

Kildare County Council

**Variation to the Kildare County
Development Plan 2017-2023**

SEA Environmental Report

Issue | 6 July 2020

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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1 Non-Technical Summary

NTS1: Introduction

This is a non-technical summary of the Environmental Report that has been prepared as part of the Strategic Environmental Assessment (SEA) of the Variation to the Kildare County Development Plan (2017-2023) (hereafter referred to as ‘the Variation’). The document has been prepared in accordance with national and EU legislation. It draws attention to the most important issues and provides information on other significant topics.

Any topic which causes concern can be followed in greater detail in the main Environmental Report.

The relevant planning legislation comprises the Planning and Development Act 2000, as amended and the Planning and Development Regulations 2001, as amended. Key planning documents reviewed as part of the assessment included:

- Project Ireland 2040: National Planning Framework;
- The Regional Planning Guidelines for the Greater Dublin Area 2010-2022;
- Regional Spatial and Economic Strategy (RSES) for the Eastern and Midlands Region 2019-2031;
- Kildare County Development Plan (2017-2023).

Cognisance was also given to a wide range of legislation, plans and programmes at international, national, regional and for relevance to the Variation.

NTS2: Variation to Kildare County Development Plan 2017-2023

The Variation is required to integrate the changes in national policy and to account for revised population forecasts contained in the Project Ireland 2040; National Planning Framework (‘NPF’) into the Kildare County Development Plan 2017-2023.

The NPF was published on 16 February 2018 and sets out a course for planning and development in Ireland. The NPF was adopted on 29 May 2018 and was further supported by the publication of the Implementation Roadmap for the National Planning Framework (‘Roadmap’) which was published on 3 July 2018. This document confirmed that the NPF was adopted as a strategy to replace the National Spatial Strategy (2002-2020, NSS) and advised that the NPF is of direct relevance to the preparation of Regional Spatial and Economic Strategies and County Development Plans.

The Roadmap highlights that one of the key reasons Government has put in place the NPF is to shape and coordinate planning, economic and spatial development and infrastructure investment at national, regional and local levels, through the Regional Spatial and Economic Strategies (RSESs), prepared by the three Regional Assemblies, and City and County Development Plans and Local Area Plans.

Following the recent process regarding the adoption of the RSES for the Eastern & Midlands Region, it was considered by the Department that there was a need to put in place a mechanism to ensure:

- a) Local Authority Development Plan review processes underway within the RSES finalisation period could be paused until such time as they could benefit from the latest data and policy contexts from the RSES; and
- b) Recently adopted plans, which ordinarily last for six years, would be brought forward for review or Variation.

As the Kildare CDP review was only adopted in February 2017, a Variation of the Plan is the appropriate approach as advised.

The Variation is be a key document for setting out a vision for how Kildare should develop over the years 2020-2023 and beyond.

NTS3: SEA Methodology

The objective of the Strategic Environmental Assessment (SEA) Directive is ‘to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans ... with a view to promoting sustainable development’ (Article 1 SEA Directive). It is a systematic, on-going process for evaluating, at the earliest possible stage, the environmental quality and consequences of implementing certain plans and programmes on the environment.

The SEA methodology is based on legislative requirements and EPA guidance and will ensure compliance with the SEA Directive and associated legislation. The EPA’s SEA Pack (Version 18/04/2013) was also used as a source of information during the SEA process.

NTS4: Current State of the Environment

The assessment of the plan with respect to the current Environmental Baseline is the principal task of the SEA process. Consequently, this baseline description must be cognisant of the County level nature of the Variation and the pressures and interrelationships between environmental topics.

The environmental baseline provides an overview of the existing conditions in the County area relevant to the Variation and covers the following environmental topics:

- Biodiversity.
- Population and Human Health.
- Land and Soils.
- Water.
- Air, Noise and Climate.
- Archaeological, Architectural and Cultural Heritage.
- Landscape and Visual.

- **Material Assets.**

County Kildare is located in the Mid-East Region in Ireland. It is completely inland and bordering Dublin. The dominant environments across the County are improved grassland (for agriculture), urban, built land and forest/woodland (mixed and broad leaved) