum)* (Flora Protection Order 2015) has been recorded from woodlands in this site. This species has only been recorded in Kildare and Dublin, at sites on the river Liffey, since 1970. The threatened Yellow Archangel (*Lamiastrum galeobdolon)*, listed in the Irish Red Data Book, is also recorded in the Liffey Valley pNHA woodlands.

4.2.2 Habitats Directive Assessment

Under Article 6(3) & (4) of the EU Habitats Directive and associated national legislation transposing this directive, a Habitats Directive Assessment is required where a plan or project has the potential to result in significant effects to the conservation objectives and integrity of a European Sites.

The Habitats Directive Assessment involves a number of stages. Stage 1 Screening examines the likelihood of a project, either alone or in combination with other projects or plans, to result in significant effects to the conservation objectives and integrity of European Sites. If the Stage 1 Screening concludes that significant effects are likely, a Stage 2 Appropriate Assessment is required. In effect, the Stage 1 Screening assesses the need for a full Stage 2 Appropriate Assessment.

The Stage 2 Appropriate Assessment examines in detail how potential negative impacts associated with a plan or project will affect the integrity of a European Site. Where such effects are considered likely to occur, mitigation measures are proposed so that such impacts are avoided.

A Stage 1 Screening Assessment of the Variation Lands was carried out for the European Sites occurring within its zone of influence. It was concluded that the proposed rezoning will not have the potential to result in likely significant effects to European Sites. As such, a Stage 2 Appropriate Assessment was required not for the proposed variation.

4.2.3 Rare & Protected Fauna

The available landholding spans the four tetrads O03A, O03B, O03F O03G and O03R. A review of protected and rare species records for each of these tetrads held by Biodiversity Ireland (www.biodiversityireland.ie accessed on the 20th November 2017) was undertaken.

The protected, rare and/or sensitive species recorded within the 4 tetrads surrounding the Variation Lands are outlined in *Table 4.3* As virtually all birds are protected in Ireland, only records for amber and red listed species are detailed in this table. A comment on the likelihood of each of these species occurring within the Variation Lands is also provided in the table below. The likelihood of presence is based upon the habitat occurring within the Variation Lands.

Table 4.3: Protected and/or Rare Species occurring in the 4 Tetrads surrounding the Variation Lands

Common Name	Status	Record Date	Likelihood of being supported by the project site
Smooth Newt	Protected Species: Wildlife Acts	2010	Suitable habitat is provided along field boundary hedgerow and drainage ditches and along the Coldflow Stream. Ponds located adjacent to the Grand Canal to the north of the Variation Lands provide suitable habitat for this species also.
Common Frog	Protected Species: EU Habitats Directive >> Annex V || Protected Species: Wildlife Acts	1997 2011	Suitable habitat is provided along field boundary hedgerow and drainage ditches and along the Coldflow Stream. Ponds located adjacent to the Grand Canal to the north of the Variation Lands provide suitable habitat for this species also.
Kestrel	Amber Listed	Bird Atlas 2007 - 2011	Suitable foraging habitat is available for kestrel within and adjacent to the SDZ.
Common Buzzard	Green Listed	Bird Atlas 2007 - 2011	Suitable habitat is provided within the Variation Lands.
Sparrowhawk	Green Listed	Bird Atlas 2007 - 2011	Suitable habitat is provided within the Variation Lands.
Red Kite	Amber Listed	2016	Suitable habitat is provided within the Variation Lands.
Skylark	Amber Listed	Bird Atlas 2007 - 2011	Suitable habitat is provided within the Variation Lands.
Common Swift	Amber Listed	Bird Atlas 2007 - 2011	Suitable habitat is provided within the Variation Lands.

Common Name	Status	Record Date	Likelihood of being supported by the project site
Yellowhammer	Red Listed	Bird Atlas 2007 - 2011	Suitable habitat is provided within the Variation Lands.
Black-headed Gull	Red Listed	Bird Atlas 2007 - 2011	Winter roosting habitat is provided within the Variation Lands.
Grey Wagtail	Red Listed	Bird Atlas 2007 - 2011	Suitable habitat is provided within the Variation Lands.
Golden Plover	Red Listed	Bird Atlas 2007 - 2011	Suitable roosting and winter grazing on stubble is provided within the Variation Lands.
Mistle Thrush	Amber Listed	Bird Atlas 2007 - 2011	Suitable habitat is provided within the Variation Lands.
Kingfisher	Protected Species; Listed on Annex 1 of EU Birds Directive; Amber-listed.	Bird Atlas 2007 - 2011	Suitable roosting and foraging habitat is provided along the Grand Canal to the north. Habitat within the Variation Lands is limited for kingfisher.
Little Egret	Protected Species; Listed on Annex 1 of EU Birds Directive	Bird Atlas 2007 - 2011	Suitable roosting habitat is provided along the Grand Canal. Suitable foraging habitat is provided in artificial ponds in the wider area surrounding the SDZ.
House Martin	Amber Listed	Bird Atlas 2007 - 2011	Suitable habitat is provided within the Variation Lands.
Little Grebe	Amber Listed	Bird Atlas 2007 - 2011	Suitable roosting and foraging habitat is provided along the Grand Canal to the north.
Northern Lapwing	Red Listed	Bird Atlas 2007 - 2011	Suitable roosting habitat is provided along the Grand Canal. Grasslands within the Variation Lands provide suitable foraging habitat for lapwing.
Tufted Duck	Red Listed	Bird Atlas 2007 - 2011	Suitable roosting and foraging habitat is provided along the Grand Canal to the north.
Common Coot	Amber Listed	Bird Atlas 2007 - 2011	Suitable roosting and foraging habitat is provided along the Grand Canal to the north.
Mute Swan	Amber Listed	Bird Atlas 2007 - 2011	Suitable roosting and foraging habitat is provided along the Grand Canal to the north.
Cormorant	Amber Listed	Bird Atlas 2007 - 2011	Suitable roosting and foraging habitat is provided along the Grand Canal to the north.
Herring Gull	Red Listed	Bird Atlas 2007 - 2011	Winter roosting habitat is provided within the Variation Lands.

Common Name	Status	Record Date	Likelihood of being supported by the project site
Lesser Black-backed Gull	Amber Listed	Bird Atlas 2007 - 2011	Winter roosting habitat is provided within the Variation Lands.
Great Black-backed Gull	Amber Listed	Bird Atlas 2007 - 2011	Winter roosting habitat is provided within the Variation Lands.
Linnet	Amber Listed	Bird Atlas 2007 - 2011	Suitable habitat is provided within the SDZ.
Barn Swallow	Amber Listed	Bird Atlas 2007 - 2011	Suitable habitat is provided within the Variation Lands.
House Sparrow	Amber listed	Bird Atlas 2007 - 2011	Suitable habitat is provided within the Variation Lands.
Common Starling	Amber listed	Bird Atlas 2007 - 2011	Suitable habitat is provided within the Variation Lands.
Redshank	Red Listed	Bird Atlas 2007 - 2011	Suitable roosting habitat is provided along the Grand Canal.
Trimmer's Mining Bee	Critically Endangered	1977	No recent record of this species. The last record of this species in the tetrad O03G was from 1977. Preferred nest sites for this species occurs in sparsely vegetated or short cropped areas exposed to sunshine such as south-facing banks and slopes. Such banksides are limited within the Variation Lands. Furthermore there is a limited abundance of food plants within the Variation Lands.
Andrena (Melandrena) nigroaenea	Vulnerable	1977	See appraisal for Trimmer's Mining Bee.
Pisidium hibernicum	Near threatened	2003	Last recorded in 2003 in the tetrad O03G. Likely to be supported by the freshwater habitats adjacent to the Variation Lands such as the Grand Canal.
Pisidium pulchellum	Near Threatened	2003	Last recorded in 2003 in the tetrad O03G. Likely to be supported by the freshwater habitats within and adjacent to the SDZ such as the canal and Griffeen Streams.
Myxas glutinosa	Endangered		Last recorded in 2003 in the tetrad O03R. The Grand Canal is known to support this species.
Chaetarthria seminulum	Threatened	1987	This species is mainly associated with large lake habitats. No record for this species in the wider region was noted in the Red List of Irish Water Beetles (Foster, 2009).

Common Name	Status	Record Date	Likelihood of being supported by the project site
Otter	Protected Species; EU Habitats Directive Annex II	1980 1982	Suitable foraging habitat is provided along the Grand Canal. Limited foraging potential is provided along the ColdFfow Stream flowing through the lands.
Irish Hare	Protected Species: Wildlife Acts	2006	Suitable foraging habitat is provided within and adjacent to the Variation Lands.
Badger	Protected Species: Wildlife Acts	1992 2008	Suitable foraging habitat is provided within and adjacent to the Variation Lands.
Hedgehog	Protected Species: Wildlife Acts	2012	Suitable foraging habitat is provided within and adjacent to the Variation Lands.
Daubenton's Bat	Protected Species; EU Habitats Directive Annex IV	2013 2014	Suitable foraging habitat is provided along the Grand Canal.
Leisler's bat	Protected Species; EU Habitats Directive Annex IV	2002 2009	Suitable foraging habitat is provided within and adjacent to the Variation Lands.
Soprano pipistrelle	Protected Species; EU Habitats Directive Annex IV	2009 2013	Suitable foraging habitat is provided within and adjacent to the Variation Lands.
Common pipistrelle	Protected Species; EU Habitats Directive Annex IV	2002 2009	Suitable foraging habitat is provided within and adjacent to the Variation Lands.
Brown long-eared	Protected Species; EU Habitats Directive Annex IV	2002	Suitable foraging habitat is provided within and adjacent to the Variation Lands.
Pygmy shrew	Protected Species: Wildlife Acts	2012	Suitable foraging habitat is provided within and adjacent to the Variation Lands.
Meadow Barley	Protected: Flora Protection Order; Endangered	1922	No recorded since 1922. Unlikely to occur within the Variation Lands.

4.2.4 Invasive Plant Species

There are no records of invasive plant species occurring within the Variation Lands. Snowberry (*Symphoricarpos albus*) was noted along hedgerow within the Variation Lands. This is an amber listed invasive species.

4.2.5 Habitats

The following sections provide a description of the habitats occurring within and immediately adjacent to the Variation Lands. Figure 4.4 provides a Habitat Map of the Variation Lands. This habitat map and the description of habitats provided below is based on a review of aerial and satellite imagery and a preliminary walkover survey of the Variation Lands in late September 2017. All habitats occurring within and adjacent to the Variation Lands are categorised according to the Heritage Council's *Guide to Habitats in Ireland* (Heritage Council, 2000). The *Guide to Habitats in Ireland* classifies habitats according to a hierarchical framework with Level 1 habitats representing broad habitat groups, Level 2 representing habitat sub-groups and Level 3 representing individual habitat types.

Four Level 1 broad habitat groups were identified within and adjacent to the Variation Lands. These include Freshwater, Grassland, Woodland and Cultivated & Built Land habitats. The level 3 habitat types occurring within each of this habitat groups are described under the following sub-sections.

Freshwater Habitats

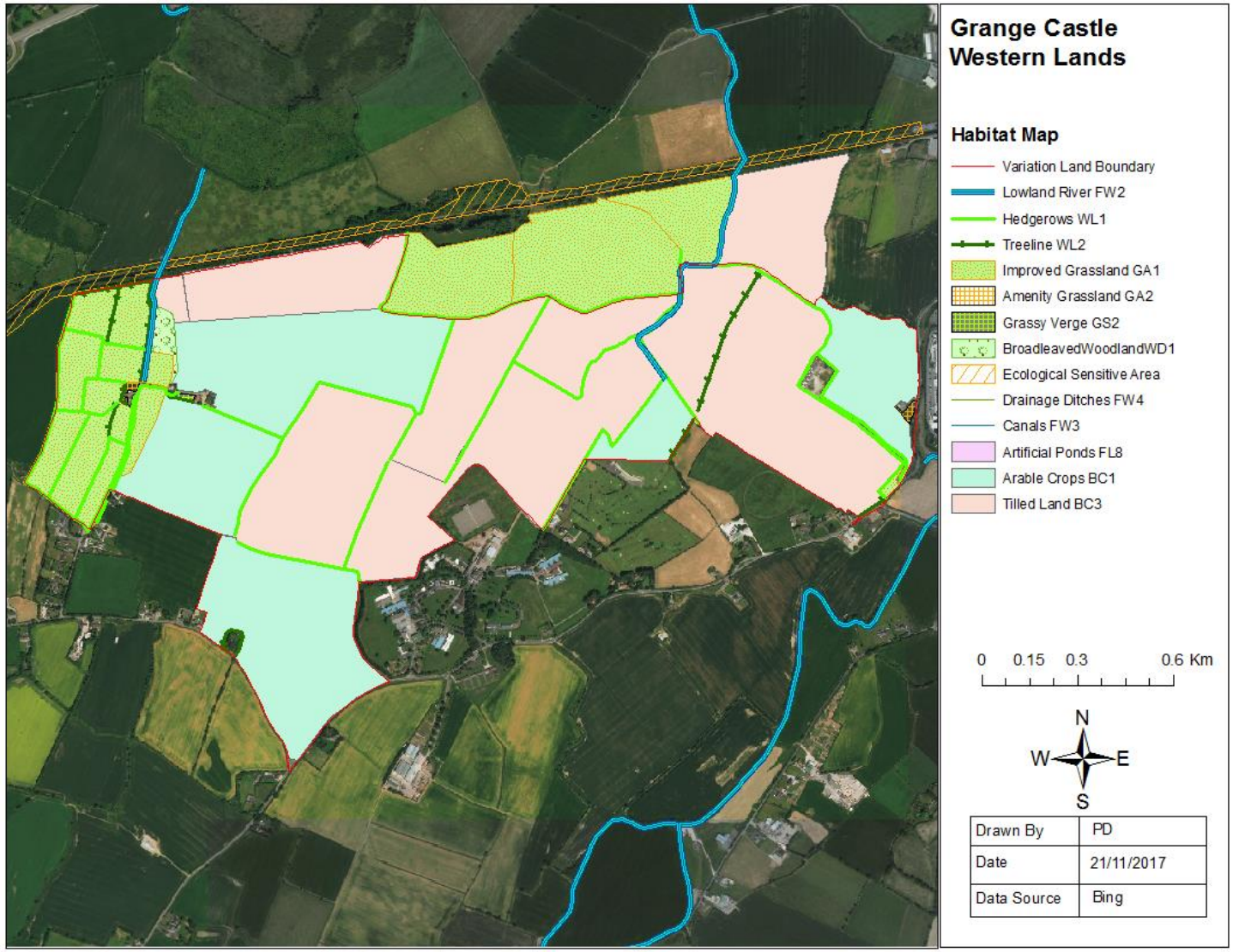
The freshwater habitats occurring within and immediately adjacent to the Variation Lands comprise the Grand Canal, the Coldblow Stream, the Grifeen River to the east and an un-named watercourse flowing through the lands to the west. Drainage ditches, which are ephemeral in nature also occur along field boundaries through the Variation Lands.

A detailed description of the section of the Grand Canal bounding the Variation Lands to the north is provided in Section 4.2.1 above.

The Griffeen Stream flows north to south to the east of the Variation Lands. This is an example of a lowland depositing stream. The IFI surveyed two points along the Griffeen River in 2011 as part of the Water Framework Directive surveillance monitoring programme in rivers. The upstream and downstream sampling points were located at Grange Castle (approximately 600m to the east of the Variation Lands) and Griffeen Avenue (approximately 1.8km to the northeast of the Variation Lands) respectively.

Only one fish species, the three-spined stickleback was recorded in the Griffeen River at the Grange Castle site, while four species (three-spined stickleback, brown trout, roach and eel) were recorded at the Griffeen Avenue site. Based on the results of the 2011 monitoring the fish classification status of the Griffeen River at both sampling sites was classed as moderate. Furthermore the Griffeen system is noted by Inland Fisheries Ireland (IFI) as being exceptional among most urban rivers in that it supports Atlantic salmon and sea trout, in addition to brown trout populations throughout (Tobin Consulting Engineers, 2015). The Griffeen River flows into the River Liffey at Lucan.

Figure 4.4: Habitat Map of Variation Lands



The Coldflow/Lucan Stream flowing north through the site is representative of a minor lowland depositing stream. The upper stretch of this stream within the ariation Lands is choked with abundant macrophytes, dominated by Apium nodiflorum. This watercourse flows into the River Liffey approximately 4km to the north of the Variation Lands.

Drainage ditches occur along the majority of the hedgerow field boundaries within the Variation Lands. However the majority of these are emphemeral/transient freshwater features and are only likely to convey surface water during times of flood. During field surveys these ditches were dry and did not support wetland vegetation.

Grassland

The examples of grassland occurring within the Variation Lands is dominated by improved agricultural grassland (GA1), restricted to the western end of the Variation Lands. This habitat is dominated by grasses throughout, particularly Lolium perenne, with very little herb ocver. *Agrostis stolonif*era is also abundant in examples of this habitat and *Ranunculus repens, Senecio jacobaea* and *Cirsium arvense* are the dominant herbs. This habitat is of low ecological value.

Woodland

A patch of broadleaved woodland occurs to the west of the lands. This woodland consists of *Quercus petraea, Corylus avellana, Acer pseudoplatanus, Fraxinus excelsior* and *Fagus sylvatica*. Open areas of scrub also occur within the woodland. This is the only example of a non-linear woodland habitat within the Variation Lands and as such it is of local importance as a refuge for wildlife and a stepping to the Grand Canal pNHA to the north.

The linear woodland habitats occurring within the Variation Lands consist of field boundary hedgerows and treelines. These habitat are of local nature conservation value and provide connectivity throughout the Variation Lands and to the Grand Canal pNHA to the north.

Cultivated & Built Land

Arable crops (BC1), tilled land (BC3) and buildings and artificial surfaces (BL3) make up the cultivated and built land habitats occurring within the Variation Lands. The arable crop and tilled land habitats support little native flora and are of low ecological

value. The buildings and artificial surfaces habitats within the Variation Lands comprises a vacant farmhouse and farmstead to the west of the Variation Lands. The vacant farmhouse has some potential to function as a bat roost. Otherwise this habitat is also of low ecological value.

4.2.6 Fauna

Birds

A range of commonly occurring passerine species were noted within the Variation Lands during the preliminary walkover survey in late September 2017. Herring gulls were also recorded frequently overflying the area. Other species recorded in the vicinity of the site during Grand Canal surveys (ROD, 2015; Tobins, 2015) include whitethroat, chiffchaff, willow warbler, blackcap, tree sparrow, blue tit, great tit, long-tailed tit, bullfinch, chaffinch, goldfinch, greenfinch, swallow, meadow pipit, robin, skylark, song thrush and starling. In addition three yellowhammers were recorded to the north of the Grand Canal and the Variation Lands in the vicinity of Adamstown (Tobins, 2015).

Non-Volant Mammals

A dedicated otter survey of the Grand Canal between the 12th Lock and Hazelhatch was completed between June and September 2016 (FERS, 2016). This area includes the stretch of the canal to the north of the Variation Lands. The surveys found that the entire stretch survey area, with the exception of a 400m buffer zone from Hazelhatch and a 300m buffer zone from the 12th Lock was used by otters. Spraints were regularly recorded along the canal with tracks/trails and slides also ubiquitous along the length of the survey area.

During the survey the majority of field boundaries within the Variation Lands were walked and a search of badger setts was undertaken along these boundaries. No evidence of badgers or their setts were identified within the Variation Lands during the preliminary walkover survey. During previous surveys in 2016 (FERS, 2016) an active badger sett was identified along the northern bank of the Grand Canal. Significant disturbance to this sett was noted during the later summer of 2016 when evidence indicating attempts to dig out the sett were recorded during surveys.

Bats

Between June and September of 2016, an assessment of the usage of the section of the Grand Canal between Hazelhatch and the 12th Lock was undertaken by FERS Ltd.

During this survey eight bat species were recorded as present along this stretch of the Grand Canal. These species included Common Pipistrelle, Soprano Pipistrelle, Nathusius' Pipistrelle, Leisler's Nat, Brown Long-eared Bat, Daubenton's Bat, Natterer's Bat and Whiskered Bat. Bat activity was found to be highest in areas furthest from light and noise pollution, along the central stretch of the survey area in question. This stretch of the canal corresponds to the western half of the Variation Lands northern boundary. There was a notable decrease in bat usage towards the Adamstown and Hazelhatch ends of the stretch of Grand Canal surveyed. This may indicate that bats utilising this section of the Canal arrive via hedgerow/treeline commuting corridors to the north and south of the Canal as opposed to utilising the Canal itself (there is a large degree of disturbance at the Hazelhatch Bridge end, associated with streetlights, canal barges and the Hazelhatch Public House). This surveys suggest that field boundaries within the Variation Lands may be of importance as commuting routes for bats in the surrounding area. Also due to the predominantly large field pattern within the Variation Lands and the associated low number of linear woodland corridors is it likely that, should any of these linear features function as commuting corridors for bats, then they will be of increased value for bats due to the low number of alternative routes in the area.

Fish & Amphibians

A range of fish species are supported by both the Griffeen River and the Grand Canal. This species are listed in Section 4.3.2 above. Smooth newt and common frog have been recorded in the tetrads within which the Variation Lands occur and suitable habitat for these species occurs along the Coldflow/Lucan River, artificial pond habitats along the Grand Canal and along the Grand Canal itself.

Terrestrial Invertebrates

Terrestrial inverterates recorded in the vicinity of the Variation Lands during recent surveys (ROD, 2016) include a range of odonata species (brown hawker; common hawker; variable damselfly; common blue damselfly; blue-tailed damselfly; large-red damselfly; common darter) and lepidoptera species (oblique carpet; speckled wood;

large white; green-veined white; small white; common blue; small tortoiseshell; meadow brown and painted lady).

Aquatic Invertebrates

As noted in Section 4.3.2 the Grand Canal is known to support a number of protected, rare and threatened aquatic invertebrate species.

4.3 Population and Human health

This section provides information on the current population and employment in the area surrounding the proposed area for rezoning as well as an overview of human health focusing specifically on air quality and noise.

The Variation Lands are located in South Dublin County alongside the border of Kildare County and are characterised primarily by agricultural landscape. There are very few residences located in this proposed development area. The Electoral District (ED) in which the lands are located is the Newcastle ED. The larger of the surrounding South Dublin County EDs which border the Newcastle ED are Rathcoole, Lucan St. Helen's, Clondalkin Dunawley and Clondalkin Village. Two EDs in Kildare County also adjoin the Newcastle ED; Leixlip and Donaghcumper EDs.

4.3.1 Population

2016 census population data for Newcastle ED and adjoining EDs in both South Dublin County and Kildare County are provided the table below.

Table 4.4 2016 Population data for Newcastle ED and adjoining EDs of both South Dublin County and Kildare County.

Council Area or Electoral Division (ED)	Total Population 2016	Total Housing Stock 2016	Total Vacant Houses 2016
South Co Dublin	278,767	98,387	3,495
Newcastle Electoral Division	4,257	1,493	76
Rathcoole E.D.	5,009	1,918	98
Lucan St. Helen's	10,658	3,766	179

Clondalkin Dunawley	11,323	3,889	119
Clondalkin Village	9,152	3,265	126
Kildare County	222,504	80,158	4,560
Leixlip	15,576	5,529	154
Donaghcumper	6,257	2,263	110

The population of South Dublin County overall grew by just slightly more than 5% over the period 2011-2016. The previous census was carried out in 2011. In the Newcastle ED, the population grew by almost 14% in the same period, a considerably higher percentage, albeit off a much lower base figure. Ireland's population as a whole in the same period grew by just under 4%.

Housing stock data for each ED is also provided in Table 4.4.1. Along with population, the housing stock in Newcastle ED is lower than that of surrounding EDs, reflecting the agricultural landscape of the Newcastle ED.

4.3.2 Employment

The numbers of people employed and unemployed are also provided for each ED in Table 4. The Newcastle ED has one of the higher ratios of people at work to those unemployed/looking for work (11:1), while Clondalkin Dunawley has the lowest (4:1). South Dublin County overall has a ratio of 7:1, while Kildare County has a ratio of 8:1. See Table 4.6 below:

Table 4.5 Employment Data for Newcastle ED and adjoining EDs of both South Dublin County and Kildare County. Source: extrapolated Census 2016

	Total at work 2016	**Total Unemployed/looking for work 2016**	**Ratio of people at work to people unemployed/ looking for work**
South Co Dublin	119,290	18,265	7:1
Newcastle ED	1,921	168	11:1
Rathcoole ED	2,319	199	12:1

Lucan St. Helen's ED	4,992	495	10:1
Clondalkin Dunawley ED	4,389	1,147	4:1
Clondalkin Village ED	4,289	538	8:1
Kildare County	95,947	12,297	8:1
Leixlip ED	7,188	710	10:1
Donaghcumper ED	2,999	238	13:1

4.3.3 Human Health

The European Commission's Strategic Environmental Assessment (SEA) Directive (2001/42/EC) indicates that human health should be considered in the context of environmental pathways which may affect health. These pathways would include environmental factors such as air quality, noise, water and soil quality. All can contribute to negative effects on human health by facilitating the transport of contaminants or pollutants. An evaluation of the effects of these pathways on health, by considering the accepted standards of safety in dose, exposure or risk of air quality and noise levels for example, is considered appropriate, as these standards have been arrived at via scientific and medical research . The SEA for the South Dublin County Development Plan states "*The impact of development on human health is also influenced by the extent to which new development is accompanied by appropriate infrastructure and the maintenance of the quality of water, air and soil*."

Census 2016 gathered data on the general health status of the population. The table below provides a summary of the general health status as reported by census respondents in each of the EDs mentioned in 4.3.1.

Table 4.6 General Health Status of the Population in Newcastle ED and surrounding EDs of both South Dublin County and Kildare County. Source: extrapolated from Census 2016

General Health 2016	South Dublin %	Newcastle %	Kildare %	*Rathcoole %*	*Lucan St. Helens %*	*Clondalkin Dunawley %*	Clondalkin Village %
Very good	60%	60%	63%	61%	62%	55%	57%
Good	27%	28%	26.4%	28%	28%	29%	28%
Fair	7.4%	8%	7%	7%	6%	9%	8%
Bad	1.3%	1%	1%	1%	1%	2%	1%
Very bad	0.3%	0%	0.2%	0%	0%	0%	0%
Not stated	4%	3%	2.4%	3%	3%	5%	6%

4.3.4 Human Health and Noise

Environmental noise exposure is a recognised stressor on human health. Stephens and Matheson[1] (2003) stated "*It is generally believed that noise disturbs activities and communication, causing annoyance. In some cases, annoyance may lead to stress responses, then symptoms and possibly illness. Alternatively, noise may influence health directly and not through annoyance. The response to noise may depend on characteristics of the sound, including intensity, frequency, complexity of sound, duration and the meaning of the noise".*

Environmental noise can cause annoyance and also have harmful effects on human health. Some negative effects associated with environmental noise can include increased blood pressure, sleep disturbance, psychological symptoms, reading impairment as well as a negative impact on long term memory[1]. Information on noise levels in the area of the proposed rezoned lands is provided in Section 4.6.

[1] Stansfeld, S., Matheson M.P. (2003) Noise pollution: non-auditory effects on health. *British Medical Bulletin*, (68) 1: (1 December 2003);243–257 [Online] Available from https://doi.org/10.1093/bmb/ldg033 [Accessed 4th November 2017]

4.3.5 Human Health and Air Quality

Where air pollution is occurring, it has been associated with a variety of negative effects on human health from increased respiratory symptoms, hospitalisation for heart and/or lung disease and premature death. Cancer and birth defects have also been associated with toxic air pollutants[2]. Information on air quality in the area of the proposed rezoned lands is provided in Section 4.6.

4.3.6 Human Health and Water

Water is a basic requirement for human life. Poor water quality can have a wide variety of negative impacts on public health ranging from diarrhoea to cancer depending on the potential contaminants present. The Drinking Water Regulations (S.I. No. 122 of 2014) specify the standards for drinking water in Ireland[3]. Standards for water quality of rivers and lakes are specified in the Surface Water Regulations (E. C. Environmental Objectives (Surface Waters) Regulations 2009 - S.I. No. 272 of 2009, as amended 2012, 2015) and standards for groundwater are provided in the Groundwater Regulations (E.C. Environmental Objectives (Groundwater) Regulations 2010 – S.I. No. 9 of 2010, as amended 2016). Section 4.6 provides further detail on water resources and quality in the vicinity of the lands proposed for rezoning.

Appropriate treatment of wastewater is required to ensure there is no contamination of the receiving water body and to preserve the quality of drinking water supply. The South Dublin County Development Plan (2016-2022) states that lack of capacity for wastewater treatment is a significant issue with the Ringsend wastewater treatment plant (WWTP) currently close to capacity. Irish Water have planned for an upgrade to this WWTP.

[2] U.S. EPA (2016) MANAGING AIR QUALITY - HUMAN HEALTH, ENVIRONMENTAL AND ECONOMIC ASSESSMENTS [ONLINE] AVAILABLE AT HTTPS://WWW.EPA.GOV/AIR-QUALITY-MANAGEMENT-PROCESS/MANAGING-AIR-QUALITY-HUMAN-HEALTH-ENVIRONMENTAL-AND-ECONOMIC [ACCESSED 4TH NOVEMBER 2017]

[3]EPA (2014) Microbiological, Chemical and Indicator Parameters in the 2014 Drinking Water Regulations - An overview of parameters and their importance. [Online] Available from http://www.epa.ie/pubs/advice/drinkingwater/2015_04_21_ParametersStandaloneDoc.pdf. [Accessed 5th November 2017]

4.3.7 Human Health and Radon

The Irish Environmental Protection Agency (EPA) state that the greatest health risk from radiation in Ireland is caused by radon. More than half of the total radiation dose received by the Irish population is accounted for by radon. It is a known cause of lung cancer. Where radon is the cause of lung cancer, it is primarily associated with exposure to radon in the home. However exposure in the workplace is also a contributor and the employer must protect the health of workers from this identifiable risk[4].

A High Radon Area is any area where it is predicted that 10 per cent or more of homes will exceed the Reference Level of 200 bequerel per cubic metre (Bq/m^3). The proposed area of land for rezoning resides in a 10km grid square classified by the EPA as one where between five and ten per cent of the homes are estimated to be above the Reference Level for radon. Therefore the proposed rezoned lands would not be considered to be located in an area at risk of high radon.

4.3.8 Amenity

Agriculture is the primary use of the lands proposed for rezoning as can be seen in the Figure below:

Note: Drawing is for illustrative purposes only; Do not scale

Figure 4.5 Agriculture is the primary land use of area proposed for rezoning

[4] Irish EPA [Online] Available at http://www.epa.ie/radiation/radon/ [Accessed 4th November 2017]

Peamont Hospital is located immediately adjacent to the southernmost point of the site. The hospital provides a variety of services including respite care, primary care and diagnostic services and rehabilitation services.

The site lies between the M4 motorway which connects Sligo to Dublin and the M7 motorway which connects Dublin to Limerick. To the east of the site is the Grangecastle Business Park, a 500 acre IDA business Park. The Outer Ring Road (R36) connects the M7 and M4 motorways and serves the nearby Grangecastle Business Park, which is a 500 acre IDA industrial park. The lands proposed for rezoning lie adjacent to the Grangecastle Business Park.

To the north of the site is the Dublin Kildare Commuter train line. Currently Adamstown is the closest train station to the proposed lands.

A section of the northern boundary of the lands borders the Grand Canal. The Grand Canal runs from Dublin Grand Canal Dock to Shannon Harbour in Co. Offaly. Tourists hire barges to boat along the canal way and boat owners also use the Canal for pleasure trips. The Grand Canal Way is a hiking trail which runs along both sides of the Grand Canal and is identified on Irish Trails.ie as a National Way Marked Trail. People use this trail for walking and cycling. The Grand Canal Way follows towpaths, gravel and sometimes tarmac canal-side roads from Lucan Bridge near Adamstown in County Dublin 124km to Shannon Harbour in Co. Offaly (Figure 4.6 below).

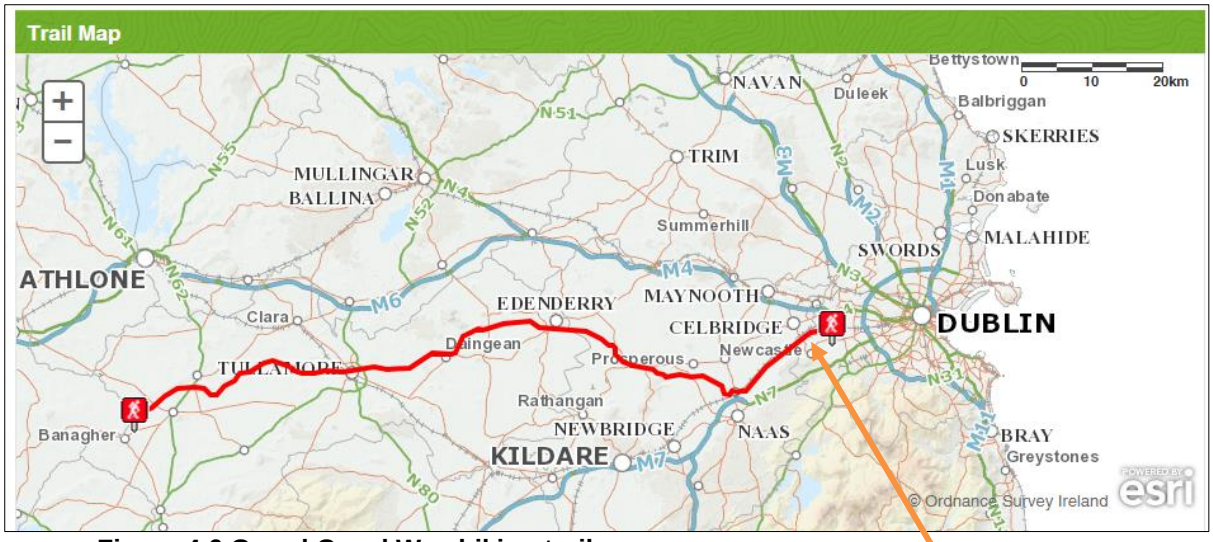


Figure 4.6 Grand Canal Way hiking trail

(source: http://www.irishtrails.ie/trail/Grand-Canal-Way/18/

Grangecastle West Location of proposed rezoned lands.

4.3.9 Existing Environmental Issues

Given the predominant agricultural landuse and the relatively low population and housing on the subject lands, in terms of existing environmental issues as they relate to population and human health, none are currently identified.

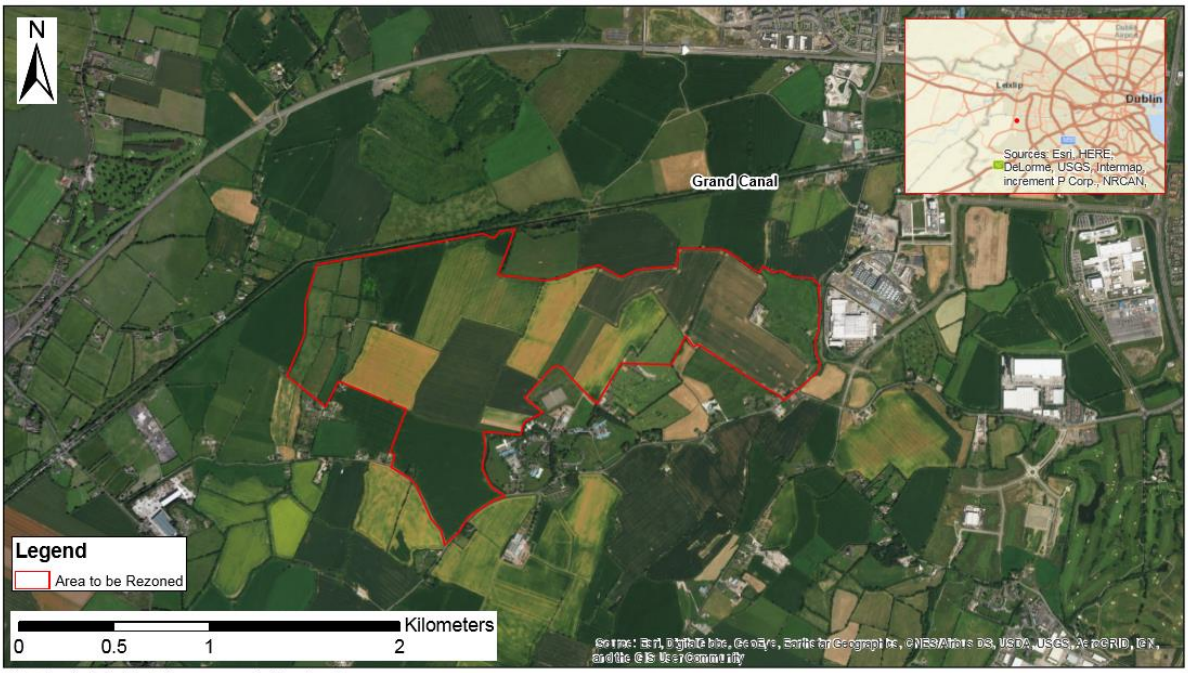
4.4 Land, Soils & Geology

This section describes the existing environmental baselines in terms of land, soils and geology. The principal attributes described include the following:

- Geological heritage sites in the vicinity of the perimeter of the subject site;
- Landfills, industrial sites in the vicinity of the site and the potential risk of encountering contaminated ground;
- The quality and range of agricultural and forestry uses of soil around the site;
- Quarries or mines in the vicinity, the potential implications (if any) for existing activities and extractable reserves;
- The extent of topsoil and subsoil cover and the potential use of this material
- Nature of the Geology

4.4.1 Land use

The Variation Lands are located on a large portion of partially underdeveloped lands located between the Grange Castle Business Park and the Newcastle Road (R120), Clondalkin, Dublin 22. The land is a mixture of agricultural (currently mainly used as pasture land predominantly for livestock grazing to the west of the R120 and to the north of the canal), and residential. According to the EPA on-line database, there are a number of licensed IPPC facilities in the locality (Takeda Pharma Ltd and Pfizer Biotech) and there are no licensed waste sites in the vicinity. Consultation with South Dublin County Council confirmed that there are no known illegal/historic landfills within 500 metres of the lands. A number of residential properties bound the site to the south and south-west.

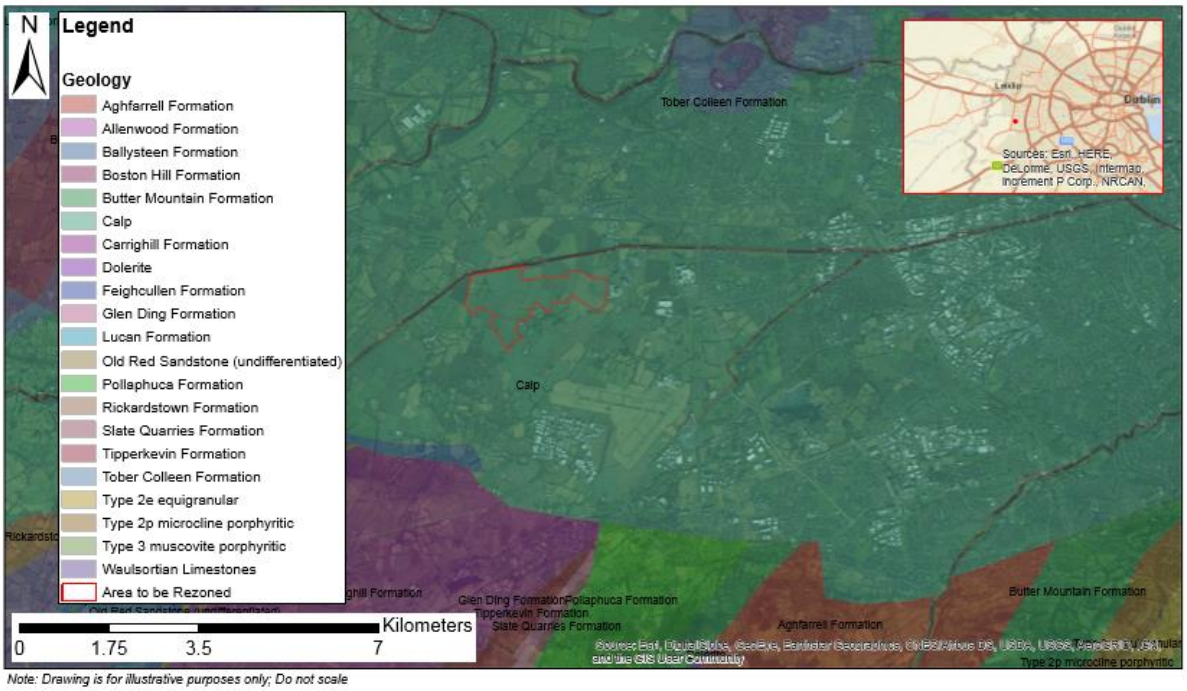


Note: Drawing is for illustrative purposes only; Do not scale

Insert 4. 1 presents the Variation Lands and current land use

4.4.2 Bedrock geology

Inspections of available Geological Survey of Ireland (GSI) data show that the bedrock geology underlying the site and surrounding area is dominated by rocks of Carboniferous Age. The site and local area is underlain by Dinantian (Upper Impure) Limestones or 'Calp' limestone that is dark grey to black limestone and shale, see Insert 4.2 below.



Note: Drawing is for illustrative purposes only; Do not scale

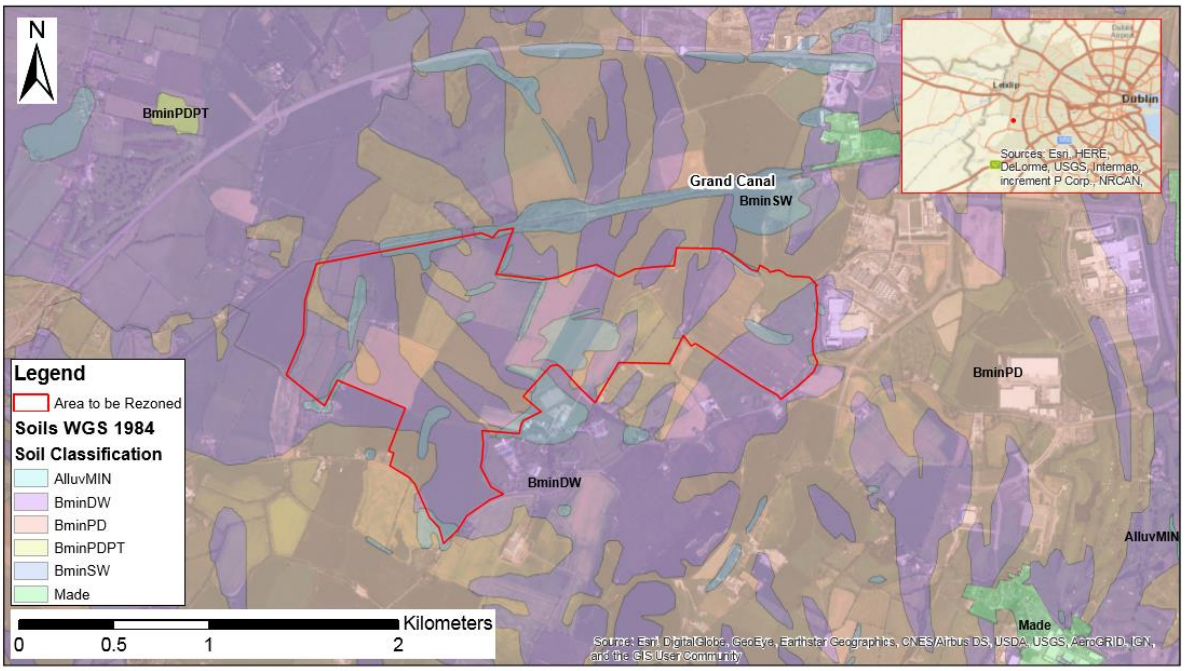
Insert 4. 2 presents the Variation Lands and bedrock geology of the area.

The depth to bedrock throughout the lands is generally shallow ranging from 0 to 5 metres below ground level (source: GSI groundwater vulnerability map).

The GSI database presently lists no karst features in the immediate vicinity of the lands and significant karstification would not be expected in this type of limestone.

4.4.3 Soil and subsoil

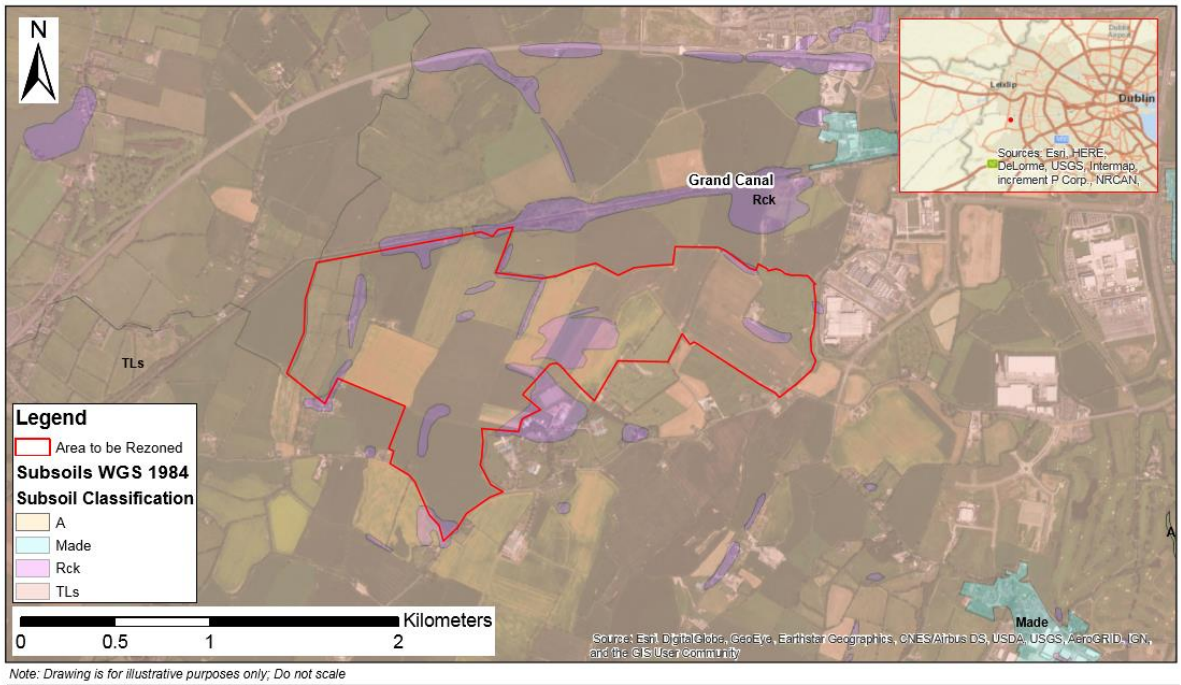
Although considered a non-renewable resource due to the length of time it takes to generate soil, there is no specific legislation which protects soil in Ireland. The 7th Environment Action Programme (EAP) recognises the challenge of soil degradation and provided by 2020 that land be managed sustainably with soil adequately protected. The soil type at this locality (Insert 4.3) predominantly comprises BminPD - Surface water Gleys / Ground water Gleys Basic and BMinDW soils-Grey Brown Podzolics/Brown earths basics.



Note: Drawing is for illustrative purposes only; Do not scale

Insert 4.3 presents the Variation Lands and soil type

The overburden geology (Insert 4.4) comprises Quaternary Glacial Till (TLs) which is derived from limestone and is a common soil cover in this region.



Note: Drawing is for illustrative purposes only; Do not scale

Insert 4.4 presents the Variation Lands and subsoil and overburden geology.

4.4.4 Geological heritage and Areas of conservation

The lands within the proposed rezoning area have no formal designations for conservation. The nearest designated site is the Grand Canal pNHA (Site Code: 002104) which is c.50m to the east of the overall site. The Geological Heritage of South Dublin County Audit[5] identifies Belgard Quarry as the closest geological heritage site east of the lands, a distance of some 4km south east; whilst the geological site of Newcastle Buried Channel is located some 7km southwest of the subject lands.

Economic geology

The Extractive Industry Register (www.epa.ie) and the GSI mineral database was consulted to determine whether there were any mineral sites close to the proposed rezoning area. There are no active quarries located within the proposed rezoning boundary. The nearest active quarry, Belgard Quarry, is located approximately 4km to the southeast.

Geo-hazards

According to the GSI web database, there are presently no records of geo-hazards such as landslides within a radius of 10km of the site.

Rating of importance of geological and soil attributes

Based on the NRA methodology (2009), criteria for rating site importance of geological features, the importance of the bedrock and soil features at this site is rated as *Low Importance with low quality significance or value on a local scale*. There are no extractable minerals or areas of geological heritage and the soils are suitable for agricultural use and are typical of surrounding agricultural land.

4.4.5 Relevant Environmental Issues

The primary issues for land, soils and geology are considered to be:

- Retention of open greenfield areas for open space and supporting biodiversity
- Retention of adequate good agricultural land in the overall region and maintaining soil quality and function

[5] Geological Survey of Ireland, 2014

- Sustainable management and use of soil and bedrock during redevelopment processes, including sustainable management of any brownfield sites or contaminated soil encountered during redevelopment.

4.5 Water resources including Flooding

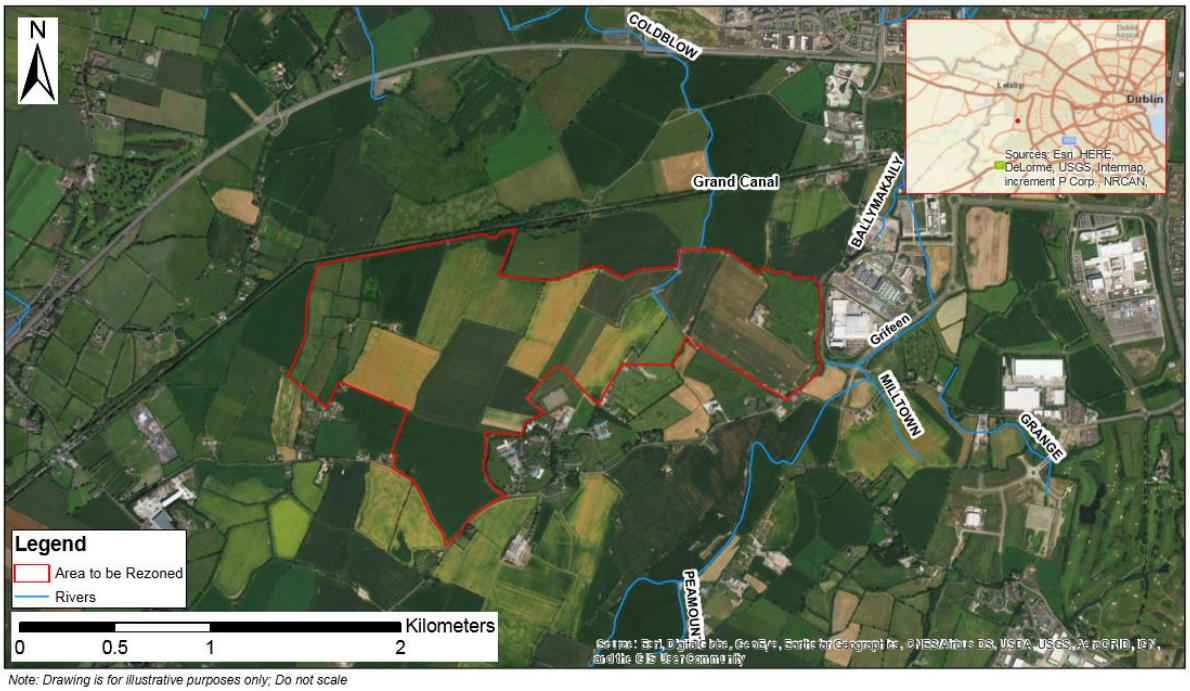
This section describes the existing water resource relevant the lands that form part of the proposed variation, and where relevant the surrounding area.

The principal water resources described include the following:

- The catchment in which the proposed lands for rezoning is situated in;
- The local and regional hydrological environment;
- The surface water quality present within the river; and,
- Aquifer classification and existence of high yielding water supply springs/wells in the vicinity of the lands
- natural hydrogeological/karst features in the area
- presence of groundwater-fed ecosystems

4.5.1 Hydrology

The proposed lands for rezoning is located within the Eastern River Basin District (ERBD) in Hydrometric Area No. 09 of the Irish River Network. It is within the River Liffey catchment.



Note: Drawing is for illustrative purposes only; Do not scale

Insert 4.6.1 Variation Lands and local surface water drainage

The River Liffey catchment encompasses an area of approximately 1,369km^2. The river extends from the mountains of Kippure and Tonduff in County Wicklow to the sea at Dublin Bay. The main channel covers a distance of approximately 120km and numerous tributaries enter along its course. The Griffeen River is the nearest water course to the site and is a tributary of the River Liffey.

The Lucan (Tobermaclugg) Stream runs through the site. However, there is no available water quality data for this stream on the EPA Envision website.

The Griffeen River (stream) is located to east of the site. The Griffeen River rises in the town land of Greenoge, approximately 3 km south of the proposed lands for rezoning. It flows in a northerly direction where it is culverted beneath the Grand Canal and from there it flows north through Lucan. The Griffeen River enters the River Liffey just north of Lucan town. A section of the Griffeen River was realigned during the construction of the Grangecastle Business Park and associated access roads and it now runs alongside the local access road in a northerly direction to the east of the site.

The Grand Canal runs in an east to west direction along the northern boundary of the development and is classified as a proposed National Heritage Area (pNHA). The pNHA is an area considered important for the habitats present or which holds species of plants and animals whose habitat needs protection. There is no hydrologic connection between the Variation Lands and Grand Canal.

4.5.2 Surface water body status (water quality)

The proposed lands for rezoning are located within the Eastern River Basin District (ERBD), as defined under the European Communities Directive 2000/60/EC, establishing a framework for community action in the field of water policy, (commonly known as the Water Framework Directive [WFD]).

The WFD requires *'Good Water Status'* for all European waters by 2015, to be achieved through a system of river basin management planning and extensive monitoring. 'Good status' means both *'Good Ecological Status'* and *'Good Chemical Status'.* In 2009 the ERBD River Management Plan (RMP) 2009-2015 was published. A 2018 RMP is in preparation. In the ERB RMP, the impacts of a range of pressures were assessed including diffuse and point pollution, water abstraction and morphological pressures (e.g. water regulation structures). The purpose of this

exercise was to identify water bodies at risk of failing to meet the objectives of the WFD and include a programme of measures to address and alleviate these pressures.

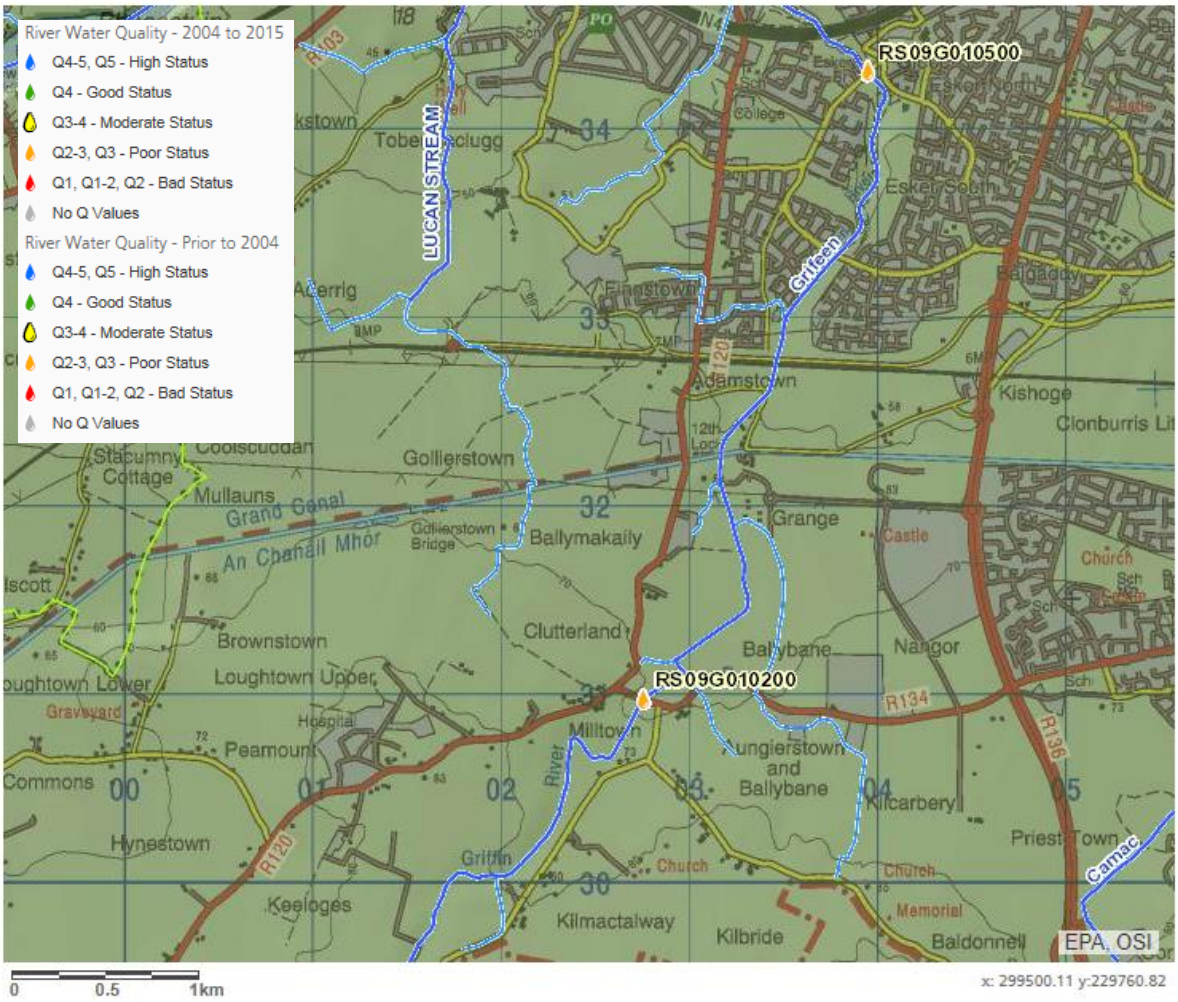
The strategies and objectives of the WFD in Ireland have influenced a range of national legislation and regulations. These include the following:

- Statutory Instrument (SI) No. 293 of 1988 European Communities (Quality of Salmonid Waters) Regulations 1988
- Local Government (Water Pollution) Acts 1977-1990
- SI No. 258 of 1988 Water Quality Standards for Phosphorus Regulations 1998
- SI No. 272 of 2009 European Communities Environmental Objectives (Surface Waters) Regulations 2009

In accordance with the WFD, each river catchment within the ERBD was assessed and a water management plan detailing the programme of measures was put in place for each. For the River Liffey WMU (Water Management Unit) the main pressure preventing achievement of *'Good Status'* is diffuse agricultural pollution. For the purpose of the baseline assessment of the proposed lands for rezoning, the Griffeen River was assessed.

As part of the River Basin Management Plan 2009-2015 the water quality of the Griffeen Lower was assessed. The overall water quality status obtained for the Griffeen Lower was 'Bad' primarily due to its fish status and overall chemical status which each obtained a 'Bad' classification. The overall objective is to achieve 'Good' water quality status by 2027 however the Griffeen Lower has an overall risk rating of '1a' therefore is at risk of not achieving 'Good' status.

From a review of the EPA *Envision* Database, the most up to date status of the Griffeen River at the nearest monitoring stations to the proposed lands for rezoning is *'Poor'.* This monitoring was undertaking prior to 2004 with no subsequent monitoring being undertaken. These stations are located at the first bridge East of Milltown (up-stream) and the Esker Bridge (downstream). The most up to date status of the Liffey River at the nearest monitoring station to the proposed lands for rezoning is *'Good'.* This monitoring was undertaken between 2004 and 2016 at Lucan Bridge, a point approximately 400m downstream from where the Griffeen River enters the River Liffey.



Insert 4.6.2 Surface Water Quality Sampling Results pre 2004 water quality results (Source: EPA Envision Database)

Q Values are used by the EPA to express biological water quality, based on changes in the macro invertebrate communities of riffle areas brought about by organic pollution. See Table 4.6.1, below, for an explanation of the ratings. Q1 indicates a seriously polluted water body; Q5 indicates unpolluted water of high quality.

Table 4.7 EPA Biological Q Ratings

Quality ratings (q)	Status	Water quality
Q5, Q4-5	High	Unpolluted
Q4	Good	Unpolluted
Q3-4	Moderate	Slightly polluted

Quality ratings (q)	Status	Water quality
Q3, Q2-3	Poor	Moderately polluted
Q2, Q1-2, Q1	Bad	Seriously polluted

Surface water drainage

The existing site is a greenfield development where surface run-off will naturally flow into the local streams and rivers, e.g. the Lucan Stream and Griffeen River which is located within the site boundary and approximately 100 metres east of the site, respectively.

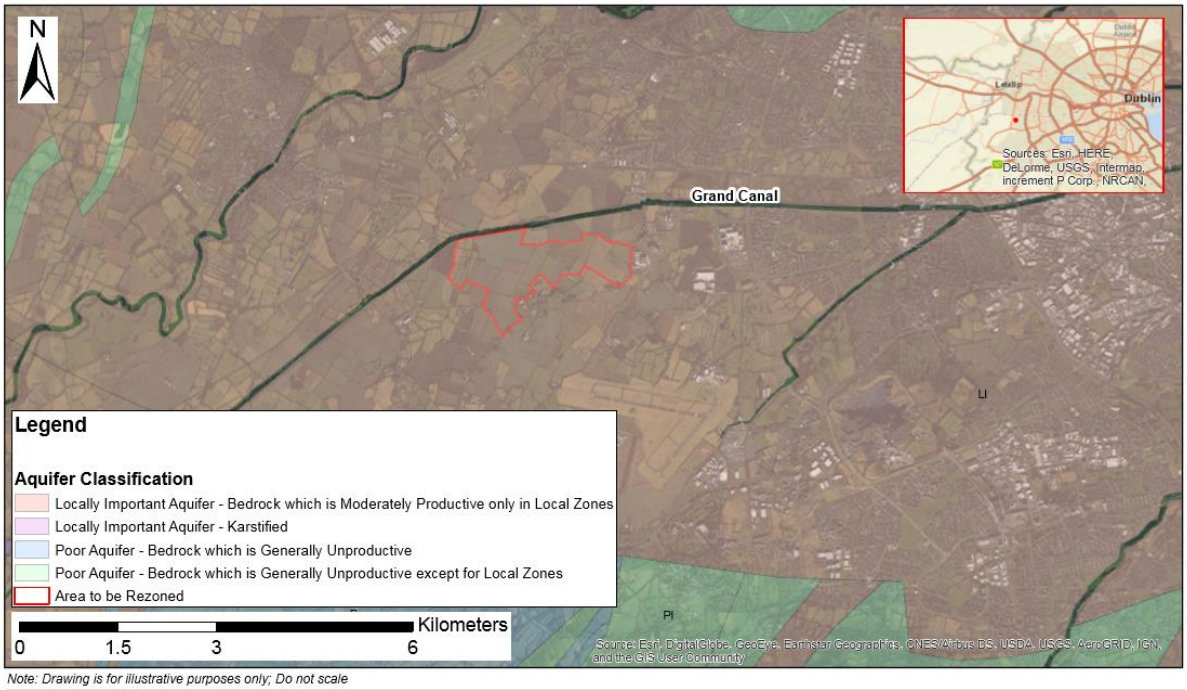
4.5.3 Groundwater body status (water quality)

The overall groundwater body of the area where the proposed lands for rezoning is classed as 'Good' status (GSI, 2013). This indicates that the groundwater is of good ecological and good chemical status.

4.5.4 Hydrogeology

Aquifer classification

An inspection of the available GSI records on-line shows that the bedrock geology of the site and the surrounding area is dominated by Dinantian Limestones (Calp). The GSI has classified this aquifer as Locally Important (LI) i.e. an aquifer which is moderately productive only in local zones.



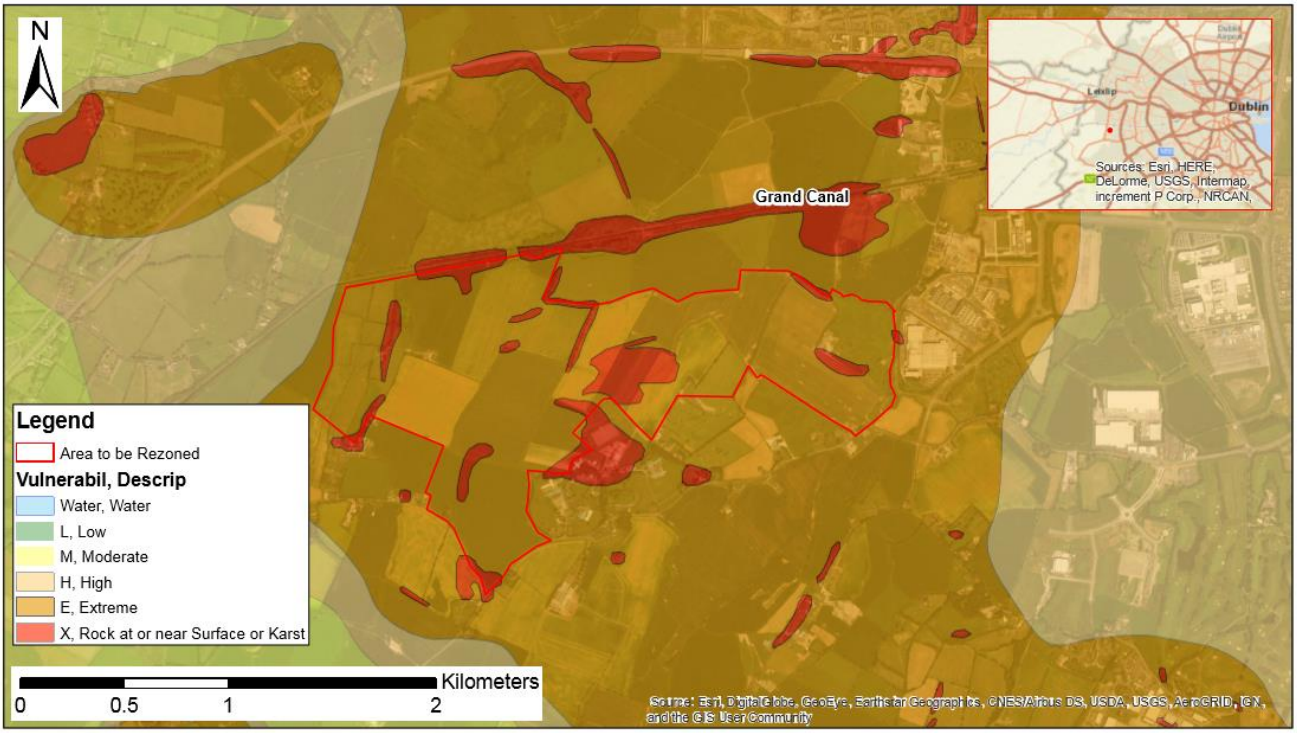
Note: Drawing is for illustrative purposes only; Do not scale

Insert 4.6.3 Variation Lands and Aquifer Classification Map.

Aquifer vulnerability

Aquifer vulnerability is a term used to represent the intrinsic geological and hydrological characteristics that determine the ease with which groundwater may be contaminated generally by human activities. The GSI presently classifies the aquifer in the region of the subject site as High - Extreme (E) which indicates an overburden depth of 0-3m in places.

Insert 4.6.4 Variation Lands and Groundwater Vulnerability Map.



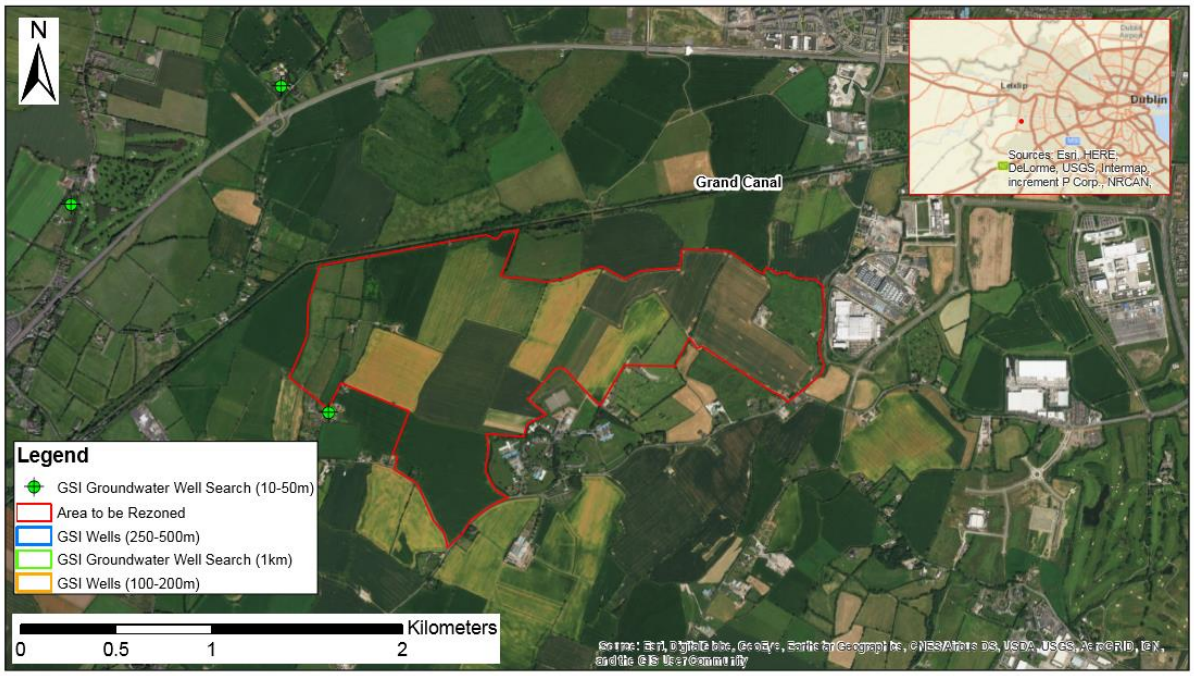
Note: Drawing is for illustrative purposes only; Do not scale

Hydrogeological features

There is no evidence of karstification in this area according to the GSI Karst database (2015). None would be expected in this aquifer type.

Water supplies

The GSI Well Card Index is a record of wells drilled in Ireland. It is noted that this record is not comprehensive as licensing of wells is not currently a requirement in ROI. This current index does not show any wells drilled and springs at the site or surrounding area with the nearest recorded wells located over 3km to the west of the site. The Variation Lands are not located near any public groundwater supplies or group schemes.



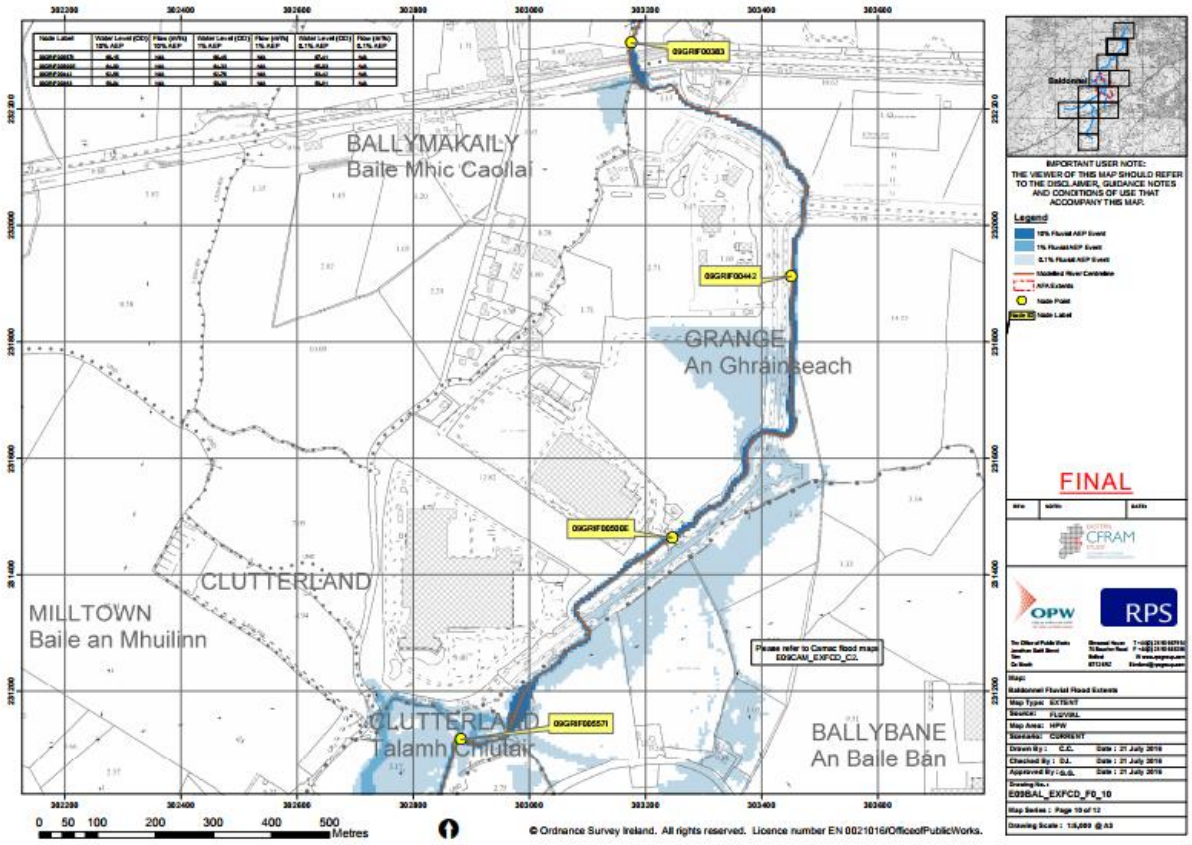
Note: Drawing is for illustrative purposes only; Do not scale

Insert 4.6.5 Variation Lands and well data map.

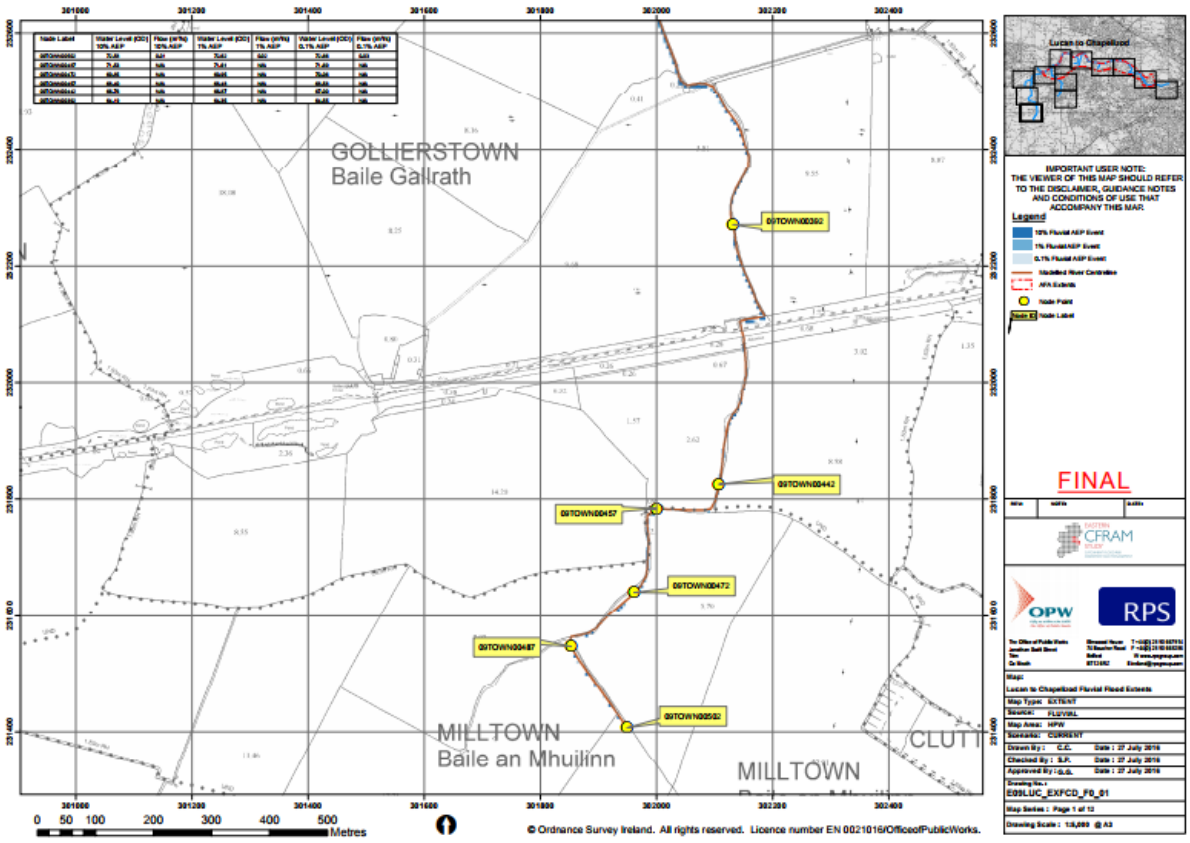
There are no groundwater source protection zones in the immediate vicinity of the site.

4.5.5 Flooding

The Catchment Flood Risk Assessment and Management (CFRAM, Irish) study for the Liffey Catchment and its work is still ongoing for certain areas around Dublin. However, there is a final flood risk map for the proposed lands for rezoning and the surrounding area. Review of the on-line database www.cfram.ie indicated no projected significant fluvial flooding (i.e. the areas projected to be prone to flooding) along the Lucan stream which runs through the site and Griffeen River to the east of the site, based on the final fluvial flood extent maps for the modelled 1 in 10-year, 1 in 100-year and 1 in 1000-year flood events, see Insert 4.6.6 & 4.6.7 below.



Insert 4.6.6 Preliminary Flood Risk Assessment (PFRA) Final Map for the Griffeen River (OPW, 2017).



Insert 4.6.7 Preliminary Flood Risk Assessment (PFRA) Final Map for the Lucan Stream (OPW, 2017).

4.5.6 Existing Environmental Issues

The primary issues for water resources are considered to be:

- The existing status of the receiving waters of the Griffeen and Lucan require improvements in ecological and chemical status to achieve 'good' status as required under the WFD.
- To manage development without areas highlighted at risk of flooding,
- Ensuring that water quality is maintained and enhanced is particularly important. Groundwater in South Dublin currently meets the standards of the WFD, however, it is noted in the Greater Dublin Strategic Drainage Study (GDSDS) that there is a likely possibility of the groundwater in the urbanised northern section of the County being at risk from diffuse sources including inadequate urban sewerage systems and point sources including some contaminated land. This section of the County is classified as being 'at significant risk' of failing to achieve the WFDs objective of 'Good' water status by 2027.

4.6 Climate change, Air Quality & Noise

The European Commission's Strategic Environmental Assessment (SEA) Directive (2001/42/EC) indicates that climatic factors should be considered in the context of the assessment.

4.6.1 Climate Agreements

Ireland ratified the United Nations Framework Convention on Climate Change (UNFCCC) in April 1994 and the Kyoto Protocol in principle in 1997 and formally in May 2002 (Framework Convention on Climate Change, 1997, 1999). For the purposes of the EU burden sharing agreement under Article 4 of the Kyoto Protocol, in June 1998, Ireland agreed to limit the net growth of the six GHGs under the Kyoto Protocol to 13% above the 1990 level over the period 2007 to 2012 (EPA, 2004) (ERM, 1998). The UNFCCC is continuing detailed negotiations in relation to GHGs reductions and in relation to technical issues such as emission trading and burden sharing. The most recent Conference of the Parties (COP22) to the agreement was convened in Marrakesh, Morrocco in December 2016.

The EU, on the 23/24th of October 2014, agreed the "2030 Climate and Energy Policy Framework" (EU, 2014). The European Council endorsed a binding EU target of at least a 40% domestic reduction in greenhouse gas emissions by 2030 compared to 1990. The target will be delivered collectively by the EU in the most cost-effective manner possible, with the reductions in the ETS and non-ETS sectors amounting to 43% and 30% by 2030 compared to 2005, respectively. Secondly, it was agreed that all Member States will participate in this effort, balancing considerations of fairness and solidarity. The policy also outlines, under "Renewables and Energy Efficiency", an EU binding target of at least 27% for the share of renewable energy consumed in the EU in 2030.

The Climate Action and Low Carbon Development Act 2015 outlines in Section 15 "Duties of Certain Bodies", that a local authority should have regard to the following:

(a) The most recent approved national mitigation plan,
(b) The most recent approved national adaptation framework and approved sectoral adaptation plans,
(c) The furtherance of the national transition objective, and
(d) The objective of mitigating greenhouse gas emissions and adapting to the effects of climate change in the State.

The EPA has identified a number of indicators and trends pointing to climate change with the clearest trend evident in the temperature records which show a mean temperature increase of 0.7^{o} C between 1890 and 2008, i.e. an increase of 0.06^{o} C per decade. The increase was 0.4^{o} C during the period 1980-2008, i.e. equivalent to 0.14o C per decade.

Other Indicators are:

- Six of the ten warmest years in Ireland have occurred since 1990.
- A reduction in the number of frost days and shortening of frost season length.
- An increase in annual rainfall in northern and western areas with decreases or small increases in the south and east.
- These changes are reflected in Ireland's natural environment with an increase in the growing season and with greater number of animals suited to warmer temperatures being evident in Ireland and its surrounding waters.

Climate Change impacts are projected to increase in the coming decades and during the rest of this century. Uncertainties remain in relation to the scale and extent of these impacts, particularly during the second half of the century. The greatest uncertainly lies in how effective global actions will be in reducing greenhouse gas emissions.

Key predictions as they relate to climate change for Ireland are:

- The observed warming over the period 1981-2010 is expected to continue with an increase of ~1.5 degrees in mean temperatures by mid-century; the strongest signals are in winter and summer.
- Warming is enhanced for the extremes (i.e. hot or cold days) with highest daytime temperatures projected to rise by up to 2 degrees in summer and lowest night-time temperatures to rise by up to 2-3 degrees in winter.
- Milder winters will, on average, reduce the cold-related mortality rates among the elderly and frail but this may be offset by increases due to heat stress during summer.
- Winters are expected to become wetter with increases of up to 14% in precipitation under the high emission scenarios by mid-century; summers will become drier (up to 20% reduction in precipitation under the high emission scenarios).

- The frequency of heavy precipitation events during winter shows notable increases of up to 20%.
- Changes in precipitation are likely to have significant impacts on river catchment hydrology.
- The models predict an overall increase (0 to 8%) in the energy content of the wind for the future winter months and a decrease (4-14%) during the summer months

4.6.2 Regional Policies

In 2016, "*A Strategy towards Climate Change Action Plans for the Dublin Local Authorities*" (Dublin Local Authorities, 2016) was published and a range of strategies defined.

The document defines the current approach in the following terms: "*Our efforts will concentrate on the actions that we can deliver under our remit as local authorities, and therefore our solutions will focus on those which we can directly control and resource*". The document also defines the vision for the Dublin region: "*To help transform Dublin into a CO_2-neutral and climate resilient region*".

The document focused on seven key areas: citizen & stakeholder engagement, planning, energy, transport, water, waste and ecosystems & biodiversity. The report focuses on both mitigation and adaptation solutions, which will vary between the key areas identified (energy, transport, water, waste etc). The report also outlines examples of possible action areas in terms of planning, energy, transport, water, waste and ecosystems & biodiversity. Final actions plans are expected to be ratified and published in April 2018. The report also commits to communicating the policy messages set out in the Irish Climate Action and Low Carbon Development Act 2015.

4.6.3 Air Quality

The European Commission's Strategic Environmental Assessment (SEA) Directive (2001/42/EC) indicates that air quality should be considered in the context of environmental pathways which may affect human health and ecology.

4.6.4 Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, national and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or "Air Quality Standards" are health or environmental-based levels for

which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set (see Table 4.7.1.1).

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations (2011), which incorporate EU Directive 2008/50/EC which combines the previous air quality framework and subsequent daughter directives (see Table 4.7.1.1). Although the EU air quality limit values are the basis of legislation, other thresholds outlined by the EU Directives are used which are triggers for particular actions.

There are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland. Furthermore, no specific criteria have been set in respect of this development. However, guidelines from the Department of the Environment, Heritage and Local Government currently exist for dust emissions from quarrying and ancillary activities (DOEHLG, 2004). These can be implemented with regard to dust emissions from construction sites.

With regard to dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/(m^2*day) averaged over a one year period at any receptors outside the site boundary. Recommendations outlined by the Department of the Environment, Health & Local Government (DOEHLG, 2004), apply the Bergerhoff limit of 350 mg/(m^2*day) to the site boundary of quarries.

The concern from a health perspective is focused on particles of dust which are less than 10 microns. EU ambient air quality standards (Council Directive 2008/50/EC transposed into Irish law as S.I. 180 of 2011) centres on PM_{10} (particles less than 10 microns) as it is these particles which have the potential to be inhaled into the lungs and cause some adverse health impact. The Directive also sets an ambient standard for $PM_{2.5}$ (particles less than 2.5 microns) which came into force in 2015 (see Table 4.7.1.1).

Pollutant	Regulation Note 1	Limit Type	Value
Nitrogen Dioxide	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year.	200 µg/m^3 NO_2
		Annual limit for protection of human health.	40 µg/m^3 NO_2
		Annual limit for protection of vegetation.	30 µg/m^3 NO + NO_2
Lead		Annual limit for protection of human health.	0.5 µg/m^3
Sulphur dioxide		Hourly limit for protection of human health - not to be exceeded more than 24 times/year.	350 µg/m^3
		Daily limit for protection of human health - not to be exceeded more than 3 times/year.	125 µg/m^3
		Annual & winter limit for the protection of ecosystems.	20 µg/m^3
Particulate Matter (as PM_{10})		24-hour limit for protection of human health - not to be exceeded more than 35 times/year.	50 µg/m^3 PM_{10}
		Annual limit for protection of human health.	40 µg/m^3 PM_{10}
$PM_{2.5}$		Annual limit for protection of human health.	25 µg/m^3 $PM_{2.5}$
Benzene		Annual limit for protection of human health.	5 µg/m^3
Carbon monoxide		8-hour limit (on a rolling basis) for protection of human health.	10 mg/m^3 (8.6 ppm)

Note 1 EU 2008/50/EC – Clean Air For Europe (CAFÉ) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC

Table 4.7.1.1 Air Quality Standards Regulations 2011 (Based on Directive 2008/50/EC and SI 180 of 2011).

4.6.5 Regional Policies

In 1999, the four Local Authorities in the Dublin region produced the "*Dublin Regional Air Quality Management Plan*" (Dublin Local Authorities, 1999). The plan identified a range of strategies and actions to be implemented over the next five years. The plan included the introduction and expansion of the LUAS light rail network, the expansion of the Quality Bus corridors, restrictions on heavy good vehicles (HGVs) in Dublin City Centre and the completion of the port tunnel.

In 2009, the "*Dublin Regional Air Quality Management Plan 2009-2012*" (Dublin Local Authorities, 2009) was updated and a range of strategies defined. The strategies included an improvement in co-ordination to build on the good work to date, to mainstream air quality management into all major policy areas, strengthen the decision-making by improving sharing of information on air quality, introduce measures related to local authority activities that will reduce air emissions and identify and prioritise the main potential threats to air quality.

In relation to specific policies, five strategies were formulated as outlined below:

Strategy 1: Improve co-ordination of our efforts and build on the good work to date.

Strategy 2: Mainstream air quality management into all major policy areas.

Strategy 3: Strengthen evidence-based decision-making by improving how we share information on air quality.

Strategy 4: Lead by example with measures related to local authority activities that will reduce emissions.

Strategy 5: Identify and prioritise tackling main potential threats to air quality.

The document "*Dublin Regional Air Quality Management Plan for Improvements in Levels of Nitrogen Dioxide in Ambient Air Quality*" is a companion document to the plan. The document defines the current strategic planning approach as the promotion of "*consolidated urban development based on enhanced public transport*" and outlines a range of measures and policies which will help to improve ambient levels of NO_2.

4.6.6 Existing environment

Sensitive Receptors

Based on the "*Draft Advice Notes for Preparing Environmental Impact Statements issued by the EPA*" (EPA, 2017), the following types of sensitive receptors should be noted in particular during impact assessment:

- homes;
- hospitals;
- hotels and holiday accommodation; and
- schools and rehabilitation workshops.

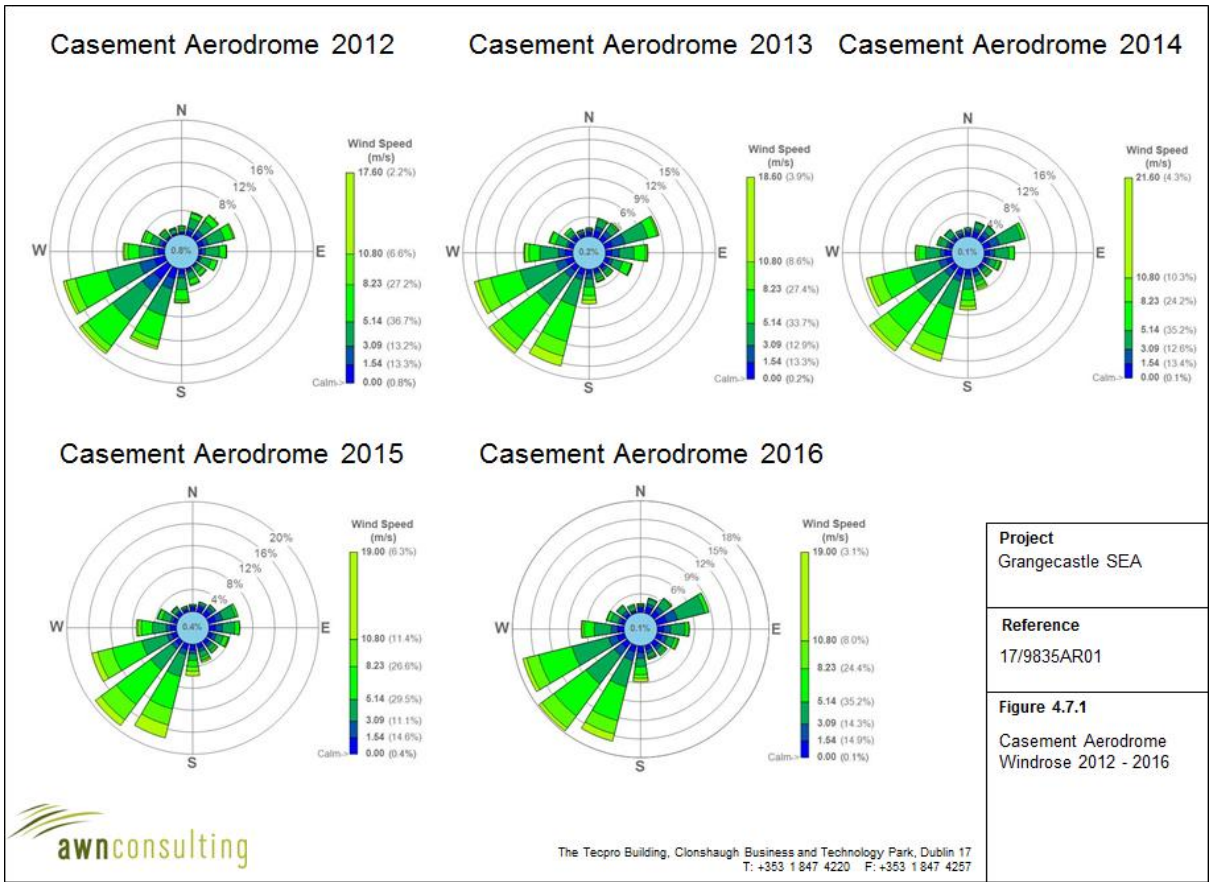
The principal sensitive receptors within the environs of the study area include residential properties mostly located along the R120. Peamount Hospital is located directly south of the study area and is bounded by the R120 to the south. The closest village to the study area is Newcastle (located approximately 2km south-west of the study area).

4.6.7 Meteorological Data

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual

receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels) (WHO, 2006). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM_{10}, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than $PM_{2.5}$) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles ($PM_{2.5}$–PM_{10}) will actually increase at higher wind speeds. Thus, measured levels of PM_{10} will be a nonlinear function of wind speed.

The nearest representative weather station collating detailed weather records is Casement Aerodrome, which is located approximately 2km south of the site. Casement Aerodrome meteorological data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see Figure 4.7.1). For data collated during five representative years (2012-2016), the predominant wind direction is westerly and south-westerly. The mean wind speed is approximately 5.5 m/s over the period 1981 – 2010.



4.6.8 Available Background Data

As part of the implementation of the Framework Directive on Air Quality (1996/62/EC), four air quality zones have been defined in Ireland for air quality management and assessment purposes (EPA, 2017). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 21 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000, is defined as Zone D. In terms of air monitoring, the study area is categorised as Zone A (EPA, 2017).

Air quality monitoring programs have been undertaken throughout Ireland in recent years by the EPA and local authorities. The most recent EPA annual report on air quality monitoring undertaken throughout Ireland is entitled "*Air Quality in Ireland 2016 - Indicators of Ambient Air Quality"* (EPA, 2017). Although no EPA or Local Authority monitoring has been carried out within the study area, data from Zone A locations in Dublin can be used to provide an indication of the prevailing air quality conditions.

With regard to NO_2, continuous monitoring data from the EPA at suburban (non-roadside) Zone A locations in Rathmines, Dun Laoghaire, Ballyfermot and Swords

show that current levels of NO_2 are below the annual limit value with few exceedances of the one-hour limit value. Average levels ranged from 16 µg/m^3 in Swords to 20 µg/m^3 in Rathmines in 2016. Based on these results, a conservative estimate of the background NO_2 concentration in Grangecastle in 2017 is 20 µg/m^3.

Continuous PM_{10} monitoring carried out at the suburban (non-roadside) locations of Rathmines, Davitt Road, Ballyfermot, Dun Laoghaire and Tallaght showed average levels of 11-15 µg/m^3 in 2016 with at most 3 exceedances (in Rathmines) of the 24-hour limit value of 50 µg/m^3 (35 exceedances are permitted per year). In addition, the average PM_{10} level at the urban background monitoring location in the Phoenix Park in 2016 was 11 µg/m^3, with no exceedances of 50 µg/m^3. Based on the EPA data, a conservative estimate of the background PM_{10} concentration in Grangecastle in 2017 is 15 µg/m^3.

Continuous $PM_{2.5}$ monitoring carried out at the Zone A locations of Coleraine Street, Rathmines, Finglas and Marino showed average levels of 7 - 10 µg/m^3 respectively in 2016 (EPA, 2017). The annual average level measured in Rathmines in 2016 was 10 µg/m^3, with an average $PM_{2.5}/PM_{10}$ ratio of 0.67. Based on this information, a ratio of 0.67 was used to generate a background $PM_{2.5}$ concentration in the region of the proposed development in 2017 of 10 µg/m^3.

In summary, existing baseline levels of NO_2 and $PM_{10}/PM_{2.5}$ based on extensive long-term data from the EPA are expected to be well below ambient air quality limit values in the study area.

4.6.9 Noise

The proposed rezoned lands in general are located in a semi-rural setting set back from dominant transport noise sources, however there are a number of industrial and commercial facilities in close proximity to the lands which include a mixture of pharmaceutical facilities, data centres and other manufacturing facilities which influence the character of the surrounding noise environment to an extent, particularly along the eastern boundary.

The existing noise environment in the vicinity of the development area has been reviewed and characterised through available published sources as described below.

Environmental Noise

Environmental noise is treated in a different way to noise nuisance. A nuisance noise is something that occurs from time to time and is not usually considered to be a feature of life in the local area. For example, a noisy dog or late night parties are short term occurrences. Even if they happen regularly, they are not caused by any long term activities and so they are thought of as nuisance noise. Environmental noise is from long term or permanent sources, like major transport routes and factories. Noise from these sources has a different effect on people and is managed in a different way. The Environmental Noise Directive was written into Irish law in 2006, through The Environmental Noise Regulations (Statutory Instrument No. 140 of 2006). This law relates to the assessment and management of environmental noise. They provide for a common approach intended to avoid, prevent or reduce the harmful effects, including annoyance, due to exposure to environmental noise. These regulations do not apply to nuisance noise which can be dealt with under the Environmental Protection Agency Act.

Noise Action Plans are required under the Environmental Noise Directive (EU 2002/49/EC) transposed in to Irish law by SI 140 of 2006. South Dublin in conjunction with the other three Dublin local authorities have prepared a plan for 2013-2018 and establishes the measures that the councils intend to take to manage environmental noise exposure. The plan also contains an assessment of possible noise hotspots throughout the area. The Noise Action Plan identifies for South Dublin the following noise sensitive locations:

"*There are five rivers with associated parklands and walks, two of which contain proposed Natural Heritage Areas, and the Grand Canal with associated green spaces and walking routes which is also a proposed Natural Heritage Area*."

Road Traffic Noise

As part of the Environmental Noise Regulations 2006 (SI 140, 2006), environmental noise mapping of all roads with a traffic flow of approximately 8,220 vehicles per day or more has been undertaken by the four Dublin Local Authorities in the Dublin Agglomeration as part of the *Dublin Agglomeration Environmental Noise Action Plan* (2013 – 2018) to identify noise levels associated with road traffic. The most current mapping relates to traffic flows along the surrounding road network for 2011.

The figure below presents the calculated 24hr noise contours relating to road traffic in the vicinity of the proposed re-zoned lands and indicates the approximate boundary of the SEA study area.

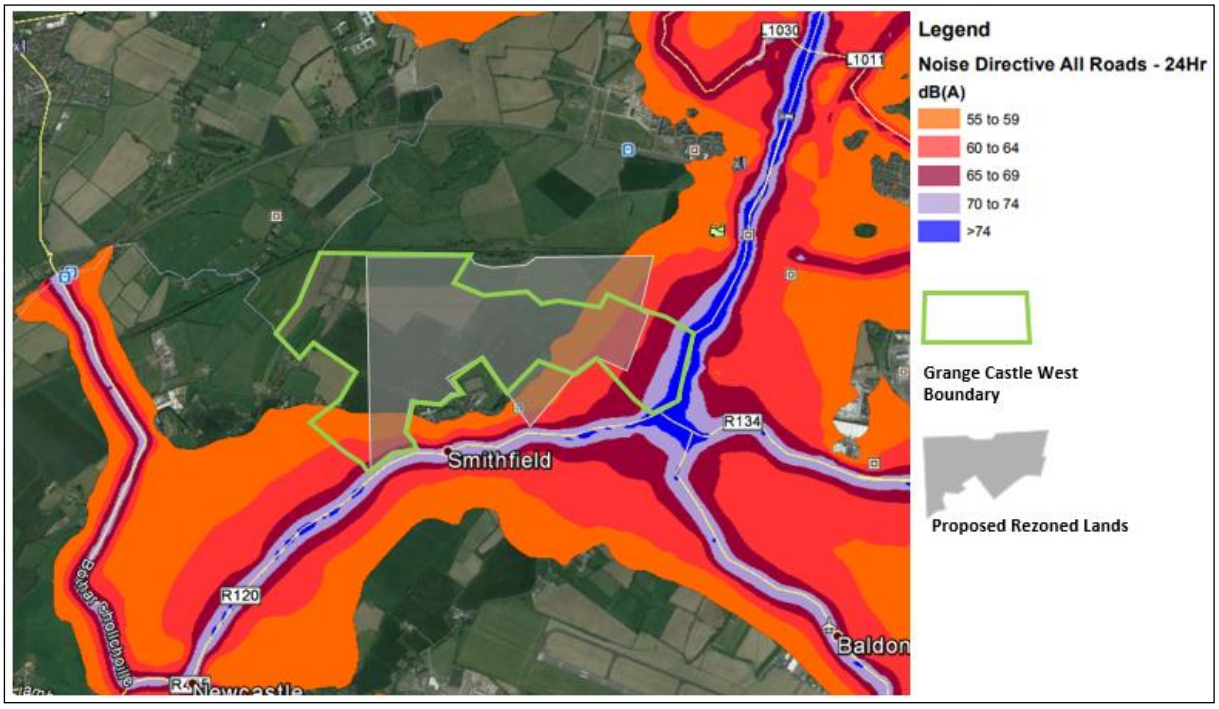


Figure 4.7 L_{den} Noise Contours in Vicinity of Proposed Lands

Reference to the L_{den} noise contour mapping, road traffic noise levels across the majority of the site are below 55dB $L_{den.}$ Along the south-western perimeter, road traffic noise levels are calculated in the range of 55 to 69dB L_{den} depending on the distance from the roadway. A small number of residential properties are located along this road along the south-west boundary. Peamount Hospital is located along the mid-southern boundary which is also influenced by road traffic along the R120 Road with road traffic noise levels calculated in the range of <55 to 65dB L_{den} across the hospital grounds.

The Figure below presents the night-time road traffic noise contour calculated in the vicinity of the proposed re-zoned lands. Night-time noise levels are below 45dB L_{night} across the majority of the lands with noise levels between 45 and 59dB L_{night} calculated along the south-western boundary in proximity to the R120 Road.

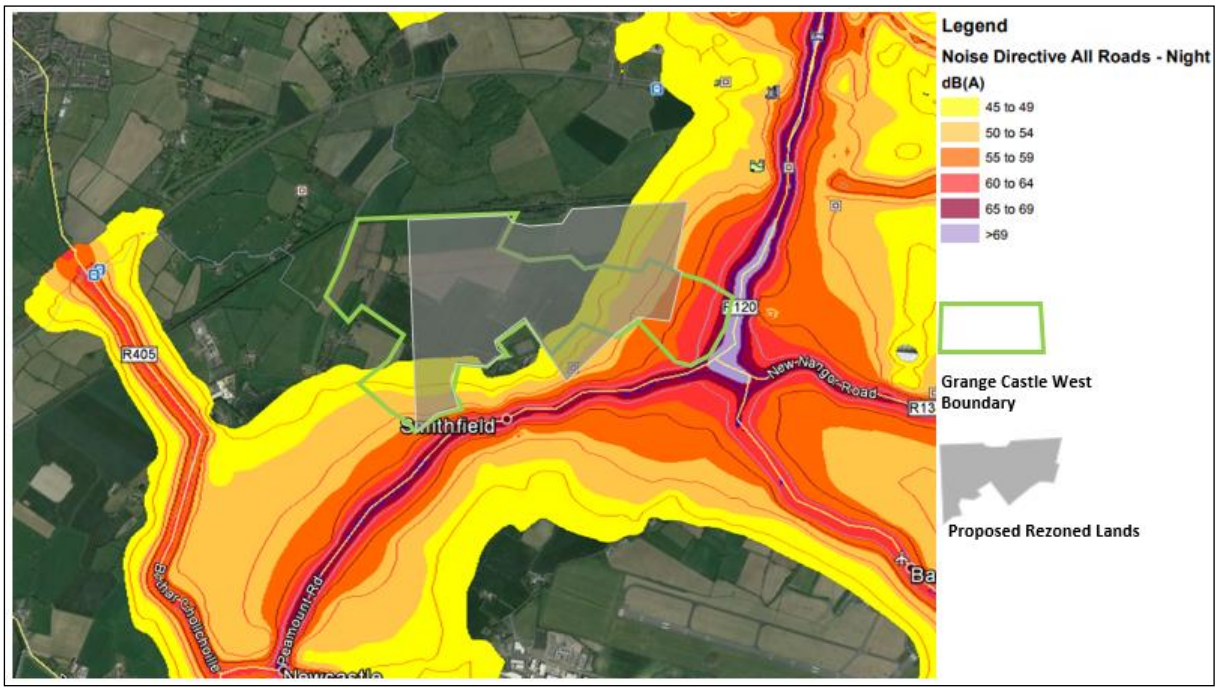


Figure 4.8 L_{night} Noise Contours in Vicinity of Proposed Lands

Rail Noise

The Dublin to Cork Railway Line lies approximately 1km to the north of the development site. As part of the Environmental Noise Regulations 2006, all major railways with greater than approximately 82 rail passages per day were modelled by Irish Rail and the related noise levels mapped. Figure 4.7.2.3 presents the mapped noise contours for the 24hour period (L_{den}) and the night-time period (L_{night}) for the Dublin-Cork railway line in the vicinity of the lands in question. The approximate location of the proposed rezoned lands is also illustrated for reference. Calculated noise levels associated with the rail line are well below 55dB L_{den} and below 45dB L_{night} across the proposed rezoned lands and passing rail traffic is considered to have an insignificant contribution to environmental noise levels in this area.

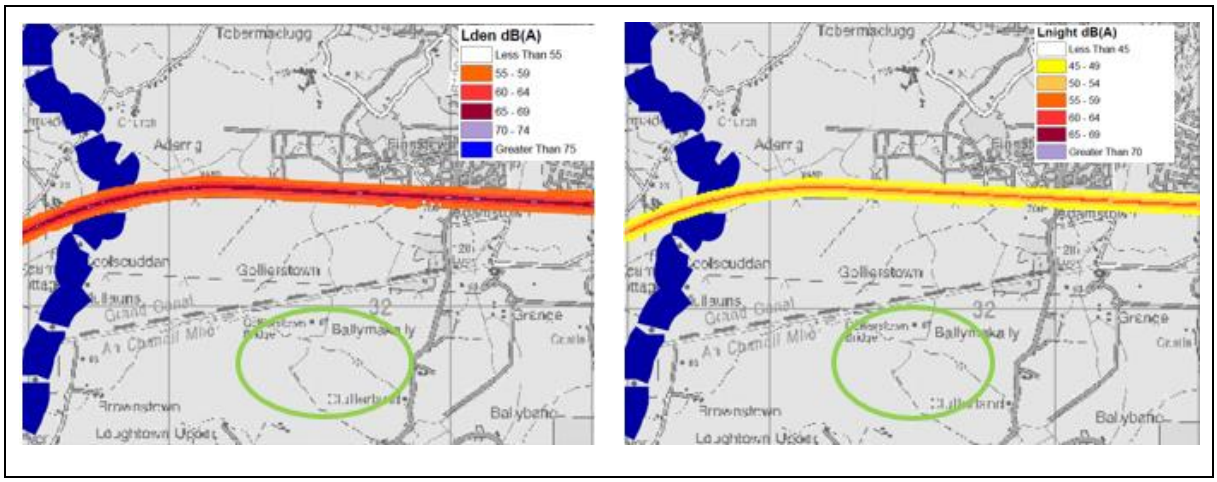


Figure 4.9L_{den} and L_{night} noise contours relating to rail traffic movements

Industrial Noise

The east of the proposed rezoned lands is predominately industrial with both the Grangecastle Business Park and Profile Park located east and south east respectively. These business parks include a mixture of commercial and industrial facilities including pharmaceuticals, manufacturing and data centres with a number of permitted but not yet constructed similar facilities within the parks. Noise levels associated with EPA licensed facilities (under an IED Licence) within the Grangecastle business Park are limited to noise emission limits of 55dB L_{Aeq} during daytime periods and 45dB L_{Aeq} during night-time periods at the nearest noise sensitive locations to their site boundaries. Facilities which are not licensed by the EPA have similar or lower noise emission limit values which form part of their grant of planning.

Overall, along the south east and south western boundaries, noise levels are dominated by road traffic noise. Residential properties along the R120 Road to the east and south and across the Peamount Hospital experience highest road traffic noise levels, however these are typically below the *undesirably high* noise threshold defined in the NAP. Within the remaining portion of the lands and at noise sensitive properties to the west, mapped noise levels are typically within the *desirably low* threshold noise levels. Noise from existing industrial facilities are insignificant across the proposed rezoned lands, particularly moving from east to west.

4.6.10 Existing Environmental Issues

- Variation LandsIn summary, existing baseline levels of NO_2 and $PM_{10}/PM_{2.5}$ based on extensive long-term data from the EPA are expected to be well below ambient air quality limit values in the study area.

Overall, along the south east and south western boundaries, noise levels are dominated by road traffic noise. Residential properties along the R120 Road to the east and south and across the Peamount Hospital experience highest road traffic noise levels, however these are typically below the undesirably high noise threshold defined in the NAP. Within the remaining portion of the lands and at noise sensitive properties to the west, mapped noise levels are typically within the desirably low threshold noise levels. Noise from existing industrial facilities are insignificant across the proposed rezoned lands, particularly moving from east to west. Maintaining and where possible, enhancing these levels are an important consideration given the proposed change from agricultural and enterprise use.

Adaptation to climate change and ensuring energy efficiency are important considerations for the Variation.

4.7 Cultural Heritage

4.7.1 Archaeology

National Monuments & RMP / SMR Sites

There are no National Monuments within or in the vicinity of the Grange Castle Western Lands.

There is one recorded archaeological site located within the Grange Castle Western Lands. The enclosure site was identified in 2015 from aerial photography and added to the Sites and Monuments Record as SMR No. DU017-095 (the site is scheduled for inclusion in the next revision of the Record of Monuments and Places, RMP). It comprises a sub-circular enclosure visible as a crop mark on an aerial photograph (Dimensions: c. 56m WNW/ESE by c. 49m NNE/SSW). The site is located in Loughtown Upper Townland (ITM centre-point 700903, 731247).

There is also a considerable number of recorded archaeological sites within approximately 1.5km of the Grange Castle Western Lands, as illustrated on Figure 8.

Previous Archaeological Investigations

Archaeological monitoring of the Lucan to Palmerstown Water Supply Scheme pipeline in 2002, however, uncovered a previously unknown cemetery site in the northern sector of the Grange Castle Western Lands in Milltown townland (Licence No. 02E1281; Figure 9).

Monitoring of the removal of topsoil along the pipeline corridor at Milltown revealed a new cemetery site, which was located in open farmland and not directly close to any known historic monument. Preliminary recording of the extent and apparent east west orientation of the burials, within the pipeline corridor, suggests an early Christian date, however this could only be proven conclusively through any future excavation.

The burials appeared to extend westwards outside the pipeline corridor and may indicate other associated archaeological features present in this field. The skeletal material exposed appeared to have been partially disturbed, most likely from past ploughing, and were generally in a poor state of preservation. There were no finds noted which may have been associated with the burials. In agreement with the relevant authorities, the skeletal deposits remain *in situ*, and the pipeline route was re-directed 10m east into the adjacent eastern field, in which no evidence for skeletal deposits was found during archaeological monitoring.[6]

Archaeological investigations in the surrounding area, particularly in relation to the Grange Castle Business Park located to the east of the study area have added a great deal to the archaeological record in the two decades and indicates the archaeological richness of the lands. Numerous sub-surface sites have been identified dating from the Neolithic through to the early modern periods. This has added significantly to our understanding of this area, where the upstanding archaeological remains largely reflect the medieval/post-medieval occupation of the area. Excavations in Grange, Nangor, Kishoge and Kilmahuddrick townlands, for example, to the east and northeast of the study area have revealed several prehistoric monuments dating to the Neolithic period, the Bronze Age and Iron Age.

More recent investigations have also augmented our knowledge base for activity during the early medieval period, which has proven to be even more extensive than the upstanding remains would suggest. Geophysical survey was undertaken in 2015

[6] Kehoe, H. 2002. *Archaeological Monitoring Report, Lucan-Palmerstown Pipeline, High level water supply scheme, Licence No. 02E1281*. Unpublished report.

in Ballybane townland, in an area containing two recorded sub-surface archaeological sites that were identified through aerial survey (SMR DU021-108 and DU021-109). Subsequent archaeological testing and excavations identified an early medieval settlement complex comprising at least four separate enclosures, c. 400m southeast of the Grange Castle Western Lands (Licence No. 16E0531). Archaeological investigations further east / northeast in the same townland identified several early medieval enclosures (dated to the 7th and 8th centuries AD) that appear to represent ritual and ceremonial activities (Licence No. 13E0471).

Aerial Photographic Analysis

Given the proven archaeological potential of this landscape and the identification of a site from aerial photography (SMR No. DU017-095 above), an examination of available aerial imagery from 1995 to present was undertaken for this report (www.osi.ie & Google Earth). It identified a further six features / complexes of features that may represent previously unknown, below-ground archaeological sites located within the Grange Castle Western Lands or on its immediate boundary (Table 7; Figure 9).

Table 4.8 Potential archaeological sites identified through aerial photographic analysis

Feature ID	Location	Description
AP 1	Brownstown Td (ITM centre-point 700461, 731089)	Large sub-circular enclosure (c. 74m E/W, c. 57m N/S) with possible annexe on NW side (c. 60m E/W, c. 40m N/S). Visible as cropmarks on 1995 OSi aerial imagery. At the western boundary of Grange Castle Western Lands.
AP 2	Loughtown Td Upper (ITM centre-points 700990, 730909 701025, 730881)	Two small curvilinear enclosures (c. 16-18m diameter), visible as cropmarks on 1995 OSi aerial imagery.
AP 3	Milltown Td (ITM centre-point 701346, 731527)	Sub-circular enclosure (c. 30m N/S by c. 23m E/W), visible as cropmarks on 1995 OSi aerial imagery.
AP 4	Milltown Td (ITM centre-point 701650, 731563)	Curvilinear feature, possibly part of large sub-circular enclosure (c. 75m NNE/SSW by 45m ENE/WSW), with small enclosure on NE side (c. 23m diameter). Visible as cropmarks on 2000 OSi aerial imagery. Located on NW bank of stream, at curve in field boundary. Additional features visible on SE side of stream in neighbouring field (see AP 5).
AP 5	Milltown Td (ITM centre-point 701715, 731497)	Complex of features visible as cropmarks on current aerial imagery (OSi Digital Globe). Although difficult to decipher, there appears to be at least two enclosures; a larger subcircular one measuring c. 37 x c. 21m and a smaller circular enclosure c. 18m diameter. Traces of two arcing lines are visible to the N and NE, suggesting the presence of further enclosures. Two linear features may form part of a large rectilinear enclosure to the WSW (c. 37m x c. 60m). Given the proximity of the stream, it is possible that these features (and those noted above in AP 4) may be the result of drainage activity / waterlogged ground. Nonethless, intensive agricultural activity (e.g. ploughing) can mask the presence of below-ground archaeological

		sites and features and there is proven potential in this area for the discovery of previously unknown archaeological sites.
AP 6	Peamount Td (ITM centre-point 700714, 730677)	Two small enclosures and a possible third, visible as cropmarks on current aerial imagery (OSi Digital Globe). The easternmost enclosure is the clearest (c. 25m x 15m), with hints of a double-ditch and possible internal features. Approximately 65m west a possible second sub-circular enclosure is just about visible, of similar size. A curving line between the two may form part of third enclosure.

Figure 4.10 RMP / SMR sites within c. 1.5km of Grange Castle Western Lands (shown in pink)

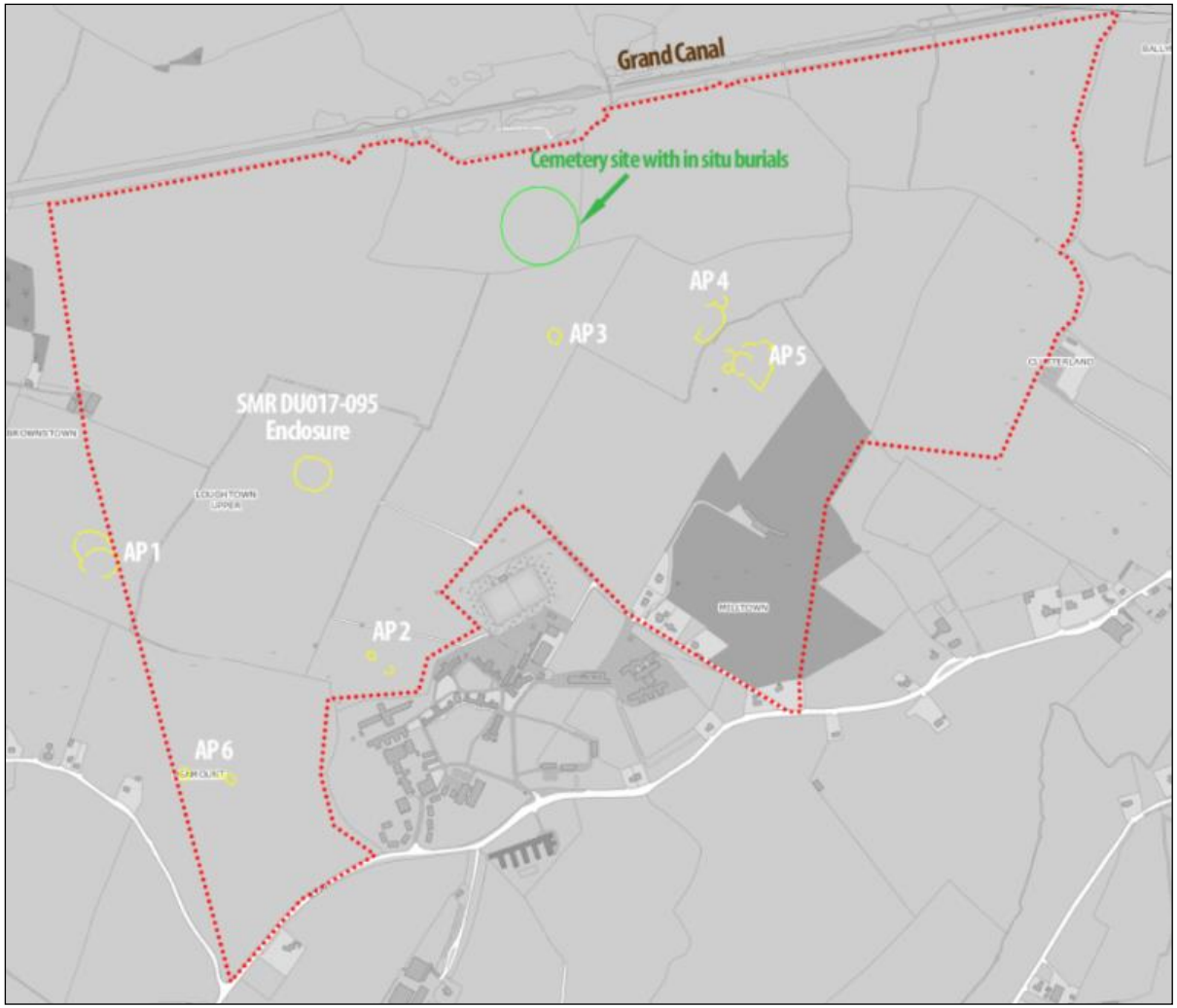


Figure 4.11 Location of archaeological constraints within Grange Castle Western Lands (shown in red)

4.7.2 Architectural Heritage

There are no architectural heritage constraints within the Grange Castle Western Lands, with all of the protected structures and NIAH sites located on the periphery or in the vicinity.

Protected structures in the vicinity of the Grange Castle Western Lands include several 18th and 19th century farmhouses, as well as a cluster of structures within the former Peamount demesne, now Peamount Hospital. In addition, there is a number of protected structures located along the Grand Canal, many of them associated with the canal infrastructure, representing the industrial and built heritage of this area. These are primarily clustered at the 12th Lock and Leck Bridge, including two former mill buildings and a Lock-Keeper's Cottage. They also include Gollierstown Bridge just north of the Grange Castle Western Lands (RPS No. 131 on Figure 10) and Grange Cottage to the east of the 12th Lock. With the exception of the bridges and the lock itself, all of the structures are set back from the canal, at the side of the tow path.

Figure 4.12 Location of architectural heritage features, showing Grange Castle Western Lands in pink

4.7.3 Existing Issues

Potential for discovery of additional archaeological resources

- Recognising the cultural heritage of the Grand Canal
- Enhancing and linking cultural heritage of the area into the overall planning framework
- Preserve and create a sense of heritage and identity

4.8 Landscape

The subject lands lie to the west of the existing Grange Castle Business Park and immediately to the south of the Grand Canal. The existing landscape is composed primarily of agricultural land composed of large arable fields surrounded by mixed hedgerows. The terrain is low lying, generally flat and can be described as open in character but interrupted by lines of trees and taller, unmanaged hedgerows. In some places, the perimeter hedgerows of fields are managed, being closely cut to a metre or two in height, in others they are taller and let grow loose. In other places, they also contain lines of mature trees; these hedgerows coincide with shelter belt planting surrounding farm buildings and other settlements.

Specifically, the field patterns within the site are defined by dense hedgerows enclosing large, rectangular fields predominately medium to large in size, which date largely from the 18th or 19th century and reflect the traditional agricultural landscape in this area. In many places this pattern has been modified through boundary removal and land rationalisation to facilitate modern agricultural methods. The Lucan stream (Tobermaclugg) runs through the site from the pNHA Grand Canal.

The land boundary is defined by pNHA Grand Canal and arable lands to the north; Grange Castle Business Park to the east; Peamount hospital to the south and more arable land including sparse sub urban development to the west which also coincides with the County Dublin boundary. Two regional roads transect the site; the R405 to the west and R120 to the south and east but minor roads off the regional road provide access to farmstead and residential areas towards the south and west of the lands. The Grange Castle Business Park South located to the East is a dominating feature located to the immediate east of the lands. Other business parks such as Profile Park and Grange Castle Business Park are also located near the lands.

There are no existing commercial developments within lands proposed for rezoning. Land uses around the area are dispersed with residential settlement ranged along the road

network. There are sub-urban residential developments towards the west of the site; these are sparse and consist of cluster of individual houses arranged in a linear manner along the minor access road from R405. The neighbouring land use also includes Peamount hospital, previously a country home from 1800s. The hospital premises also include an overhead water reservoir. Hence, the Peamount hospital premises demarcate a sensitive neighbouring land.

The land is largely composed of flat terrain. As there are tall field boundaries and few vantage points, therefore the views across the lands are limited. From within the lands, the Dublin Mountains to the south are visible at a long distance. The buildings within the existing Grange Castle Business Park development to the east are visible within eastward views. The Grand Canal is an important semi natural resource to the north of the lands, which is densely planted with semi-natural woodland.

4.8.1 County Development Plan 2016-2022 Designations

The formal designation of the character of the landscape is contained within the County Development Plan 2016-2022, S.9.2.0 and in the County Landscape Character Assessment 2015. The assessment locates the Variation lands in LCA-2 Newcastle lowlands described as low-lying and gently undulating agricultural lands over limestone. It is agricultural land primarily pasture and tillage with a long history of historic settlement and human activity associated with Newcastle village and surrounds.

The LCA describes (of relevance to these lands) the landscape character and type which is denoted by the Grand Canal, discontinuous historic urban and medieval settlement, and Limestone farmland. It also identifies the valuable elements of the landscape to be preserved are pNHA Grand Canal, designed lands and former estates as shown on the NIAH.

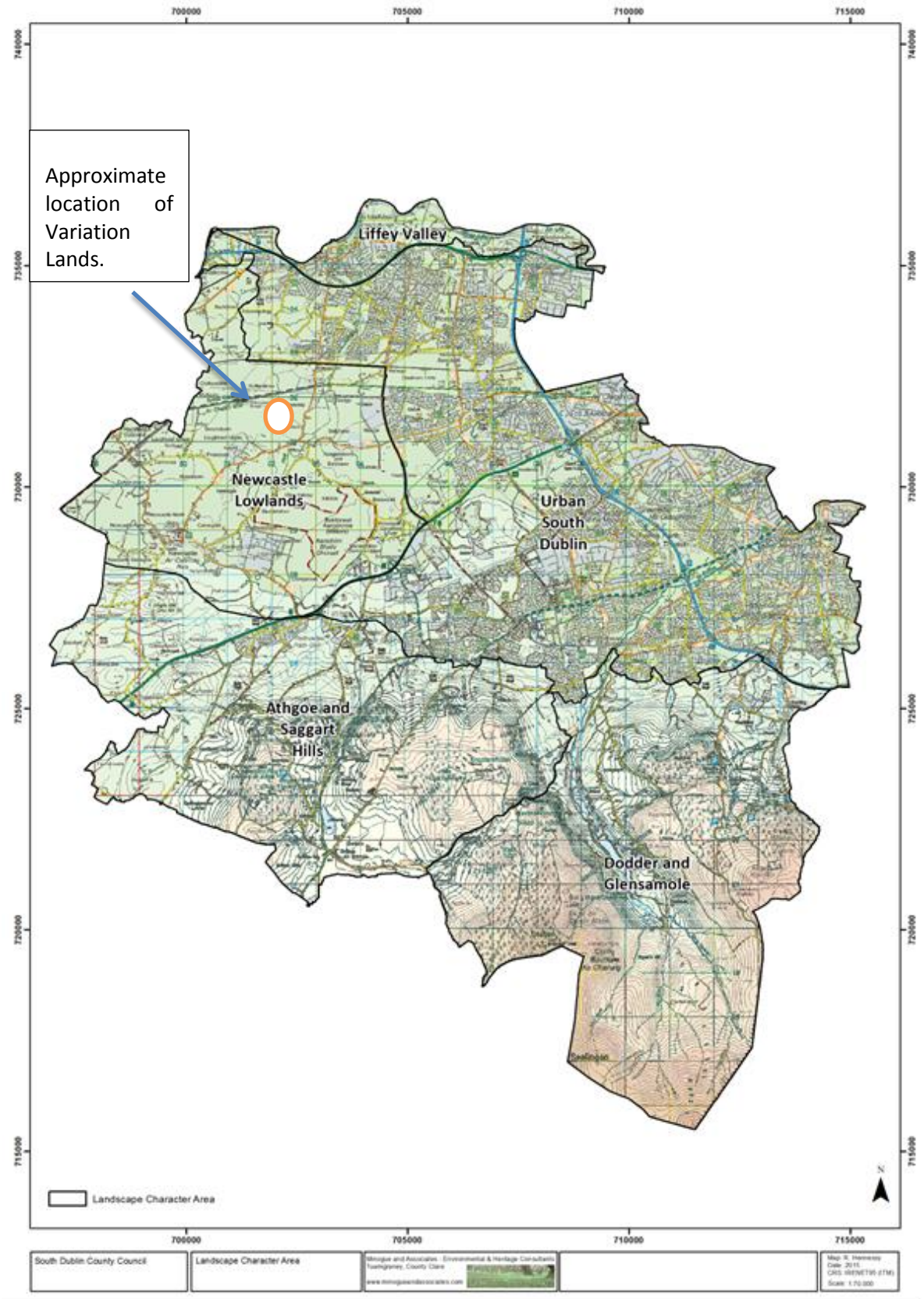


Figure 4.13 Landscape Character Assessment of South Dublin

4.8.2 Key sensitivities in the landscape surrounding the lands

The elements that create a strong landscape character are the Grand Canal, traditional farmlands, and large fields. The Grand Canal is an important recreational route with its associated semi-natural woodland planting and ecological habitats. The fields separated by dense hedgerows reflect the rural character of the landscape. The significance of the effects on the character of the lands and appearance of the landscape will be in proportion to the level of development. The Peamount hospital located in the neighbouring site is also a sensitive area as it was originally a country house from 1800s converted to the hospital as we know it today.

4.8.3 Key landscape sensitivities within the Variation lands

The forces of change for the landscape stated in the LCA are

- increasing urban influence that impacts the rural character,
- vulnerability of the landscape to adverse visual/landscape impacts

The recommendations include- boundary treatment at the fringe close to the urban development and maintaining the recreational value of the Grand Canal as well as retaining the overall rural character of the lands as intact and cohesive and strengthening the relationship between the historic core and surrounding character with stronger design of new developments.

4.8.4 Key elements that contribute to local landscape character

The elements that establish the character of the landscape are listed below.

- The Grand Canal as a valuable source for recreation and biodiversity.
- The plantation along the Grand Canal which provides rich biodiversity.
- The Peamount hospital to the south of the lands.
- The loss of the arable and agricultural landscape.
- The Lucan stream as a green infrastructure resource.
- The protection of the existing shelter belt planting and boundary hedgerows which provide ecological connectivity and biodiversity, and can provide opportunities for screening within the proposed lands.
- Increasing urban development influencing the rural landscape character.

An appropriate layout for any development and retention of certain landscape features coupled with appropriate design and mitigation measures will reduce the significant effects on the sensitive landscape.

Table 9.1 of the LCA recommends views and prospect that should be protected; whilst the Grand Canal viewpoints were not included in the CDP 2016-2022, most of the hills including Montpelier Hill are listed in the CDP at Table 9.2 In the context of the Variation the following views and prospects though not protected in the SDCDP 2016-2022 are nonetheless relevant and significant:

- the view from any point along the Grand Canal;
- and the ridge line of the Dublin Mountains, Montpelier Hill to the Tallaght Hills.

4.8.5 Existing Environmental Issues

The LCA for Newcastle Lowlands identifies the following issues:

- Increasing urban influences that impact on the rural landscape character
- Fragmentation of agriculture -related habitats through piecemeal development
- Rural housing pressures
- Loss of separation distance between established urban and rural character
- The relatively flat and open landscape is vulnerable to adverse visual and landscape impacts of development.

Local Landscape Character

As a result of the visual and landscape analysis, the following matters are observed to be of relevance:

- The Grand Canal as a valuable resource for recreation and biodiversity
- The loss of a remnant rural landscape in an otherwise heavily urbanised setting.
- The views of the Tallaght Hills
- The views from the Grand Canal in all directions
- The existing hedgerows, which provide ecological connectivity and biodiversity, and afford opportunities for screening.
- Retention of landscape character throughout the development.
- Development around the Grand Canal.
- Open space consideration.
- Screening to the sensitive zones.

4.9 Material Assets

The EPA SEA Process Draft Checklist (2008) defines material assets as the critical infrastructure essential for the functioning of society such as: electricity generation and distribution, water supply, wastewater treatment, transportation, etc. An overview is provided below.

Until recently, buses have been the predominant form of public transport in South Dublin. Significant progress has been made in the last ten years in relation to the provision of rail transport in the County. Major projects include the Luas Red Line and Adamstown Train Station located to the immediate North of the proposed Grange Castle Western lands. The latter has been developed as part of the Kildare Route Project which also duplicated the rail line and introduced a new series of suburban commuter rail stations including Kishogue and Fonthill. The opening of the Phoenix Park Rail Tunnel which connects commuters from the Kildare Line to Dublin City now provides peak services from Kildare to Grand Canal Dock.

A Transport assessment has been undertaken for the proposed SDCC land to be rezoned project where a summary of the existing transport baseline is as provided below.

Cycle Facilities

The Grand Canal Greenway, which traverses the northern boundary of the existing Grange Castle Business Park, links Lucan to Inchicore in the City Centre and provides 8.5km of path for both cyclists and walkers along its southern towpath.

With reference to the proposed rezoned lands site, both the existing northern and southern tow paths attributed to the Grand Canal are located along the proposed sites northern boundary. Both existing towpaths are not developed but are regularly used by walkers, albeit at lower usage levels than the more developed towpaths located to the east.

The existing Regional Road (R136) located to the East of the existing Grange Castle Business Park site includes segregated cycle facilities offering links to Lucan Village, Liffey Valley and the N4. Contained within both existing Grange Castle and Grange Castle South Business Parks is a network of segregated cycle facilities that are regularly used by its residents.

Walking Facilities

Both northern and southern towpaths attributed to the Grand Canal traverse along the proposed rezoned lands footprints northern boundary. Both towpaths are undeveloped but are regularly used by local walkers. As mentioned previously, the Grand Canal Greenway which links Lucan to Inchicore in the City Centre provides 8.5km of surfaced path for both cyclists and walkers. Furthermore and contained within both existing Grange Castle and Grange Castle South Business Parks is a network of segregated cycle and walkway facilities that are regularly used by its residents.

The Fonthill and Grange Castle Roads both have good quality segregated footpaths linking to Adamstown, Lucan Village, Liffey Valley and Grange Castle.

Public Transport Services

Located in close proximity to the proposed rezoned lands site is Clondalkin/Fonthill Train Station that is served by commuter services operating to Heuston Station. The opening of the Phoenix Park Tunnel offers further connectivity to Drumcondra, Connolly, Tara Street, Pearse Street and Grand Canal Dock. Located approximately 2km to the most western point of the proposed rezoned lands site boundary is Hazelhatch and Celbridge Train Station. Access to this train station can be gained from the existing R405 Hazelhatch Road which passes over the existing Grand Canal.

Sandwiched between Clondalkin/Fonthill Train Station and Hazelhatch and Celbridge Train Station is Adamstown Train Station which is located directly north of the proposed Grange Castle West site. A number of bus routes pass within close proximity to the proposed rezoned land site and includes a mix of radial, orbital and local services mainly operated by Dublin Bus.

Road Network

The proposed rezoned lands are located to the West of the existing Grange Castle and Grange Castle South Business Parks, South of the Grand Canal, and continues in a westerly direction where it straddles a portion of the County Dublin/Kildare County boundary line. The existing R120 Regional Road (to be upgraded 2017/2018) traverses the eastern boundary of the proposed rezoned lands.

The proposed rezoned lands site is situated in close proximity to the N7 motorway and Junction which provides access to the west and south west of Ireland. The N7 Junction additionally offers vital connectivity to the M50 Orbital Motorway which is the main gateway to the North and South of Ireland. The M50 Orbital Motorway circles the northern, southern

and western suburbs of Dublin City and provides access to significant infrastructure such as the Port Tunnel, Dublin Port, and Dublin International Airport. Grange Castle is connected to the national road network by its proximity to various arterial routes; within 6km of the M50 (Dublin orbital route), 3km of the N7/M7 (South and South West) and 6km of the M4 (West and North West).

Aviation

Located approximately 3km to the north of the proposed rezoned lands site is Dublin Weston Airport. Dublin Weston Airport is Ireland's only dedicated Executive private jet airport. It is conveniently located only 13 km from Dublin City Centre and has easy access to all of Dublin's major motorways, making it the ideal flight path for corporate travellers.

Located approximately 3km to the south east of the proposed rezoned lands site is Casement Aerodrome based in Baldonnell, County Dublin. Casement Aerodrome is the air component of the Irish Defence Force.

Wastewater and Water Supply

The treatment of wastewater is governed by the Urban Waste Water Treatment Directive (91/271/EEC) (amended by Directive 98/15/EEC) transposed into Irish law by the Urban Waste Water Treatment Regulations 2001 (SI 254 of 2001) and the Urban Waste Water Treatment (Amendment) Regulations 2004 (SI 440 of 2004). The Directive aims to protect the environment from the adverse effects of the wastewater discharges by ensuring that wastewater is appropriately treated before it is discharged back into the environment. The treatment of wastewater is relevant to the Water Framework Directive which requires all public bodies to coordinate their policies and operations so as to maintain the good status of water bodies which are currently unpolluted and bring polluted water bodies up to good status by 2027.

Water Supply

Encompassed within the proposed R120/Nangor Road realignment project is the introduction of a new 400mm diameter water main which is ultimately fed from Belgard reservoir. This proposed 400mm diameter water main will traverse through the newly formed R120/Nangor Road Junction to the south eastern corner of the proposed rezoned lands footprint.

Irish Water have proposed that the Shannon to Dublin Water Scheme will land within close proximity of the existing Peamount Reservoir site. An extension to the existing Peamount Reservoir is proposed as part of this scheme.

Waste Water (Foul)

Wastewater generated within the proposed rezoned lands will discharge into the existing Grange Castle Pump Station which ultimately discharges into the existing Ringsend Waste Water Treatment Plant. At present this Ringsend plant is overloaded. However a project is in place to increase capacity and meet the effluent discharge limits required. These works are planned to proceed in stages to deliver a compliant effluent, at projected increased loads, with the full capacity of 2.4 million population equivalent completed by 2023. There are also plans to construct a new WWTP to the north of Dublin City which will permit flows to be diverted from the Ringsend catchment, thus ensuring that the capacity of Ringsend will be adequate to cater for growth in that catchment well into the future.

Located in close proximity of the proposed rezoned lands site is Tobermaclugg pumping station which was completed in 2008 and ultimately discharges to the 9B trunk sewer at Balgaddy via twin rising mains and a gravity sewer.

Waste Water (Storm)

Based on the existing terrain attributed to the proposed rezoned lands landscape, a mixture of gravity and pumped storm networks will be introduced to cater for the site storm water requirements. Each of the individual plots proposed will be subject to storm water yields in accordance with the Greater Dublin Strategic Drainage Study's (GDSDS) Greenfield Runoff Rate (QBar - Typically 2l/s/Ha). In summary, each individual site will have to retain, through various on-site Sustainable Drainage Systems (SUDS) prior to discharging (Petrol/Oil Interceptor and hydro brake will be introduced at every discharge location) at an allowable rate based on QBar into the proposed storm drainage network that will ultimately accommodate the proposed rezoned lands storm water drainage requirements.

Waste Management

The Regional Waste Management Plan 2015-2021 for the Eastern-Midlands Region encompasses the local authorities: Dublin City, Dún Laoghaire- Rathdown, Fingal, South Dublin, Kildare, Louth, Laois, Longford, Meath, Offaly, Westmeath and Wicklow.

The regional plan provides the framework for waste management for the next 3 years and sets out a range of policies and actions in order to meet the specified mandatory and performance targets.
The Waste Framework Directive"(WFD) has incorporated previous separate directives that addressed waste oils and hazardous waste. Principles in relation to waste prevention, recycling, waste processing and the 'polluter pays' principle are included within this Directive.

In 2014 the EC adopted a communication promoting the Circular Economy. The circular economy considers waste as a resource which in turn can be recirculated into systems that focus on maintaining, repairing, reusing, refurbishing and recycling materials.
Denmark, Sweden, Japan, Scotland and the Netherlands are currently the most advanced countries in terms of embedding the circular economy into their waste management system.
Key elements of the communication include:

- Increase recycling and preparing for municipal waste to 70% by 2030
- Increase recycling and preparing for reuse of packaging waste to 80% by 2030
- An aspiration to eliminate landfill by 2030
- Member states to be responsible for ensuring the separate collection of biowaste by 2025.
- Reduction of food waste by at least 30% by 2025.

Waste is baled at the South Dublin County Council operated Baling Station at Ballymount and is disposed of in the Council's engineered landfill at Arthurstown, Co. Kildare. In addition, South Dublin County Council will be committing a certain amount of waste to the thermal treatment plant in Ringsend within Dublin City Councils administrative area, the construction and use of which forms a part of the waste management strategy for the Greater Dublin Area.

Gas Supply

The proposed rezoned lands can be serviced by an existing high pressure 70bar transmission gas pipeline that runs in a north – south direction adjacent to the Fonthill Road and the Grange Castle Road. A branch connection will provide high pressure Gas to service all of the proposed rezoned lands under consideration.

Telecommunications

The existing T50 fibre network runs in close proximity to the proposed rezoned lands site and currently services the existing Grange Castle and Grange Castle South Business Parks from a section of the T50 network that traverses under the exist Nangor Road (R134) that ultimately loops in a south to south eastern direction following under the footprint of the existing L2901 local Road. The existing T50 infrastructure comprises of an 18 way duct system which is currently owned and operated by Zayo.

Located along the northern tow path of the Grand Canal is an existing Fibre Network ('Inland Fibre' stamped chambers) which could potentially be expanded or included in the proposed telecom network that will feed into the proposed Grange Castle western site from the Grand Canal. This existing fibre Network is owned and operated by EuNetworks.

Furthermore and as referenced previously, the proposed Nangor Road/R120 Realignment project is due to commence on site in late November 2017 with a 15 month programme envisaged. Included within this project is a 16 way telecom ducting network. This 16way telecom ducting network will also be included within the footprint of the newly formed R120/Nangor Road signalised junction that will bring telecommunication infrastructure to the proposed rezoned lands site.

4.9.5 Existing issues –material assets

- Waste management facilities
- water supply, capacity and wastewater treatment
- existing and potential traffic and transport issues
- public transport considerations

- Potential transfer of harmful and contaminating substances through surface water drainage system which ultimately empties to Dublin Bay, thereby providing a hydrological link to the suite of European sites located within the Bay;
- Provision of adequate wastewater treatment with regards to any additional loading which may result with proposed development

The EPA State of the Environment Report 2016 states:

> In relation to transport, there needs to be support for a shift from the private car to an efficient sustainable transport system through a more proactive and systematic approach to land use and transport planning.

4.10 Evolution of the area in the absence of Proposed Variation No.1

The SEA legislation requires that consideration is given to the likely evolution of the current baseline where implementation of the variation does not take place. In the absence of the proposed variation, the environment would evolve under the existing land use zoning and the requirements of the South Dublin County Development Plan 2016- 2022 as follows:

> Principal environmental issues in the absence of the proposed variation are outlined below:

- **Air Quality**: in the absence of the Variation opportunities to develop a comprehensive transport strategy that promotes sustainable transport patterns and reduces private vehicles would not take place. This could give rise to localised air quality issues particularly around the existing regional roads. This may particularly arise in relation to potential intensification of uses around the existing Grange Castle Business Park and incremental development close to the Variation Lands.
- **Noise:** The absence of the Variation could limit the means to implement mitigation measures that can generate multiple benefits through noise abatement measures and green infrastructure, particularly around the Grand Canal and along the existing regional roads.
- **Noise**: Aligned to this, the identification of the Grand Canal as a noise sensitive area may not be fully addressed and planned for the absence of the Variation, with subsequent impacts on human health and biodiversity, flora and fauna in particular.
- **Biodiversity, flora and fauna**: The provision of appropriate buffer zones particularly around the watercourses would likely continue to be the requirement as detailed under Cross Compliance Requirements of Department of Agriculture, food and Marine. This can range from 30m to 5m for spreading of fertiliser depending on water resource under consideration. The Variation allows for a set back and buffer of 30m and 50m to afford the optimal degree of protection to the Grand Canal ecological corridor. Additional measures have also been incorporated through the SEA process as regards maintaining the integrity of the riparian habitats associated with the Canal and other watercourses.

- **Biodiversity:** In the absence of the Variation, the ecology studies have identified areas of particular importance for biodiversity and also located the identification and presence of invasive species. The absence of a co-ordinated approach to these issues in the overall spatial planning would be absent and a piecemeal approach to development may arise; this could generate effects associated with loss of habitat, habitat fragmentation and connectivity, and the spread of alien and invasive species.
- Green Infrastructure: In the absence of the Variation, there would be little or no consideration given to the integration of green and blue infrastructure for the overall scheme and this could give rise to effects associated with increased surface run off, habitat fragmentation, loss of ecological connectivity and multifunctional open space associated with new development.
- **Population and human health**: In the absence of mitigation associated with the Variation, human health has the potential to interact with environmental problems identified under other parameters including biodiversity, flora and fauna, cultural assets, soil and geology, water resources, material assets, landscape and green infrastructure.

4.10.1 Interrelationship of the above components

In accordance with the SEA Directive, the interrelationship between the environmental parameters above must be taken into account. Although all such parameters may be considered interrelated and may impact on each other at some level environmental sensitivity mapping is commonly used to help identify areas of greater or lesser sensitivity. The Environmental Sensitivity Map shows the overall environmental sensitivity for the plan area and sphere of influence, and follows the same approach (i.e.: ranking of environmental parameters) as that used in the South Dublin CDP 2016-2022 SEA process.

By mapping key environmental layers (GIS) to produce an environmental sensitivities map, it provides a visual impression which can assist in identifying which areas within the Plan area experience the highest concentration of environmental sensitivities and consequently the areas potentially most vulnerable to potential environmental impacts from development. This can be a useful guide when considering the strategic options in relation to the plan during the early stages in the plan making process, and identifying areas that are of greater or lesser vulnerability. Figure 4.15 shows the environmental sensitivity map for the Variation lands and Figure 4.16 shows the key interrelationships between environmental parameters.

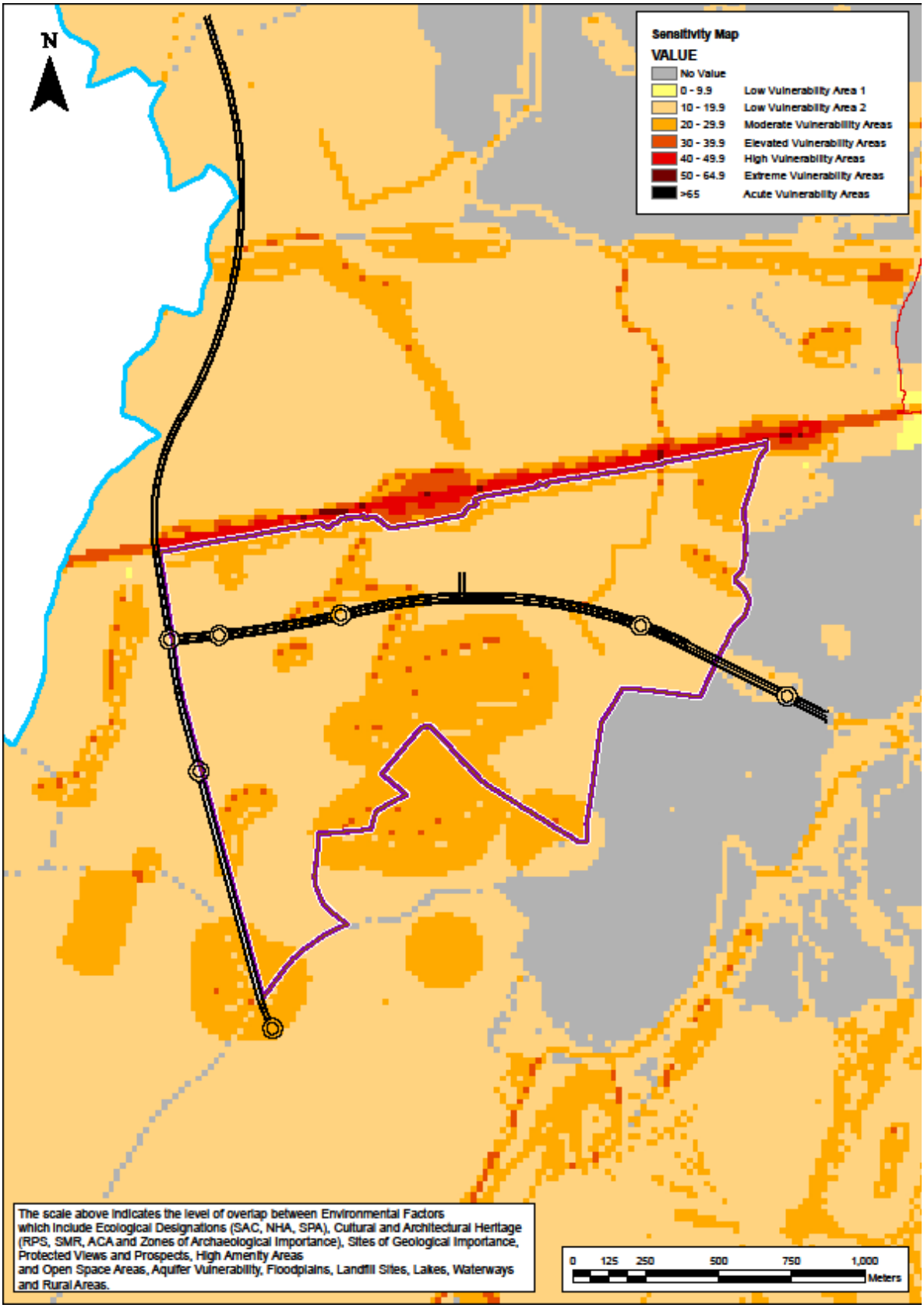
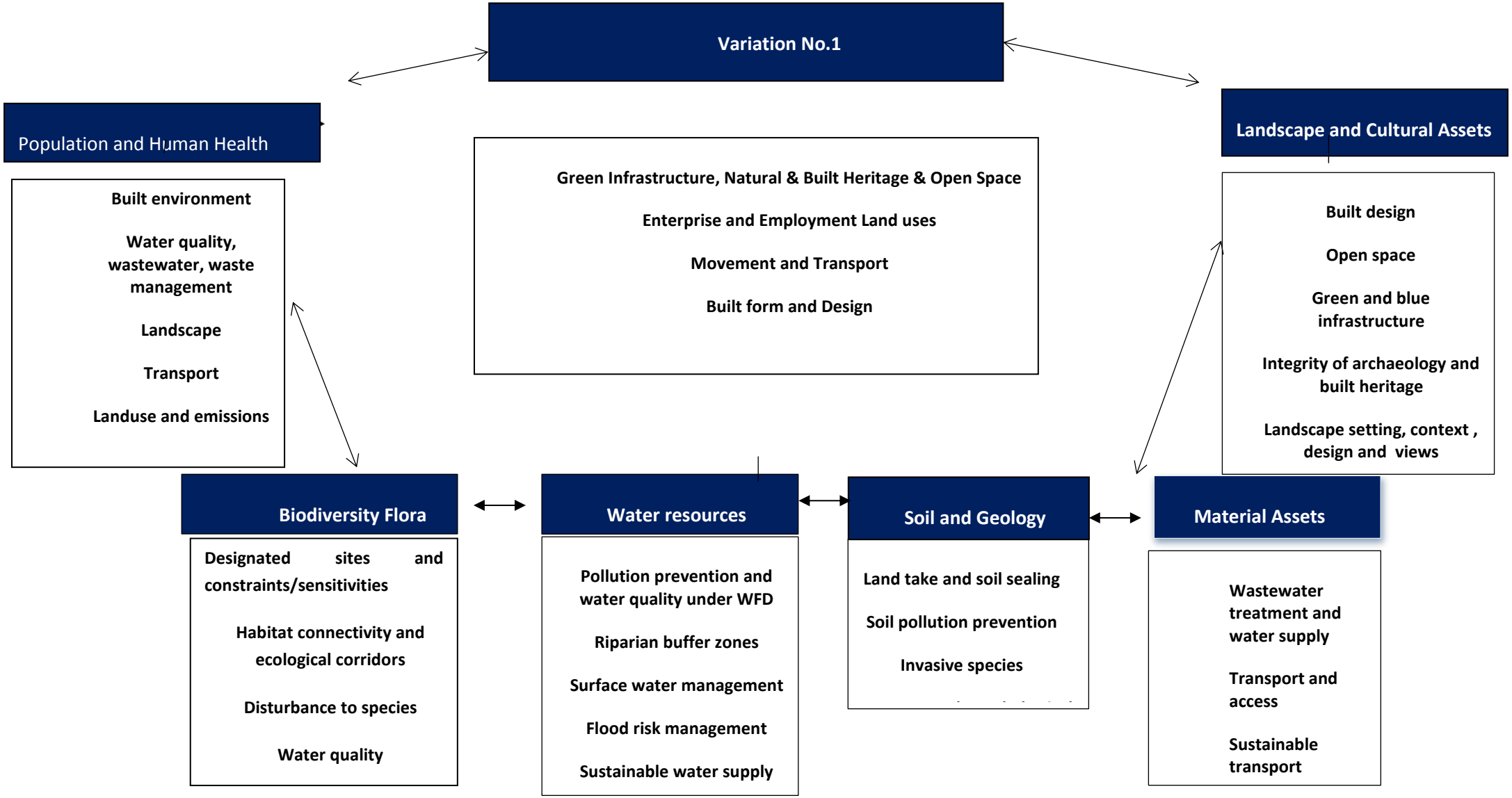


Figure 4.14 Environmental Sensitivity Mapping Proposed Variation Lands

Figure 4.15 PRIMARY ENVIRONMENTAL INTER-RELATIONSHIPS



5.0 SEA OBJECTIVES

5.1 Introduction

This overall aim of the SEA is to facilitate environmental protection and to allow the integration of environmental considerations into the preparation and implementation of the Variation No. 1 To that end, the SEA process assesses the proposed variation as it evolves in terms of its environmental impacts, positive, negative, neutral, cumulative and synergistic and also in terms of duration i.e. short, medium, long term, temporary, permanent, and secondary effects. This process highlights how improvements can be integrated into the proposed variation to increase its environmental performance and maintain environmental resources. The purpose of the SEA Objectives is to ensure that the assessment process is transparent and robust and that the Variation considers and addresses potential environmental effects.

These SEA Objectives are presented in this chapter and are developed into a monitoring programme in the form of targets and indicators which are presented in more detail in Chapter Nine Monitoring Programme. To facilitate consistency with the primary landuse plan for the County and reflect data gathering requirements, these SEOs reflect where possible the SEOs developed for the SEA of the South Dublin CDP 2016-2022. Where necessary the SEOs are adapted to reflect particular environmental considerations for this proposed variation. Where they differ from the South Dublin CDP 2016-2022 objectives, the text is shown in italic bold font. The results of this will be summarized in a table, called an evaluation matrix.

The Proposed Strategic Environmental Objectives are as follows:

Table 5.1 *STRATEGIC ENVIRONMENTAL OBJECTIVES*

SEA Topic		Strategic Environmental Objectives
Biodiversity Flora and Fauna	BFF1	To avoid loss of habitats, geological features, species or their sustaining resources in designated ecological sites.
	BFF2	To avoid significant adverse impacts, including direct, cumulative and indirect impacts, to habitats, geological features, species or their sustaining resources in designated ecological sites by development within or adjacent to these sites.
	BFF3	To sustain, enhance or - where relevant - prevent the loss of ecological networks or parts thereof which provide significant connectivity between areas of local biodiversity.
Population and human health Noise	PHH1	To protect human health from hazards or nuisances arising from traffic and incompatible landuses specifically noise, air pollution and water pollution.
Water	W1	To maintain and improve, where possible, the quality of rivers, lakes and surface water.
	W2	To prevent pollution and contamination of ground water.
	W3	To prevent development on lands which pose - or are likely to pose in the future – a significant flood risk.
Soil and Geology	SG1	To conserve soil resources where possible.
Material Assets	M1	To maintain and improve the quality of drinking water supplies.
	M2	To serve new development under the CDP with appropriate waste water treatment.
	M3	To reduce car dependency by way of, inter alia, encouraging modal change from car to more sustainable forms of public transport and encouraging development which will not be dependent on private transport.
	M4	To minimise waste production and reduce the volume of waste to landfill and to operate sustainable waste management practices.
Climate Change, Air Quality and Noise (Population and Human Health SEO address noise and air quality)	CC1	To minimise increases in travel related greenhouse emissions to air.
Cultural Heritage	CH1	To protect the archaeological heritage of South Dublin with regard to entries to the Record of Monuments and Places - including Zones of Archaeological Potential - and the context of the above within the surrounding landscape where relevant.

SEA Topic		Strategic Environmental Objectives
	CH2	To preserve and protect the special interest and character of architectural heritage with regard to entries to the Record of Protected Structures, Architectural Conservation Areas, and their context within the surrounding landscape where relevant.
Landscape	L1	To protect and avoid significant adverse impacts on the landscape, landscape features and designated scenic routes; especially with regard to areas of high amenity the Dublin Mountains Area, and the Liffey and Dodder Valleys.
Climate change adaptation	CC1	***To integrate climate change adaptation to the Variation***

6.0 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

6.1 Introduction

In the SEA ER of the SDCDP 2016-2022 of the specific local area objective for these lands, the following impacts were identified as being conflicting with the SEOS, and unlikely to be mitigated. Therefore a particular focus is given to the following parameters at this scale and level of assessment to identify these impacts in more detail and to provide where possible, mitigation measures in Chapter 8.

Probable Conflict with status of SEOs- Unlikely to be mitigated

B1: To avoid loss of habitats, geological features, species or their sustaining resources in designated ecological sites

B2: To avoid significant adverse impacts, including direct, cumulative and indirect impacts, to habitats, geological features, species or their sustaining resources in designated ecological sites by development within or adjacent to these sites

B3: To sustain, enhance or - where relevant - prevent the loss of the County's primary ecological corridors or parts thereof which provide significant connectivity

HH1: To protect human health from hazards or nuisances arising from traffic and incompatible land-uses

C1: To minimise increases in travel related greenhouse emissions to air

C2: To reduce car dependency within the County by way of, inter alia, encouraging modal change from car to more sustainable forms of public transport and encouraging development which will not be dependent on private transport

L1: To avoid significant adverse impacts on the landscape, landscape features and designated scenic routes; especially with regard to areas of high amenity, the Dublin Mountains Area, and the Liffey and Dodder Valleys

Table 6.1 Assessment of Likely Significant Effects

Variation No: 1	To rezone 193.47ha from RU To protect and improve rural amenity and provide for the development of agriculture to Enterprise and Employment: To provide for enterprise and employment related uses

Key Environmental Considerations

- **Adjacent to the Grand Canal pNHA southern boundary and towpath**
- **Habitat associated with Grand Canal significant ecological corridor for a number of species including bat, birds, otter and fish.**
- **Lucan Stream runs through site, with Griffeen River to the South**
- **Ultimately joins the River Liffey with hydrological links to Dublin Bay**
- **Habitats primarily agricultural land largely under tillage use**
- **Network of variety of hedgerows and treelines that provide ecological connectivity.**
- **Existing road network capacity and public transport options**
- **Dispersed residential settlement on fringes of lands**
- **Peamount Hospital a sensitive receptor for noise, landscape, cultural heritage.**
- **Grand Canal identified as a Noise sensitive receptor also**

↑ Likely to create positive effects on status of SEOs	⇳ Negative effects on status of SEOs - likely to be mitigated	↓ Negative effects on status of SEOs - unlikely to be fully mitigated ?
PH1	All other SEOS	

Discussion Summary of Impacts

Biodiversity, Flora and Fauna:
In terms of predicted specific impacts if the land is rezoned, the following points are of note:

There will be a loss of agricultural, arable and tilled land due to any rezoning and development. These habitats are of low ecological value and their loss will not represent a significant negative effect to the local ecology. There will be a potential loss of woodland habitats to the footprint of future development within the lands. This will have the potential to result in fragmentation and the loss of habitat and commuting corridors for a range of wildlife including protected mammal and bird species. Measures that seek to retain and where necessary replace existing linear woodland corridors will be required.
In the absence of a sensitive design approach there will be potential for disturbance to the Grand Canal pNHA and the ecological sensitive area along the canal to the north of the Variation Lands. Disturbance may occur as a result of an increased presence of people in this area of the canal and as a result of noise and light emissions to this sensitive area during the construction and operation of future developments. Measures will be required to be implemented at the planning and licencing phase to ensure that such emissions are abated to level that will avoid significant disturbance to these areas. Semi-natural habitats occurring along the canal corridor will be sensitive to industrial activities should they result in air emissions from industrial stacks associated with the activities and from additional traffic volumes that may arise. Planning conditions and potential Environmental Protection Agency (EPA) granted Industrial Emissions

Variation No: 1	To rezone 193.47ha from RU To protect and improve rural amenity and provide for the development of agriculture to Enterprise and Employment: To provide for enterprise and employment related uses

(IED) or Integrated Pollution Control (IPC) licences for industry to be located in Grangecastle west will control any potential significant air emissions.
In the absence of a sensitive approach to the construction and operation of future developments there will potential for perturbations to water quality in the Coldflow/Lucan Stream, the Griffeen River and further downstream in the River Liffey and the Liffey Valley pNHA.
In absence of appropriate control measures the construction phase of future developments will have the potential to result in the spread of invasive species within and surrounding the Variation Lands
Mitigation Measures are recommended

Population and Human health
Positive impacts identified for population and human health associated with increased economic activity and employment opportunity
The proposed rezoning of the lands for industrial use will have a variety of effects on human health. It should be noted that the type of industry that may locate in the area will dictate the type and significance of effects.
Whilst application of standard development management and control including IPPC licensing should ensure appropriate levels of protection for population and human health, potential impacts may arise in relation to noise, light and air quality associated with intensification of landuse activities.
It is expected there would be a positive, long term and moderate effect on employment as a result of any future industry locating in the area. Employment would likely be provided to some people in the surrounding areas, but employment opportunities would also be accessed by people who live in the Greater Dublin Area and Kildare County.

- **The potential future design and layout of the proposed rezoned lands could incorporate access for employees to the Grand Canal Way. This would allow employees to run/walk during lunch break, facilitating exercise, access to a quiet area and promoting general health benefits. This would provide a long term, moderate effect on human health and well-being. Increasing access to the Grand Canal would be considered in light of ecological considerations including increasing human disturbance and lighting. Mitigation Measures recommended.**

- **Potential industrial activities may lead to air emissions from industrial stacks associated with the activities and from additional traffic volumes that may arise. Planning conditions and potential Environmental Protection Agency (EPA) granted Industrial Emissions (IED) or Integrated Pollution Control (IPC) licences for industry to be located in Grangecastle west will control any potential significant air emissions.**

- **Potential industrial activities may lead to noise emissions from industrial activity and from additional traffic volumes that may arise. Additional employment in this area is likely to generate additional traffic volumes, particularly as the area which is currently greenfield is not serviced by public transport. Adamstown train station is the nearest station, but would not be considered**

Variation No: 1	To rezone 193.47ha from RU To protect and improve rural amenity and provide for the development of agriculture to Enterprise and Employment: To provide for enterprise and employment related uses

a convenient walking distance from the proposed site. The Peamont Hospital is located immediately to the south of the proposed site, and there are a small number of residences close by which would be considered sensitive receptors with regard to noise emissions. Compliance with Irish legislation, planning conditions and potential IED/IPC licences will ensure the effect of noise emissions from industrial activity and traffic on human health, in particular with regard to the sensitive receptors, would not be significant.

- **With capacity issues at Ringsend WWTP, additional potential pollutant loading from potential waste water discharge at the proposed rezoned lands could lead to negative impacts on environmentally sensitive sites adjacent to the WWTP. Plans are in place by Irish Water for an upgrade of the Ringsend WWTP and for an additional WWTP in North County Dublin. Suitable municipal wastewater treatment would be required to be in place to facilitate the location of industrial activities which generate wastewater at the proposed rezoned lands.**

Mitigation Measures are recommended.

Lands, Soil and Geology
In terms of predicted specific impacts if the land is rezoned, the following points are of note:

- **There will be a loss of agricultural soil due to any rezoning and development.**
- **Increased hardstand due to redevelopment will result in reduced recharge to ground locally. This will in turn increase run-off to surface water. This can result in a slight reduction in the local groundwater level**

- **Landscaping for redevelopment can result in a loss or gain of soil cover. Management of this is required to minimise encroachment by invasive species in imported soil, increase in aquifer vulnerability due to loss of soil, and correct disposal or remediation of any waste soils encountered.**

Development on the greenfield site would result in permanent loss and sealing of soil in this area. Potential risks associated with introduction of alien and invasive species associated with site clearance and construction works.
Mitigation Measures recommended.

Water including Flooding
Negative impacts could arise in relation to emissions to water associated with development including increased run off and poor attenuation. This would require assessment and mitigation at project level.
Although bulk storage of any chemicals will generally be managed under licensing (EPA) and permitting, there will be an increase in the potential for accidental release of contaminants to ground.
- **Increased hardstand due to redevelopment will result in an increase in run-off which will require mitigation to avoid flood impact.**

Variation No: 1	To rezone 193.47ha from RU To protect and improve rural amenity and provide for the development of agriculture to Enterprise and Employment: To provide for enterprise and employment related uses

- **Development can have an impact on connectivity between water bodies unless adequately considered in design**

  - **Should wastewater treatment capacity require addressing, emissions to the river itself would need assessment and monitoring.**

Climate Change, Air Quality and Noise

The proposed rezoning of the lands for industrial use has the potential to increase greenhouse gas emissions in the absence of mitigation. It should be noted that the type of industry and the number and type of transport that may be located in the area will dictate the type and significance of the effects.

The rezoning of the lands for industrial use is likely to lead to the need for construction of buildings and roadways in the zone. However, with effective implementation of construction management plans for each phase of any development, the proposed construction-related greenhouse gas emissions is expected to be negligible.

Potential industrial activities may lead to increased traffic along the adjoining roads and, depending on the type of industry, lead to greenhouse gas emissions from industrial stacks associated with the activities. However, any proposed industrial facility will be required to obtain planning permission and may be required to undertake an Environmental Impact Assessment Report (EIAR) and/or obtain a permit from the EPA (Greenhouse Gas Permit as per Council Directive 2009/29/EC "the (revised) EU Emission Trading Scheme (EU ETS)") prior to operation.

Vehicle emissions associated with the development of the proposed rezoned lands will give rise to CO2 and N2O emissions in the region. Furthermore, emissions from space heating in commercial and residential units will also contribute to national emissions of greenhouse gases.

Air Quality

The proposed rezoning of the lands for industrial use has the potential to impact on ambient air quality and human health in the absence of mitigation. It should be noted that the type of industry and the number and type of transport that may locate in the area will dictate the type and significance of the effects.

Again depending the scale envisaged any increase in emissions to air arising from development eg: sulphur dioxide would require more detailed assessment at project level.

Mitigation Measures recommended

Cultural Heritage

There are three specific areas of archaeological sensitivity within the Grange Castle Western Lands (Figure 2), SMR site DU017-095 (enclosure), a previously unknown cemetery site, and six areas of archaeological potential (AP 1 to AP 6).

The existing recorded sites and monuments, the rich medieval history of the area, and the extensive subsurface archaeological remains that have been uncovered to the east and northeast of the Grange Castle Western Lands, all indicate the high archaeological potential of this entire

Variation No: 1	To rezone 193.47ha from RU To protect and improve rural amenity and provide for the development of agriculture to Enterprise and Employment: To provide for enterprise and employment related uses

region and the likelihood of further material turning up wherever the ground is disturbed by development.

- **Architectural Heritage**

There are no known architectural heritage constraints within the Grange Castle Western Lands, though the Grand Canal and its associated structures and the complex at Peamount Hospital are located on the periphery of the lands. More detailed assessment may identify undesignated built heritage sites within the lands. Cultural heritage impacts are likely to be sufficiently addresses through the planning and development management system and archaeological impact assessments.

Landscape

Given the proximity of these lands to the Grange Castle Business Park the rural character is diluted somewhat with building associated with the Business Park comprising views particularly towards the east. Notwithstanding this, the primary landuse currently being agricultural, the conversation to Enterprise and Employment represents a significant, permanent change in landscape character.

The visual relationship and connections to the Grand Canal and intermittent views to the Dublin mountains are important contributors to local landscape character.

The generally lowlying and flat topography of the area means tall structures may be visible over quite large areas.

The screening and ecosystem services provided by existing vegetation particularly mature hedgerows and treelines merit retention.

Mitigation measures are recommended.

Material Assets

Again depending on the type of development, services such as wastewater or water supplies would be required in advance of any development.

Changing landuse to more intensive activities associated with Enterprise and Employment will likely give rise to increased traffic and transport considerations. In the absence of mitigation, this could be a long term adverse effect with related effects identified for noise and air quality.

Consideration of how any new service provision would impact on the capacity of the existing and planned waste and wastewater infrastructure.

6.2 Cumulative and In-Combination Effects

The interrelationships between environmental parameters and how they interact with each other is complex and variable. Notwithstanding that, clear relationships can be seen between water resources and a number of other parameters which serves to signify yet again the importance of water quality management and monitoring.

The relationship between biodiversity, soil and water is complex but critical. Given the landuse changes proposed under Variation No.1, emissions associated with noise, air quality and light are important issues to consider. In-combination these can create adverse, long term effects on a number of mammals associated with the Grand Canal including bats and otters. Long

term adverse effects are also possible in relation to impacts on human health arising from in –combination effects.

As part of the assessment of cumulative impacts in terms of the variation and the existing SDCDP2016-2022, the existing policies and objectives of the plan were assessed to see if they could give rise to effects in combination with the variation.

Potential projects have also been identified that could give rise to in-combination effects. These include:

- cumulative impacts of the greenway, or other projects such as the Griffeen Valley cycleway extension
- development of the Grange Castle Business Park, and
- the proposed re-construction of the R120 road bridge over the Grand Canal on the western under a part 8 scheme agreed by South Dublin County Council in 2012
- the approved Eirgrid West Dublin Project

Table 6.2 Potential cumulative and in combination effects

Plan	Comment	Cumulative effects
The Transport Strategy for the Greater Dublin Area, 2016-2035	This Strategy sets out how transport will be developed across the region, covering Dublin, Meath, Wicklow and Kildare, over the period of the strategy and was subject to SEA and AA.	No in combination effects are identified.
Water Services Strategic Plan	Ireland's first integrated national plan for the delivery of water services, the Water Services Strategic Plan (WSSP) addresses six key themes and was adopted in 2015. It was subject to full SEA and AA and concluded that Overall, the assessment has identified that the implementation of the draft WSSP is likely to have positive effects on the majority of the SEOs that have been used in the assessment to help characterise the environmental effects of the WSSP and no significant negative effects were identified.	No in-combination impacts were predicted as a result of implementation of the Plans
Neighbouring County Development Plans	These plans were subject to full SEA and AA and concluded that subject to full adherence and implementation of measures likely significant effects were not identified.	No in-combination impacts were predicted as a result of implementation of the Plans
River Basin District	The second cycle of these plans (2015 to 2021) are currently in preparation and will provide management measures to achieve WFD	No in-combination impacts are predicted as a result of

Plan	Comment	Cumulative effects
Management Plans.	Objectives up to 2021. This plan is undergoing both SEA and AA and is in draft form.	implementation of the Plans
CFRAMS Study	The Eastern CFRAM study has been commissioned in order to meet the requirements of the Floods Directive, as well as to deliver on core components of the 2004 National Flood Policy, in the Eastern district.	Mitigation measures are recommended in relation to flood risk and surface water. Subject to implementation of same, no adverse effects identified.
Projects		
Grand Canal Greenway	The Grand Canal Greenway from the 3rd to 12th Lock was opened in 2010. The greenway runs along the southern towpath in and around the subject lands, although the Greenway terminates at the 12th Lock which comprise the eastern corner of the Variation lands.	The potential for cumulative and in combination effects relate to the pNHA of the Grand Canal associated with increased recreational use along the towpath and disturbance to sensitive species particularly around lighting and human presence. It is recommended that mitigation measures be provided to avoid in combination effects in this area.
Grange Castle Business Park	1999-2000 – The early 2000s saw the start of expansion of the original footprint of the Park to its current scale of in excess of 500acres. The servicing of the land bank intensified with surface water attenuation being addressed through the Griffeen River Valley Scheme and the provision of other key service platforms such as the internal road network and gas, electricity and telecoms in the Park. This highly serviced land-bank enabled the IDA to commencing marketing the Park, alongside the Council, to an international audience	Semi-natural habitats occurring along the canal corridor will be sensitive to industrial activities should they result in air emissions from industrial stacks associated with the activities and from additional traffic volumes that may arise. Planning conditions and potential Environmental Protection Agency (EPA) granted Industrial Emissions (IED) or

Plan	Comment	Cumulative effects
		Integrated Pollution Control (IPC) licences for industry to be located in Grangecastle west will control any potential significant air emissions.
Road realignment of R120	This road realignment of the R120 is proposed to commence on site imminently. This project includes the upgrade of the existing 12th Lock Bridge over the Grand Canal.	No in combination effects are identified
Pedestrian Bridge over Grand Canal	This 'red bridge' was constructed in 2011 and facilitates pedestrian access over the Grand Canal to the Griffeen Valley Park.	No in combination effects are identified
Western Orbital Route	The proposed road will facilitate significant car based movements, both into and through the county, The road will traverse agricultural land in the predominantly rural western hinterland of the county, impacting upon the river Griffeen and tributaries, the Tobermaclugg Stream and other wet ditches, hedgerows and tree lines, in addition to changing the character or the rural landscape. The proposal traverses the Grand Canal, and would impact severely upon the historic and landscape character of the Canal as well as upon associated banks, hedgerows and tow-paths which comprise one of the most significant biodiversity corridors in the county and region. A requirement to assess the need for this road should be undertaken prior to route selection, which will also undergo assessment of various routes in addition to mitigation for biodiversity, landscape and the Grand Canal	The construction of this road could create long term adverse environmental effects and lead to effects as identified in the comment column which is extracted from the SEA ER of the SDCDP 2016-2022.
Eirgrid Dublin West Project	Planning approval has been granted for an Eirgrid Dublin West Project. This project will involve the provision of a substation, two separate interface compound locations and specific circuit routes in the Grange Castle area of West Dublin. The footprint of the project will be located to the east and north of the Variation Lands. During the assessment of this project it	Subject to the implementation of mitigation measures there should be no potential for cumulative in-combination effects with this project.

Plan	Comment	Cumulative effects
	was concluded that, provided all mitigation measures are implemented, it would not have the potential to result in likely significant effects to the receiving environment	
	Irish Water have proposed that the Shannon to Dublin Water Scheme will land within close proximity of the existing Peamount Reservoir site. An extension to the existing Peamount Reservoir is proposed as part of this scheme	The route will be going south of the subject lands and extend the existing reservoir at Peamount. At this juncture no combination effects are identified.

7.0 CONSIDERATION OF ALTERNATIVES FOR PROPOSED VARIATION

7.1 Introduction

The preparation of policies and objectives affecting a geographical area such as at Grange Castle presents a significant opportunity to affect the way development and physical change occurs, where it materialises and the nature of that process. The SEA process seeks to outline the development process where key decisions are reached, and consider the environmental impacts of the policy path chosen.

The examination of alternative options of attaining the strategic objectives of the draft Variation, in the first instance acknowledges the challenges of why the draft Variation choses one course over another.

The evaluation of the likely environmental consequences of a range of alternative strategies for accommodating future development in the South Dublin area is part of the SEA process.

Article 5 of the SEA Directive requires the Environmental Report to consider *"reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme"* and the significant environmental effects of the alternatives selected.

These alternative strategies must be realistic, capable of implementation, and should represent a range of different approaches within the statutory and operational requirements of the particular plan. In some cases the preferred strategy will combine elements from the various alternatives considered.

One of the critical roles of the SEA in relation to the draft variation is to facilitate an evaluation of the likely environmental consequences of a range of alternative development scenarios, in this case the proposed variation to the South Dublin Development Plan relating to the lands at Grange Castle west.

These alternative development scenarios should meet the following considerations:

- Take into account the geographical scope, hierarchy and objectives of the plan –be realistic
- Be based on socio-economic and environmental evidence – be reasonable
- Be capable of being delivered within the plan timeframe and resources –be implementable
- Be technically and institutionally feasible – be viable

This section identifies and describes different Variation scenarios, taking into account higher level strategic actions as well as the geographical scope of South Dublin County Council's administrative boundary.

7.2 Identification and description of alternative scenarios

The following summarises a series of alternative *'Scenarios'* which provide alternative visions of how the future development of the lands may occur. These are neither predictions nor preferences - instead they offer a range of plausible and internally consistent narratives of the outcome of different planning and development strategies, and are considered to be consistent with the over-arching scenarios outlined in the County Development Plan. The scenarios provide the basis for the comparative evaluation of the likely environmental effects of each plan, which in turn serves the purpose of identifying which features of plans and policies are likely to be sensitive or robust over the widest range of circumstances.

The scenarios are derived taking into account higher level strategic plans as well as the geographical scope of the area. The Regional Planning Guidelines for the Greater Dublin Area 2010-2022 (RPG-GDA) provide an overall strategic settlement context for the Development Plans of each local authority in the GDA. The RPG's seek

sustainable economic growth across the GDA, through the promotion of identified core economic areas across the GDA in both the Dublin and Mid East Regions to facilitate new employment opportunities for existing populations and seek to reduce the volume of unsustainable long distance commuting.

7.3 Reasons for selecting the alternatives

The purpose of the draft Variation is part of the review of the zoning of lands required under **Policy ET3 SLO1** of the South Dublin County Development Plan which seeks to conduct a review of the zoning of lands to the south of the Grand Canal with a view to preparing a long term plan for the expansion of the Grange Castle Economic and Enterprise Zone to the area.

Policy ET3 SLO1 seeks:-

"To conduct a review of the zoning of lands south of the Grand Canal and west and north of the R120, including lands adjoining Peamount Healthcare, with a view to preparing a long term plan for the expansion of the Grange Castle Economic and Enterprise Zone to this area, to accommodate strategic investment in the future, while also seeking to provide public open space along the Canal, including a natural heritage area in the vicinity of the historic canal quarries at Gollierstown."

The team developed three alternative scenarios relating to the draft variation and are not predictions or preferences; instead they offer a range of outcomes arising from different planning and development strategies. These scenarios form the basis for comparative evaluation of the likely environmental effects of these reasonable alternatives in respect of the draft variation.

7.4 ALTERNATIVES CONSIDERED

It is important to note that the alternatives considered for the proposed draft variation are consistent with the broad principles of the Strategic Environmental Assessment of the adopted South Dublin County Development Plan 2016-2022 in respect of the alternatives considered.

The three alternatives are as follows:-

- Scenario 1: Environmental /Preservation Approach (leaving the subject lands in agricultural use)

- Scenario 2 Sustainable/Selective and Sequential Approach (Note: this is the proposed variation)
- Scenario 3 – Weak Planning / Market-led Approach

Summary Evaluation against SEOs

Scenario 1: Scenario 1: Environmental /Preservation Approach (leaving the subject lands in agricultural use)

Likely to create positive effects on status of SEOs	Negative effects on status of SEOs - likely to be mitigated	Negative effects on status of SEOs - unlikely to be fully mitigated
SG1 PHH1 W2 M1, M2 BFF1 -3	W1 CH1 L1	M3
This scenario would entail leaving the subject lands in agricultural use and would adopt a cautious and restrained approach to new employment development and prioritises the protection of South Dublin's natural environment together with the amenity and character of existing residential areas. It envisages the consolidation of existing employment lands. This scenario would involve the adoption of planning policies which seek to consolidate and restrict large scale industrial development to the existing footprint of employment zoned lands. While Scenario 1, leaving the lands with their agricultural use, does give rise to the least short term direct, negative environmental effects, in the medium to long-term significant negative indirect impacts may also arise as employment lands within South Dublin are displaced to more distant areas within the Greater Dublin Area, which would be located further away from the existing and future population centres in South Dublin such as Lucan and Clondalkin/Tallaght and future areas such as the Clonburris SDZ. The result of this would be increases in unsustainable traffic patterns as well as associated noise, and emissions as employment lands would be located further from employment lands. The requirement of Pharma/Bio-sciences Foreign Direct Investment firms is for large scale sites which would be built out over an extended period (c. 20 years). While consolidation of the current stock of floorspace in South Dublin is desirable, there is recognition that site specific requirements of large scale investment will not be capable of being accommodated in the existing EE zoned lands within South Dublin due to space requirements. Scenario 1 would also not take advantage of the significant infrastructural investment including rail and road upgrades in the area which will facilitate the managed sustainable development of the lands over an extended period.		

Scenario 2: Sustainable/Selective and Sequential Approach (Note: this is the Proposed Variation)

Likely to create positive effects on SEOs	Negative effects on status of SEOs - likely to be mitigated	Negative effects on status of SEOs - unlikely to be fully mitigated
BF1, 2 PHH1 W1, 2 3	M2,3,CCAN 1,2 CH1,CH2, L1	
This scenario seeks to expand the existing employment zoned lands in a sequential manner from existing employment zoned lands in proximity to public transport. The discrete expansion would allow for the protection of the wider natural environment.		

Likely to create positive effects on SEOs	Negative effects on status of SEOs - likely to be mitigated	Negative effects on status of SEOs - unlikely to be fully mitigated
In this scenario the components of sustainable development – economic development, social well-being, environmental protection and enhancement, and resource conservation are integrated in the proposed variation to the Plan. Allowance is made in this scenario for some trade-off between development and environmental protection with mitigation measures ameliorating any negative environmental impacts. Any sites which are the subject of European Directive or National designations would be very carefully managed to ensure that their conservation value is maintained and not undermined or threatened by development. Scenario 2 (the proposed variation) is more likely to bring about better environmental outcomes because of its ability to bring about both controlled growth and the necessary growth to capitalise important environmental mitigation measures.		

Scenario 3: Weak Planning / Market-led Approach

Likely to create positive effects on status of SEOs	Negative effects on status of SEOs - likely to be mitigated	Negative effects on status of SEOs - unlikely to be fully mitigated
	All SEOs	BFF2 W1SG1
This Scenario would be characterised by a weak planning approach to development within the subject lands with a flexible overall development strategy and an emphasis on market-led growth and maximising growth with a relaxed and greater ad-hoc interpretation of policy and guidance. The land use proposals associated with the rezoning of lands would be assessed against policies of the SDCDP 2016-2022 but particular environmental sensitivities not necessarily governed by statutory provision would not be considered in this scenario. The more ad-hoc approach would likely give rise to indirect, and cumulative effects particularly as regards biodiversity, lost opportunities to design in and accommodate green infrastructure elements such as hedgerows, as well as landscaping opportunities. No or insufficient buffer areas for the Grand Canal southern area would be provided for this in scenario, and again adverse effects may arise in relation to increased disturbance, lighting and activity in and around the Grand Canal area. The advantages of South Dublin being part of the Greater Metropolitan Area would be fully exploited, taking advantage of the large market place and labour force. However, it is likely that there would be little correlation between people's homes and people's places of employment. Furthermore, consideration of alignment of public transport opportunities with the adjacent existing Grange Castle may not arise under this Scenario. In summary, Scenario 3, which includes the accommodation of major development on an ad hoc basis on Greenfield lands throughout the county, would result in a range of environmental conflicts including biodiversity, water quality, landscape character and climate		

Likely to create positive effects on status of SEOs	Negative effects on status of SEOs - likely to be mitigated	Negative effects on status of SEOs - unlikely to be fully mitigated
change (an increase in the number of unsustainable traffic patterns due to dispersed with a decrease in public transport journeys giving rise to the production of greenhouse gases).		

7.5 Preferred Alternative

From the SEA perspective the preferred alternative (Scenario 2) provides the following:

- Considers an appropriate setback for all buildings from the southern side of the Grand Canal, to afford the optimal degree of protection to the Grand Canal ecological corridor.
- Could allow for the retention of high value hedgerows and incorporation within a wider SUDs scheme.
- Utilises existing and proposed infrastructure and is adjacent to existing Grange Castle enterprise and employment uses

Therefore, the preferred alternative was developed having regard to the key requirements of:

- Environmental effects identified through the SEA consideration of alternatives, and
- Policy ET3 SLO1 of the SDCDP 2016-2022 "*To conduct a review of the zoning of lands south of the Grand Canal and west and north of the R120, including lands adjoining Peamount Healthcare, with a view to preparing a long term plan for the expansion of the Grange Castle Economic and Enterprise Zone to this area, to accommodate strategic investment in the future, while also seeking to provide public open space along the Canal, including a natural heritage area in the vicinity of the historic canal quarries at Gollierstown*."

By complying with appropriate mitigation measures, potential adverse environmental effects which could arise as a result of implementing this scenario would be likely to be avoided, reduced or offset.

8.0 MITIGATION MEASURES

8.1 Introduction

This chapter outlines the mitigation measures that will prevent, reduce, and offset as much as possible any significant adverse effects on the environment of the plan area resulting from the implementation of Proposed Variation No 1 of the SDCDP 2016-2022. Section (g) of Schedule 2B of the SEA Regulations (as amended) requires: *'The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the Plan'*.

Mitigation involves ameliorating significant negative effects. Where the environmental assessment identifies significant adverse effects, consideration is given in the first instance to preventing such impacts or where this is not possible, to lessening or offsetting those effects. Mitigation measures can be generally divided into those that:

- Avoid effects;
- Reduce the magnitude or extent, probability and/or severity of effect;
- Repair effects after they have occurred, and
- Compensate for effects, by balancing out negative impacts with positive ones.

The iterative process of the preparation of the proposed variation has facilitated the integration of environmental considerations into the proposed variation. In addition, potential positive effects of implementing the proposed variation have been and will be maximised and potential adverse effects have been and will be avoided, reduced or offset.

Many impacts will be more adequately identified and mitigated at project and EIA level. In general terms, all proposals for development will be required to have due regard to environmental considerations outlined in this Environmental Report and associated assessments including the Screening for Appropriate Assessment, Strategic Flood Risk Assessment and Ecology Surveys. Proposals for development which are deemed contrary to the environmental objectives contained in SDCDP 2016-2022 will not normally be permitted, and if permitted, not without the appropriate site and development specific mitigation measures.

Also the SEA ER of the SDCDP 2016-2020 assessed the Local Policy for these lands as giving rise to effects not likely to be mitigated at CDP level, these have formed a particular focus of mitigation measures in this chapter:

HH1 To protect human health from hazards or nuisances arising from traffic and incompatible land-uses

C1 To minimise increases in travel related greenhouse emissions to air

C2 To reduce car dependency within the County by way of, inter alia, encouraging modal change from car to more sustainable forms of public transport and encouraging development which will not be dependent on private transport

L1 SEO L1: To avoid significant adverse impacts on the landscape, landscape features and designated scenic routes; especially with regard to areas of high amenity, the Dublin Mountains Area, and the Liffey and Dodder Valleys

B1 To avoid loss of habitats, geological features, species or their sustaining resources in designated ecological sites

B2 To avoid significant adverse impacts, including direct, cumulative and indirect impacts, to habitats, geological features, species or their sustaining resources in designated ecological sites by development within or adjacent to these sites

B3 To sustain, enhance or - where relevant - prevent the loss of the County's primary ecological corridors or parts thereof which provide significant connectivity

This chapter is structured as follows:

- 8.2 Environmental Protection Measures in the South Dublin County Development Plan 2016-2022
- 8.3 Mitigation measures –amendment of text in
- 8.4 Specific mitigation measures developed through the SEA and associated assessments and surveys.

8.2 Environmental Protection Measures in the South Dublin CDP 2016-2022

CDP Policy/Objective	Text
Population and Human health	
Housing(h) Policy 12	Public Open Space It is the policy of the Council to ensure that all residential development is served by a clear hierarchy and network of high quality public open spaces that provides for active and passive recreation and enhances the visual character, identity and amenity of the area.
Policy C1	It is the policy of the Council to ensure that all communities have access to multifunctional community centres that provide a focal point for community activities.
Policy C8 (a)	It is the policy of the Council to support and facilitate the provision of good quality and accessible childcare facilities at suitable locations in the County
Policy C8 (b)	It is the policy of the Council to require the provision of new childcare facilities in tandem with the delivery of new communities.
Policy 13	It is the policy of the Council to promote the highest levels of universal accessibility in all community facilities
Policy 12	It is the policy of the Council that a hierarchical network of high quality open space is available to those who live, work and visit the County, providing for both passive and active recreation, and that the resource offered by public open spaces, parks and playing fields is maximised through effective management

CDP Policy/Objective	Text
Biodiversity, Flora and Fauna	
Heritage, conservation and landscapes (HCL) policy 12 natura 2000 sites	It is the policy of the Council to support the conservation and improvement of Natura 2000 Sites and to protect the Natura 2000 network from any plans and projects that are likely to have a significant effect on the coherence or integrity of a Natura 2000 Site
Heritage, conservation and landscapes (HCL) policy 13	Natural Heritage Areas It is the policy of the Council to protect the ecological, visual, recreational, environmental and amenity value of the County's proposed Natural Heritage Areas and associated habitats.
Hcl13 objective 1:	To ensure that any proposal for development within or adjacent to a proposed Natural Heritage Area (pNHA) is designed and sited to minimise its impact on the biodiversity, ecological, geological and landscape value of the pNHA particularly plant and animal species listed under the Wildlife Acts and the Habitats and Birds Directive including their habitats.
HCL13 objective 2:	To restrict development within a proposed Natural Heritage Area to development that is directly related to the area's amenity potential subject to the protection and enhancement of natural heritage and visual amenities including biodiversity and landscapes
Heritage, conservation and landscapes (HCL) policy 15	Non-Designated Areas It is the policy of the Council to protect and promote the conservation of biodiversity outside of designated areas and to ensure that species and habitats that are protected under the Wildlife Acts 1976 and 2000, the Birds Directive 1979 and the Habitats Directive 1992 are adequately protected

CDP Policy/Objective	Text
HCL15 objective 1	To ensure that development does not have a significant adverse impact on rare and threatened species, including those protected under the Wildlife Acts 1976 and 2000, the Birds Directive 1979 and the Habitats Directive 1992.
HCL15 objective 2:	To ensure that, where evidence of species that are protected under the Wildlife Acts 1976 and 2000, the Birds Directive 1979 and the Habitats Directive 1992 exists, appropriate avoidance and mitigation measures are incorporated into development proposals as part of any ecological impact assessment.
HCL15 objective 3	To protect existing trees, hedgerows, and woodlands which are of amenity or biodiversity value and/ or contribute to landscape character and ensure that proper provision is made for their protection and management in accordance with Living with Trees: South Dublin County Council's Tree Management Policy 2015-2020.
Material Assets -Transport	
Transport and mobility (tm) policy 1	Overarching It is the policy of the Council to promote the sustainable development of the County through the creation of an integrated transport network that services the needs of communities and businesses
Transport and mobility (tm) policy 2	Public Transport It is the policy of the Council to promote the sustainable development of the County by supporting and guiding national agencies in delivering major improvements to the public transport network and to ensure existing and planned public transport services provide an attractive and convenient alternative to the car.
Transport and Mobility (TM) Policy 3	Walking and Cycling It is the policy of the Council to re-balance movement priorities towards more sustainable modes of transportation by prioritising the development of walking and cycling facilities within a safe and traffic calmed street environment.

CDP Policy/Objective	Text
Transport and mobility (tm) policy 6	Road and Street Design It is the policy of Council to ensure that streets and roads within the County are designed to balance the needs of place and movement, to provide a safe traffic-calmed street environment, particularly in sensitive areas and where vulnerable users are present
Material Assets –Water and Wastewater	
Infrastructure & environmental quality (IE) policy 1 water & Wastewater	It is the policy of the Council to work in conjunction with Irish Water to protect existing water and drainage infrastructure and to promote investment in the water and drainage network to support environmental protection and facilitate the sustainable growth of the County.
IE1 objective 1	To work in conjunction with Irish Water to protect, manage and optimise water supply and foul drainage networks in the County.
IE1 objective 2:	To work in conjunction with Irish Water to facilitate the timely delivery of ongoing upgrades and the expansion of water supply and wastewater services to meet the future needs of the County and the Region
Water Resources including Flood Risk	
IE2 policy	It is the policy of the Council to manage surface water and to protect and enhance ground and surface water quality to meet the requirements of the EU Water Framework Directive

CDP Policy/Objective	Text
IE2 objective 1	To maintain, improve and enhance the environmental and ecological quality of our surface waters and groundwater by implementing the programme of measures set out in the Eastern River Basin District River Basin Management Plan
IE2 objective 2	To protect the regionally and locally important aquifers within the County from risk of pollution and ensure the satisfactory implementation of the South Dublin Groundwater Protection Scheme 2011, and groundwater source protection zones, where data has been made available by the Geological Survey of Ireland
IE2 objective 3	To maintain and enhance existing surface water drainage systems in the County and promote and facilitate the development of Sustainable Urban Drainage Systems (SUDS), including integrated constructed wetlands, at a local, district and County level, to control surface water outfall and protect water quality.
IE2 objective 4	To incorporate Sustainable Drainage at a site and/or district scale, including the potential for wetland facilities
IE2 objective 5	To limit surface water run-off from new developments through the use of Sustainable Urban Drainage Systems (SUDS) and avoid the use of underground attenuation and storage tanks
IE2 objective 6	To promote and support the retrofitting of Sustainable Urban Drainage Systems (SUDS) in established urban areas, including integrated constructed wetlands
Water Resources and Biodiversity, Flora and Fauna	
IE2 objective 8	To protect salmonid water courses, such as the Liffey and Dodder Rivers catchments (including Bohernabreena Reservoir), which are recognised to be exceptional in supporting salmonid fish species.

CDP Policy/Objective	Text
IE2 objective 9:	To protect water bodies and watercourses, including rivers, streams, associated undeveloped riparian strips, wetlands and natural floodplains, within the County from inappropriate development. This will include protection buffers in riverine and wetland areas as appropriate. (see also Objective G3 Objective 2 – Biodiversity Protection Zone
IE2 objective 11	To protect surface water quality by assessing the impact of domestic and industrial misconnections to the drainage network in the County and the associated impact on surface water quality, and by implementing measures to address same.
Infrastructure & environmental quality (IE) policy 3	Flood Risk It is the policy of the Council to continue to incorporate Flood Risk Management into the spatial planning of the County, to meet the requirements of the EU Floods Directive and the EU Water Framework Directive
Material Assets –Waste Management	
Infrastructure & environmental quality (IE) policy 5	Waste Management It is the policy of the Council to implement European Union, National and Regional waste and related environmental policy, legislation, guidance and codes of practice to improve management of material resources and wastes
IE5 objective 1	To support the implementation of the Eastern–Midlands Region Waste Management Plan 2015-2021 by adhering to overarching performance targets, policies and policy actions
IE5 objective 2	To support waste prevention through behavioural change activities to de-couple economic growth and resource use.

CDP Policy/Objective	Text
IE5 objective 3	To encourage the transition from a waste management economy to a green circular economy to enhance employment and increase the value recovery and recirculation of resources
IE5 objective 4	To provide, promote and facilitate high quality sustainable waste recovery and disposal infrastructure/ technology in keeping with the EU waste hierarchy and to adequately cater for a growing residential population and business sector
IE5 objective 5	To provide for and maintain the network of bring infrastructure (e.g. civic amenity facilities, bring banks) in the County to facilitate the recycling and recovery of hazardous and non-hazardous municipal wastes
IE5 objective 6	To seek the provision of adequately sized public recycling facilities in association with new commercial developments and in tandem with significant change of use/extensions of existing commercial developments where appropriate
IE5 objective 7	To develop a countywide network of green waste centres in suitable locations to expand the collection system for compostable waste
IE5 objective 8:	To secure appropriate provision for the sustainable management of waste within developments, including the provision of facilities for the storage, separation and collection of such waste
Soil and Geology	
IE2 objective 10	To require adequate and appropriate investigations to be carried out into the nature and extent of any soil and groundwater contamination and the risks associated with site development work, in particular for brownfield development

CDP Policy/Objective	Text
Heritage, conservation and landscapes (HCL) policy 19	Geological Sites It is the policy of the Council to maintain the conservation value and seek the sustainable management of the County's geological heritage resource.
HCL19 Objective 1:	To protect designated County Geological Sites from inappropriate development and to promote the importance of such sites through the County's Heritage Plan.
Air Quality, Noise, Population and Human health	
Infrastructure & environmental quality (IE) policy 7	Environmental Quality It is the policy of the Council to have regard to European Union, National and Regional policy relating to air quality, light pollution and noise pollution and to seek to take appropriate steps to reduce the effects of air, noise and light pollution on environmental quality and residential amenity.
IE7 objective 1	To implement the provisions of EU and National legislation on air, light and noise control and other relevant legislative requirements, as appropriate, in conjunction with all relevant stakeholders
IE7 objective	To implement the recommendations of the Dublin Regional Air Quality Management Plan to protect people from the harmful health effects associated with air pollution, to preserve good air quality where it exists and to improve air quality where it is unsatisfactory
IE7 objective 3:	To implement the relevant spatial planning recommendations and actions of the Dublin Agglomeration Environmental Noise Action Plan 2013 – 2018

CDP Policy/Objective	Text
IE7 objective 4	To ensure that future developments are designed and constructed to minimise noise disturbance and take into account the multi functional uses of streets including movement and recreation as detailed in the Urban Design Manual (2009) and the Design Manual for Urban Roads and Streets (2013).
IE7 objective 5	To ensure external lighting schemes minimise light spillage or pollution in the immediate surrounding environment and do not adversely impact on residential or visual amenity and biodiversity in the surrounding areas.
IE7 SLO 1	To provide noise barriers along the uncovered parts of Moy Glas estate facing the Grangecastle Road and 100 metres along Griffeen Avenue
Green Infrastructure, Biodiversity, Flora and Fauna, Water, Landscape, Population and Human health	
Green infrastructure (g) policy 1	Overarching It is the policy of the Council to protect, enhance and further develop a multifunctional Green Infrastructure network by building an interconnected network of parks, open spaces, hedgerows, grasslands, protected areas, and rivers and streams that provide a shared space for amenity and recreation, biodiversity protection, flood management and adaptation to climate change.
G1 objective 1	To establish a coherent, integrated and evolving Green Infrastructure network across South Dublin County with parks, open spaces, hedgerows, grasslands, protected areas, and rivers and streams forming the strategic links and to integrate the objectives of the Green Infrastructure Strategy throughout all relevant Council plans, such as Local Area Plans and other approved plans
Green infrastructure (G) policy 2 green	It is the policy of the Council to promote and develop a coherent, integrated and evolving Green Infrastructure network in South Dublin County that can connect to the regional network, secure and enhance biodiversity, provide readily accessible parks, open spaces and recreational facilities

CDP Policy/Objective	Text
infrastructure network	
G2 objective 1	To reduce fragmentation of the Green Infrastructure network and strengthen ecological links between urban areas, Natura 2000 sites, proposed Natural Heritage Areas, parks and open spaces and the wider regional Green Infrastructure network
G2 objective 2	To protect and enhance the biodiversity value and ecological function of the Green Infrastructure network.
G2 objective 3	To restrict development that would fragment or prejudice the Green Infrastructure network.
G2 objective 4	To repair habitat fragmentation and provide for regeneration of flora and fauna where weaknesses are identified in the network
G2 objective 5:	To integrate Green Infrastructure as an essential component of all new developments
G2 objective 8	To provide for the incorporation of Eco-ducts and/or Green Bridges at ecologically sensitive locations on the County's road and rail corridors that will facilitate the free movement of people and species through the urban and rural environment.
G2 objective 9	To preserve, protect and augment trees, groups of trees, woodlands and hedgerows within the County by increasing tree canopy coverage using locally native species and by incorporating them within design proposals and supporting their integration into the Green Infrastructure network.
G2 objective 10	To promote a network of paths and cycle tracks to enhance accessibility to the Green Infrastructure network, while ensuring that the design and operation of the routes responds to the ecological needs of each site.

CDP Policy/Objective	Text
G2 objective 11	To incorporate appropriate elements of Green Infrastructure e.g. new tree planting, grass verges, planters etc. into existing areas of hard infrastructure wherever possible, thereby integrating these areas of existing urban environment into the overall Green Infrastructure network
Green infrastructure (g) policy 3	Watercourses Network It is the policy of the Council to promote the natural, historical and amenity value of the County's watercourses; to address the long term management and protection of these corridors and to strengthen links at a regional level
G3 objective 1	To promote the natural, historical and amenity value of the County's watercourses and address the long term management and protection of these corridors in the South Dublin Green Infrastructure Strategy.
G3 objective 3	To ensure the protection, improvement or restoration of riverine floodplains and to promote strategic measures to accommodate flooding at appropriate locations, to protect ground and surface water quality and build resilience to climate change.
G3 objective 4	To uncover existing culverts and restore the watercourse to acceptable ecological standards and for the passage of fish, where possible.
G3 objective 5	To restrict the encroachment of development on watercourses, and provide for protection measures to watercourses and their banks, including but not limited to: the prevention of pollution of the watercourse, the protection of the river bank from erosion, the retention and/or provision of wildlife corridors and the protection from light spill in sensitive locations, including during construction of permitted development.

CDP Policy/Objective	Text
G4 objective 1	To support and facilitate the provision of a network of high quality, well located and multifunctional public parks and open spaces throughout the County and to protect and enhance the environmental capacity and ecological function of these spaces
G4 objective 2	To connect parks and areas of open space with ecological and recreational corridors to aid the movement of biodiversity and people and to strengthen the overall Green Infrastructure network
G4 objective 3	To enhance and diversify the outdoor recreational potential of public open spaces and parks, subject to the protection of the natural environment
G4 objective 4	To minimise the environmental impact of external lighting at sensitive locations within the Green Infrastructure network to achieve a sustainable balance between the recreational needs of an area, the safety of walking and cycling routes and the protection of light sensitive species such as bats.
G4 objective 5	To promote the planting of woodlands, forestry, community gardens, allotments and parkland meadows within the County's open spaces and parks
G4 objective 6	To take steps, in conjunction with communities and businesses, to plant existing areas of grassed open space to promote the development of multifunctional amenity areas with enhanced biodiversity value
G4 objective	To avoid the cumulative fragmentation and loss of ecologically sensitive areas of the Green Infrastructure network to artificial surfaces and to position recreational facilities that incorporate artificial surfaces at appropriate community-based locations

CDP Policy/Objective	Text
Green infrastructure (G) policy 5	Sustainable Urban Drainage Systems It is the policy of the Council to promote and support the development of Sustainable Urban Drainage Systems (SUDS) in the County and to maximise the amenity and biodiversity value of these systems.
Green infrastructure (G) policy 6	New Development in Urban Areas It is the policy of the Council to support the protection and enhancement of Green Infrastructure in all new development in urban areas, to strengthen Green Infrastructure linkage across the wider urban network and to achieve the highest standards of living and working environments
G6 objective 1	To protect and enhance existing ecological features including tree stands, woodlands, hedgerows and watercourses in all new developments as an essential part of the design process
G6 objective 2	To require new development to provide links into the wider Green Infrastructure network, in particular where similar features exist on adjoining sites
G6 objective 3	To require multifunctional open space provision within all new developments that includes provision for ecology and sustainable water management
Biodiversity and Cultural Assets	
Heritage, conservation and landscapes (HCL) policy 1	Overarching It is the policy of the Council to protect, conserve and enhance natural, built and cultural heritage features, and to support the objectives and actions of the County Heritage Plan

CDP Policy/Objective	Text
HCL1 objective 1	To protect, conserve and enhance natural, built and cultural heritage features and restrict development that would have a significant negative impact on these assets
HCL1 objective 2	To support the objectives and actions of the County Heritage Plan, including the preparation of a County Biodiversity Plan
Cultural Assets	
Heritage, conservation and landscapes (HCL) policy 2	Archaeological Heritage It is the policy of the Council to manage development in a manner that protects and conserves the Archaeological Heritage of the County and avoids adverse impacts on sites, monuments, features or objects of significant historical or archaeological interest.
Heritage, conservation and landscapes (HCL) policy 3	Protected Structures It is the policy of the Council to conserve and protect buildings, structures and sites contained in the Record of Protected Structures and to carefully consider any proposals for development that would affect the special character or appearance of a Protected Structure including its historic curtilage, both directly and indirectly.
HCL2 Objective 2	: To ensure that development is designed to avoid impacting on archaeological heritage that is of significant interest including previously unknown sites, features and objects.
HCL3 objective 3	To address dereliction and encourage the rehabilitation, renovation, appropriate use and re-use of Protected Structures.

CDP Policy/Objective	Text
Heritage, conservation and landscapes (HCL) policy 5	Older Buildings, Estates and Streetscapes It is the policy of the Council to encourage the preservation of older features, buildings, and groups of structures that are of historic character including 19th Century and early to mid 20th Century houses, housing estates and streetscapes.
Heritage, conservation and landscapes (HCL) policy 6	Features of Interest It is the policy of the Council to secure the identification, protection and conservation of historic items and features of interest throughout the County including street furniture, surface finishes, roadside installations, items of industrial heritage and other stand alone features of interest.
Landscapes	
Heritage, conservation and landscapes (HCL) policy 7	Landscapes It is the policy of the Council to preserve and enhance the character of the County's landscapes particularly areas that have been deemed to have a medium to high Landscape Value or medium to high Landscape Sensitivity and to ensure that landscape considerations are an important factor in the management of development
HCL7 objective 1	To protect and enhance the landscape character of the County by ensuring that development retains, protects and, where necessary, enhances the appearance and character of the landscape, taking full cognisance of the Landscape Character Assessment of South Dublin County (2015).
Grand Canal: Biodiversity, Flora and Fauna, Landscape, Population and Human Health and Cultural Assets	

CDP Policy/Objective	Text
Heritage, conservation and landscapes (HCL) policy 11	Grand Canal It is the policy of the Council to promote the Grand Canal as a key component of the County's Green Infrastructure network and to protect and enhance the visual, recreational, environmental, ecological, industrial heritage and amenity value of the Grand Canal (pNHA) and its towpaths, adjacent wetlands and associated habitats
HCL11 objective 1	To protect and enhance the important biodiversity resource offered by the Grand Canal.
HCL11 objective 2	To facilitate the development of the Grand Canal as a recreational route for walking, cycling, nature study and water based activities including fishing, canal boating, rowing and canoeing/kayaking, subject to appropriate environmental safeguards and assessments
HCL11 objective 3	To ensure that development along or adjacent to the Grand Canal contributes to the creation of an open and integrated network of walking and cycling routes that integrate with the Grand Canal Way Green Route.
HCL11 objective 4	To ensure that development along or adjacent to the Grand Canal protects, incorporates and enhances built and industrial heritage features, particularly historic canal and mill buildings, and also sets out to protect the setting of such built heritage features.
HCL11 objective 5	To ensure that development along and adjacent to the Grand Canal protects and incorporates high value natural heritage features including watercourses, wetlands, grasslands, woodlands, mature trees, hedgerows and ditches and includes for an appropriate set-back distance or buffer area from the pNHA boundary to facilitate protected species, biodiversity, and a fully functioning Green Infrastructure network.

CDP Policy/Objective	Text
HCL11 objective 6:	enhance the industrial heritage and the recreational and amenity potential of the 12th Lock and pursue the protection and conservation of the rich natural, built and cultural heritage of the area including natural habitats and ecological resources along the Grand Canal and Griffeen River
Cultural Assets	
Heritage, conservation and landscapes (HCL) policy 18	Cultural Heritage It is the policy of the Council to promote the County's cultural heritage.
HCL18 objective 1	To work towards establishing an environment for promoting cross cultural understanding, racial harmony, mutual understanding and appreciation of all religious and ethnic traditions through the County.
HCL18 objective 2	To promote the Irish Language and favour its use in the promotion of the Villages Initiative
HCL18 objective 3	To promote local heritage, the naming of any new residential development will reflect the local and historical context of its siting, and should include the use of the Irish language
Climate Change and energy	
Energy (E) policy 1	Responding to European and National Energy Policy & Legislation It is the policy of the Council to respond to the European and National Energy Programme through the County Development Plan – with policies and objectives that promote energy

CDP Policy/Objective		Text
		conservation, increased efficiency and the growth of locally based renewable energy alternatives, in an environmentally acceptable and sustainable manner.
Energy policy 2	**(E)**	South Dublin Spatial Energy Demand Analysis It is the policy of the Council to implement the recommendations of the South Dublin Spatial Energy Demand Analysis (SEDA) in conjunction with all relevant stakeholders, promoting energy efficiency and renewable energy measures across the County
Energy policy 3	**(E)**	Energy Performance in Existing Buildings It is the policy of the Council to promote high levels of energy conservation, energy efficiency and the use of renewable energy sources in existing buildings
E3 objective 1		To ensure that medium to large scale residential and commercial developments are designed to take account of the impacts of climate change, including the installation of rainwater harvesting systems and that energy efficiency and renewable energy measures are incorporated in accordance with national building regulations, policy and guidelines.
Energy policy 4	**(E)**	Energy Performance in New Buildings It is the policy of the Council to ensure that new development is designed to take account of the impacts of climate change, and that energy efficiency and renewable energy measures are considered in accordance with national building regulations, policy and guidelines.
Energy policy 6	**(E)**	Low Carbon District Heating Networks (a) It is the policy of the Council to support the development of low carbon district heating networks across the County based on technologies such as combined heat and power (CHP), large scale heat pumps, and renewable energy opportunities including geothermal energy, energy from waste, biomass and bio-gas. (b) It is the policy of the Council to support the development of both deep and shallow geothermal energy sources throughout the County. Deep geothermal projects are particularly suited to areas demonstrating high heat densities

CDP Policy/Objective	Text
Energy policy 7 (E)	Solar It is the policy of the Council to promote the development of solar energy infrastructure in the County, in particular for on-site energy use, including solar PV, solar thermal and seasonal storage technologies. Such projects will be considered subject to environmental safeguards and the protection of natural or built heritage features, biodiversity and views and prospects.
Energy policy 10 (E)	Small to Medium Scale Wind Energy Schemes It is the policy of the Council to encourage small to medium scale wind energy developments within industrial or business parks, and support small community-based proposals in urban areas provided they do not negatively impact upon the environmental quality, and visual or residential amenities of the area
11.8.1 Environmental Impact Assessment	The Planning and Development Regulations 2001 specify mandatory thresholds above which Environmental Impact Statements (EIS) are required, setting out the types and scale of development proposals that require EIS. Where it appears to the Planning Authority that a development proposal that falls below the thresholds set out in the Planning and Development Regulations would be likely to have a significant environmental effect, a subthreshold/discretionary EIS can be requested by the Planning Authority.
11.8.2 Appropriate Assessment	Under Article 6 of the Habitats Directive there is a requirement to establish whether, in relation to plans and projects, Appropriate Assessment (AA) is required. If, following screening, it is considered that AA is required then the proponent of the plan or project must prepare a Natura Impact Statement. A plan or project will only be authorised after the competent authority has ascertained, based on scientific evidence, Screening for Appropriate Assessment, and a Stage 2 Appropriate Assessment where necessary, that: The plan or project will not give rise to significant adverse direct, indirect or secondary effects on the integrity of any Natura 2000 site (either individually or in combination with other plans or projects), or The plan or project will have significant adverse effects on the integrity of any Natura 2000 (that does not host a priority natural habitat type and/or a priority species) but there are no alternative solutions and the plan or project must nevertheless be carried out for imperative reasons of overriding public interest – including those of a social or economic nature. In this case, it will be a requirement to follow

CDP Policy/Objective	Text
	procedures set out in legislation and agree and undertake all compensatory measures necessary to ensure the protection of the overall coherence of a Natura 2000 site/network, or The plan or project will have a significant adverse effect on the integrity of any Natura 2000 site (that hosts a natural habitat type and/or a priority species) but there are no alternative solutions and the plan or project must nevertheless be carried out for imperative reasons for overriding public interest - restricted to reasons of human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest. In this case, it will be a requirement to follow procedures set out in legislation and agree and undertake all compensatory measures necessary to ensure the protection of the overall coherence of a Natura 2000 site/network

8.3 Specific Mitigation Measures

Table 8.1 Specific Mitigation Measures

SEA Parameter		Relevant SEO
Biodiversity, Flora and Fauna -		
MM1	Development proposals on the Variation lands close to the Grand Canal shall protect and incorporate high value natural heritage features including watercourses, wetlands, grasslands, woodlands, mature trees, hedgerows and ditches and include for a 50m setback for all buildings and a 30m set-back distance for development (with the exception of bridges and footpaths) from the pNHA boundary to facilitate the continuity of the Grand Canal as a corridor for protected species, biodiversity, and a fully functioning Green Infrastructure network. Figure8.1 shows these set back distances from the northern boundary.	BFF1 BFF2 BFF3 W1
MM2	A Biodiversity Management Plan will be prepared by a qualified ecologist and be guided by relevant best practice guidelines and established techniques for habitats present on lands. The Biodiversity Management Plan shall incorporate the following measures • The preservation of existing hedgerows, treelines, woodland, scrub and other semi-natural habitats where possible • High value historical hedgerows shall be retained and management details included; • Where hedgerows, treelines woodland and other semi-natural habitats are to be retained within the Variation lands, details of their management and protection should be provided in a Habitat Management Plan. • Opportunities to enhance the biodiversity value of SUDs measures where relevant should be included in habitat management plans.	BFF1 BFF2 BFF3 W1 L1 CH1 CC1

MM3	Invasive Species Three invasive species have been recorded in the area surrounding the Variation lands; Canadian Waterweed (*Elodea canadensis*), Nuttall's Waterweed (*Elodea nutallii*) and Snowberry (*Symphoricarpos albus*). No development shall take place on the lands until an Invasive Species Management and Control Plan has been prepared and implemented to prevent the introduction of any new species, prevent the movement and spread of any existing species and eradicate any existing invasive species from the lands. The intent of an Invasive Species Management and Control Plan is that all equipment and material must arrive at the site free of any invasive plant species propagules and that all equipment and material leaving the site must be free of any invasive plant species propagules. The Invasive Species Management and Control Plan shall be prepared by a suitably qualified person and shall include the following objectives: • To prevent the introduction of any new species of alien invasive plant to the site; • To prevent the movement and spread of any existing alien invasive plant species on site; • To eradicate any populations of invasive alien plan species on site; 1. The Invasive Species Management and Control Plan shall Identify and map existing alien invasive plant species present within the Variation lands and immediate area 2. Eradicate any populations of invasive species in accordance with best practice principles and guidelines issued by Invasive Species Ireland and National Parks and Wildlife Service. 3. Annual monitoring of the site for 5 years post eradication to ensure that any populations of alien invasive plant species have been eradicated; and 4. Traceability of all imported material and the imposition of requirement for certification of all imported material as being	SG1 BFF1, 2 and 3 W1 L1

	free of propagules of any Third Schedule-listed alien invasive plant species.	
MM4	All future developments shall outline measures that aim to minimise light spill along the northern boundary of the Variation Lands, adjacent to the Grand Canal pNHA and ecological sensitive area.	BFF1, 2 and 3
MM5	During the planning phase for all lower tier plans and projects for the Variation Lands detailed surveys for fauna and flora will be required to inform an assessment of the proposal's potential to result in significant disturbance to ecological receptors.	BFF1, 2 and 3
	Population and Human Health	
MM6	Landscaping and retention of treelines and hedgerows where possible offer a multifunctional ecosystem service that can assist in mitigating effects associated with industrial activities, particularly around noise and air quality.	PH1 BFF1 L1 AQ1
Water Resources including Flooding		
MM7	To protect water quality: - new developments will be required to incorporate containment measures and managing accidental release to protect against discharges of hazardous substances to ground.	W1 W2 BFF1 PH1
MM8	Identification of any contaminated land will require demonstration of suitable remediation /licensed disposal.	W1 W2 BFF1 PH1
MM9	• To maintain the natural groundwater and surface water regime, new developments will incorporate SuDs measures, ensuring clean stormwater is discharged to ground from hardstand areas where feasible. SUDs measures should	W1 W2 W3 BFF1

	also incorporate biodiversity enhancement where possible.	PH1
MM10	• To minimise any increased risk of flooding, new developments will have to show that the site is suitable for development and will not increase the risk of flooding elsewhere. They will have to comply with guidelines produced by the Department of the Environment, Heritage and Local Government (DoEHLG) - The Planning System and Flood Risk Management Guidelines for Planning Authorities, November 2009	W3 PH1
Climate Change, Air Quality and Noise		
MM11	Operational Air Emissions • Any significant air emissions within the proposed rezoned lands will be regulated by the EPA in the form of an Industrial Pollution Control (IPC) or Industrial Emissions (IE) Licence. The facility will have strict air emissions limits outlined in the relevant licence which will be set to ensure compliance with ambient air quality standards. Prior to operation the facility will be required to undertake a stack height determination of all main emission points to ensure that all air emissions from the facility will be in compliance with the ambient air quality standards at all times. Secondly, all significant emission points regulated by the EPA will, in accordance with Council Directive 2010/50/EC (Industrial Emissions Directive) be required to ensure that they are adhering to the principles of BAT. The purpose of the Directive is to "ensure a high level of protection of the environment taken as a whole". The Directive has stated that the permit conditions including air emission limit values (ELVs) must be based on Best Available Techniques (BAT) with BAT conclusions the reference for setting permit conditions.	PH1 BF1 MA1 CC
MM12	A landscape management framework will be prepared that will address the following: Soil sealing	BFF1 BFF2 L1

	Incorporation of SUDs into overall design that offers biodiversity enhancement where possible Boundary treatments and retention of hedgerows where possible Management regime for retained hedgerows and treelines Buffer area between lands and the Grand Canal. Open space Lighting proposals particularly in areas close the Grand Canal.	PH1
	Cultural Heritage	
MM13	It should be noted that preservation in situ is the preferred policy of the National Monuments Service (Department of Culture, Heritage and the Gaeltacht). Archaeological sites should be avoided, unless it can be demonstrated that this is not possible, in which case preservation by record (excavation) may be considered by the National Monuments Service.	CH1 L1 PH1
MM14	• Architectural Heritage Regard should be had in any future development for the Grand Canal and its associated structures and to the complex at Peamount Hospital, which are located on the periphery of the lands. An architectural record should be made of any structure or feature of built heritage interest that would be subject to a direct impact as a result of development within the Grange Castle Western Lands.	CH1 L1 PH1
Landscape		
MM15	All development proposals along the Grand Canal shall be accompanied by a detailed landscaping plan, prepared by a suitably qualified landscape architect. The landscape plan shall address the varying topography of the site and shall have regard to the proposed Natural Heritage Area and the Protected Species using this corridor.	

	The plan shall also include details of hard and soft landscaping, proposed species and sensitive lighting. Where new canal crossings (i.e footbridges/cycle bridges) are proposed, they shall be designed so as to avoid fragmentation of linear habitats associated with the Grand Canal Corridor	

8.4 Environmental Construction and Management Plan (CEMP)

Construction Environmental Management Plans (CEMPs)

A CEMPS shall be prepared in advance of the physical elements associated with the Variation and will be implemented throughout. Such plans shall incorporate relevant mitigation measures indicated below.

- South Dublin County Council will be informed in advance of construction activities in sensitive environmental areas.
- SDCC will be informed of all construction or maintenance works located within the vicinity of pNHAs (Grand Canal) or in the vicinity of watercourses linked to these designated conservation areas. Monitoring of works in these locations will be undertaken and the results of monitoring will be provided to SDCC.
- Ensure non-native, invasive species do not occur at construction/maintenance areas, or if occurring, are not spread as a results of works. The NRA Guidance on invasive species, outlined above will be adhered to as well as the Invasive Species Management and Control Plan.
- Disseminate information on sensitive ecological receptors, such as sensitive habitats, breeding birds etc. occurring adjacent to or in the wider area. This information will aim to educate recreational users on the conservation status and sensitivities of such receptors to encourage responsible usage of routes.
-
- Where works are undertaken in/adjacent to sensitive environmental receptors all construction/maintenance staff will be inducted by means of a “Tool-box Talk” which will inform them of environmental sensitivities and the best practice to be implemented to avoid disturbance to these receptors

All construction and maintenance works will be undertaken in accordance with the following guidance documents:

- Inland Fisheries Ireland's Requirements for the Protection of Fisheries Habitat during Construction and Development Works.
- CIRIA (Construction Industry Research and Information Association) Guidance Documents
- Control of water pollution from construction sites (C532)
- Control of water pollution from linear construction projects: Technical Guidance (C648)
- Control of water pollution from linear construction projects: Site Guide (C649)
- Environmental Good Practice on Site (C692)
- NRA Guidance Documents
- Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes
- Guidelines for the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads
- Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, during and Post Construction of National Road Schemes.

- Any excavations and/or vegetation removal will minimised during construction and/or maintenance works.
- Excavated material will not be stored immediately adjacent to watercourses.
- Disturbance to natural drainage features should be avoided during the construction and/or maintenance of routes.
- Construction machinery should be restricted to public and or site roads. As a general rule machinery should not be allowed to access, park or travel over areas outside the footprint of proposed walking/cycling routes.
- During route maintenance no construction activities should be undertaken at watercourse crossing in wet weather conditions.
- Suitable prevention measures should be put in place at all times to prevent the release of sediment to drainage waters associated with construction areas and migration to adjacent watercourses To reduce erosion and silt-laden runoff, create, where possible, natural vegetation buffers and divert runoff from exposed areas, control the volume and velocity of runoff, and convey that runoff away from.
- Where necessary drainage waters from construction areas should be managed through a series of treatment stages that may include swales, check dams and detention ponds along with other pollution control measures such as silt fences and silt mats

- Where vegetation removal associated with treelines, hedgerows, individual mature trees, scrub or woodland is required, this shall only be undertaken outside the breeding bird season, between March and August inclusive.

8.4.1 Climate

Specific construction management plans will be formulated for the construction phase of any specific project within the proposed rezoned lands, as construction activities are likely to generate some greenhouse gas emissions.

Any significant greenhouse emissions within the proposed rezoned lands will be regulated by the EPA in the form of a Greenhouse Gas Emissions Permit as per Council Directive 2009/29/EC "the (revised) EU Emission Trading Scheme (EU ETS)") prior to operation. The ETS Phase III scheme (2013-2020) has an EU-wide cap on GHG emissions for relevant industrial installations with a target of a 20% emissions reduction compared to 1990 levels. The cap is lowered each year by 1.74% over the period 2013-2020 in order to achieve this target.

8.4.2 Air Quality

Specific dust minimisation plans will be formulated for the construction phase of any specific project within the proposed rezoned lands, as construction activities are likely to generate some dust emissions. The potential for dust to be emitted depends on the type of construction activity being carried out in conjunction with environmental factors including levels of rainfall, wind speeds and wind direction. The potential for impact from dust depends on the distance to potentially sensitive locations and whether the wind can carry the dust to these locations. The majority of any dust produced will be deposited close to the potential source and any impacts from dust deposition will typically be within several hundred metres of the construction area (UK ODPM, 2000).

In order to ensure that no dust nuisance occurs, a series of measures will be implemented. Measures that will typically be implemented are outlined below:

- Site roads shall be regularly cleaned and maintained as appropriate. Hard surface roads shall be swept to remove mud and aggregate materials from their surface. Furthermore, any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions.

- Speeds shall be restricted on hard surfaced roads as site management dictates. Vehicles delivering material with dust potential shall be enclosed or covered with tarpaulin at all times to restrict the escape of dust.

- Public roads in the vicinity of the site shall be regularly inspected for cleanliness, and cleaned as necessary.

- The dust minimisation plan shall be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures.

- Where extensive areas of ground are to be exposed during route construction or maintenance dust suppression should be undertaken during periods of dry weather.

8.4.3 Pollution Prevention and Controls

- All chemical substances required during construction and/or maintenance works will be stored in sealed containers.
- Any refuelling or lubrication of machinery will not be undertaken within 50m of a watercourse
- Spill kits will be required on site during construction and/or maintenance works.

8.4.4 Construction Practice

CEMPs typically provide details of intended construction practice for the proposed development, including:

a) location of the sites and materials compound(s) including area(s) identified for the storage of construction refuse

b) location of areas for construction site offices and staff facilities

c) details of site security fencing and hoardings

d) details of on-site car parking facilities for site workers during the course of construction

e) details of the timing and routing of construction traffic to and from the construction site and associated directional signage

f) measures to obviate queuing of construction traffic on the adjoining road network

g) measures to prevent the spillage or deposit of clay, rubble or other debris

h) alternative arrangements to be put in place for pedestrians and vehicles in the case of the closure of any public right of way during the course of site development works

i) details of appropriate mitigation measures for noise, dust and vibration, and monitoring of such levels

j) containment of all construction-related fuel and oil within specially constructed bunds to ensure that fuel spillages are fully contained; such bunds shall be roofed to exclude rainwater

k) disposal of construction/demolition waste and details of how it is proposed to manage excavated soil

l) a water and sediment management plan, providing for means to ensure that surface water runoff is controlled such that no silt or other pollutants enter local water courses or drains

m) details of a water quality monitoring and sampling plan

n) if peat is encountered - a peat storage, handling and reinstatement management plan

o) measures adopted during construction to prevent the spread of invasive species (such as Japanese Knotweed)

p) Appointment of an ecological clerk of works at site investigation, preparation and construction phases

9.0 MONITORING

9.1 Introduction

It is proposed, in accordance with the SEA Directive, to base monitoring on a series of indicators which measure changes in the environment, especially changes which are critical in terms of environmental quality, for example water or air pollution levels. Monitoring will focus on the aspects of the environment that are likely to be significantly impacted upon by the implementation of the variation. The targets and indicators are derived from the Strategic Environmental Objectives (SEOs) discussed in Chapter Five. The target underpins the objective whilst the indictors are used to track the progress of the objective and targets in terms of monitoring of impacts.

The monitoring programme will consist of an assessment of the relevant indicators and targets against the data relating to each environmental component. Similarly, monitoring will be carried out frequently to ensure that any changes to the environment can be identified.

9.2 Frequency of Monitoring and Reporting

SEA monitoring reporting should go parallel with any review of the development plan. In that regard, the impact of the proposed variation will be monitored within the constraints of the existing monitoring system for the Development Plan.

However, in some cases as data becomes available, the Planning Authority may prepare an additional SEA Monitoring Report. In particular, should new data or the following occur, additional monitoring will be required:

- Significant unauthorised development (either large scale or cumulative small scale)
- Illegal waste activity
- Water pollution incidents (not resulting from oil spills).

In turn the list below is subject to review at each reporting stage to reflect new data. Should the monitoring regime identify significant impacts (such as impacts on designated sites) early on in the plan implementation, this should trigger a review of the plan and monitoring regime. In addition, the identification of positive impacts from monitoring should also be reported as this will assist in determining successful environmental policies.

It is recommended that data arising from planning applications, particularly in terms of environmental constraints mapping and Environmental Impact Statements be integrated into the GIS and monitoring system. This will assist in assessing cumulative impacts also, in particular ecology and water quality.

Finally, it is recommended that the monitoring report be made available to the public upon its completion. It is recommended that this data be shared with neighbouring local authorities to assist in monitoring cross county effects and ensure consistency of monitoring.

9.3 Environmental Objectives

SEA Topic	Strategic Environmental Objectives	Indicator	Target	Data Source
Biodiversity **Flora and Fauna**	BFF1:To avoid loss of habitats, geological features, species or their sustaining resources in ***and outside of*** [7]designated and ecological sites	B1: Percentage of relevant habitats, features and species lost as a result of implementation of the Variation	B1: No losses of relevant habitats, species or their sustaining resources in designated ecological sites as a result of implementation of the Variation	Designated ecological sites mapping, CORINE Mapping, National Parks and Wildlife Service Records & Development Management Process in SDCC.
	BFF2:To avoid significant adverse impacts, including direct, cumulative and indirect impacts, to habitats, geological features,	B2: Number of significant adverse impacts, including direct, cumulative and indirect impacts, to relevant habitats, geological features, species or their sustaining resources in designated ecological sites by development within or adjacent to these sites as a result	B2: No significant adverse impacts, including direct, cumulative and indirect impacts, to relevant habitats, geological features,	Designated ecological sites mapping, Development Management Process in SDCC Council &

SEA Topic	Strategic Environmental Objectives	Indicator	Target	Data Source
	species or their sustaining resources in designated ecological sites by development within or adjacent to these sites.	of implementation of the Variation.	species or their sustaining resources in designated ecological sites by development within or adjacent to these sites as a result of implementation of the Variation	Consultation with the National Parks and Wildlife Service Primary ecological corridors mapping, CORINE mapping and Development Management Process in SDCC.
	BFF3: To sustain, enhance or - where relevant - prevent the loss of ecological networks or parts thereof which provide significant connectivity between areas of local biodiversity.	Area of Biodiversity Network (County's primary ecological corridors which has been lost without mitigation. Percentage loss of functional connectivity without remediation resulting from development provided for.	No ecological connectivity provided by the County's primary ecological corridors to be lost without mitigation as a result of implementation of the CDP No significant ecological networks or parts thereof which provide functional connectivity to be lost without remediation resulting from development permitted under Proposed Variation No.1	
Population and human health	PH1: To protect human health from hazards or	Number of occasions that PM10 limits have been exceeded in at Air	Reduce number of people exposed to	South Dublin County Council, EPA

SEA Topic	Strategic Environmental Objectives	Indicator	Target	Data Source
	nuisances arising from traffic and incompatible land uses specifically noise, air pollution and water pollution***.***	Monitoring stations closest to Variation[8]. Number of IPPC licensed activities permitted under the Variation. Record of any exceedances under IPPC licenses ***Number of complaints regarding noise, light and air quality for lands developed through the Variation.***	traffic noise and air quality levels which endanger health and quality of life.	
Climate Change, Air Quality and Noise **-air quality and noise are included in Population and Human Health SEOs**	CC1 To minimise increases in travel related Greenhouse Gas emissions to air.	Extent of developments built within Variation lands with access to of high quality public transport accessibility. Number of IPPC licenses activities granted under Variation No.1	An increase in the percentage of the population within the County travelling to work by public transport or non-mechanical means.	
Water	W1:To maintain and improve, where possible, the quality of rivers, lakes and surface water including ***Grand Canal***	Biotic Quality Rating (Q Value) and risk assessment.	To maintain a biotic quality rating of Q4, in line with the requirement to achieve good water status under the Water Framework Directive, **by 2027.**	Environmental Protection Agency.

[8] Currently air quality monitoring closest station is at Tallaght.

SEA Topic	Strategic Environmental Objectives	Indicator	Target	Data Source
			To improve biotic quality ratings, where possible, to Q5.	Environmental Protection Agency As noted under Section 2.3.1, data may not be available for this indicator when the monitoring evaluation is being prepared.
	W2: To prevent pollution and contamination of ground water.	Groundwater Quality Standards and Threshold Values under Directive 2006/118/EC.	Compliance with Groundwater Quality Standards and Threshold Values under Directive 2006/118/EC.	SDCC Irish Water EPA
	W3:To prevent development on lands which pose - or are likely to pose in the future – a significant flood risk	Percentage of area granted planning permission on lands prone to flooding as identified by PFRA or CFRAM mapping.	No significant flood events associated with development activities related to Variation lands	Development Management Process in South Dublin County Council
Soil and Geology	SG1: To conserve soil resources	• To minimise the loss of greenfield development and maximise linkage and use of greenspace for	S1ii: To reduce the amount of Greenfield lands	Development Management Process in SDCC

SEA Topic	Strategic Environmental Objectives	Indicator	Target	Data Source
	where possible.	biodiversity enhancement, • To fully utilise any brownfield sites identified and remediate any contaminated land encountered during redevelopment, • To minimise the volume of waste (including soil) leaving the site for landfill and meet national waste reduction targets. Number of contaminated sites identified and remediated. • There are no legislative thresholds for soil quality in Ireland. As such monitoring of receiving water quality as part of the EPA programme for water body status is the most relevant measure of soil quality. • Monitoring of tonnage of soil exported from the site and tonnage of contaminated soil disposed to licensed facilities will provide information on the soil loss and remediation of brownfield/contaminated sites. Volume of waste recycled and volume of waste sent to landfill.	developed ***subject to Variation Objectives*** To meet national and EU targets on the recycling of municipal waste and its diversion from landfill	As above Environmental Services Dept. SDCC Annual Waste Arisings Report from Environmental Services Dept. SDCC

SEA Topic	Strategic Environmental Objectives	Indicator	Target	Data Source
Material Assets	MA1: To maintain and improve the quality of drinking water supplies.	Drinking water quality standards, (Microbiological, Chemical and Indicator parameters)	To maintain and improve drinking water quality in South Dublin County to comply with requirements of the European Communities (Drinking Water) Regulations 2000	SDCC Irish Water EPA
	MA2:To serve new development under with appropriate waste water treatment		All new developments to require appropriate waste water systems.	SDCC Irish Water EPA
	MA3: To reduce car dependency within the proposed lands by way of, inter alia, encouraging modal change from car to more sustainable forms of public transport and encouraging development which will not be dependent on private transport.	Extent of developments built within proposed lands with access to of high quality public transport accessibility.	An increase in the percentage of the population within the County travelling to work or school by public transport or non-mechanical means. A decrease in the average distance travelled to work or school by the population of the County.	SDCC CSO Census

SEA Topic	Strategic Environmental Objectives	Indicator	Target	Data Source
	MA4:To minimise waste production and reduce the volume of waste to landfill and to operate sustainable waste management practices including promotion of circular economy	Volume of waste recycled and volume of waste sent to landfill Recycling facilities provided.	To meet national and EU targets on the recycling of municipal waste and its diversion from landfill	Development Management Process in SDCC As above Environmental Services Dept. SDCC Annual Waste Arisings Report from Environmental Services Dept. SDCC
Cultural Heritage	CH1: To protect the archaeological heritage of the proposed variation lands with regard to entries to the Record of Monuments and Places - including Zones of Archaeological Potential - and the context of the above within the surrounding landscape where relevant.	Percentage of entries to the Record of Monuments and Places - including Zones of Archaeological Potential (and the context of the above within the surrounding landscape where relevant) - protected ***Number of archaeological surveys required as part of planning applications*** ***Conditions attached to permissions on archaeological monitoring during excavations.***	Protect entries to the Record of Monuments and Places - including Zones of Archaeological Potential (and their context of the above within the surrounding landscape where relevant) ***Protect unknown archaeological resources on Variation Lands.***	SDCC Development Control
	CH2:To preserve and	Percentage of entries to the Record of	Protect entries to the Record	SDCC

SEA Topic	Strategic Environmental Objectives	Indicator	Target	Data Source
	protect the special interest and character of architectural heritage with regard to entries to the Record of Protected Structures, and their context within the surrounding landscape where relevant.	Protected Structures (and/or their context within the surrounding landscape where relevant) protected. Number of architectural condition surveys attached to planning applications.	of Protected Structures (and/or their context within the surrounding landscape where relevant) ***Renovate and reuse architectural heritage structures and features***	
Landscape	L1:To protect and avoid significant adverse impacts on the landscape, landscape features and designated scenic routes; especially with regard to areas of high amenity ***and the Grand Canal***	The creation of a sense of place and coherence/ appreciation for the overall setting and context of Variation Number of development applications with landscape and habitat plans and Design Statements. Amount of land allocated to temporary greening measures.	Creation of sense of place with all phases of development associated with the Variation.	SDCC
Climate Change	***CC1:To integrate climate change adaptation to the Variation***	***Number of SUDs measures included and developed as part of development proposals***	***Integrated blue and green infrastructure through the Variation lands.***	***SDCC***

SEA Topic	Strategic Environmental Objectives	Indicator	Target	Data Source
		Number/extent of additional tree planting as part of applications.		

9.4 Conclusion

This SEA Environmental Report demonstrates how environmental parameters have been addressed in the plan preparation process. Consultation has been undertaken for the Scoping of this Environmental Report and further opportunity to comment on the proposed variation will be possible over the forthcoming weeks.

The preparation of a specific Environmental Management Plan to accompany the proposed variation is the key output of the SEA process and has been developed and refined through the SEA and associated environmental assessment processes to date.

The SEA and Screening for Appropriate Assessment has been undertaken in line with the Planning and Development (Strategic Environmental Assessment) Regulations 2004 to 2011 (as amended). Subject to the full and proper implementation of the mitigation measures outlined in this SEA Environmental Report and the proposed variation including detailed design at planning application stage, it is considered that significant adverse impacts on the environment will be avoided.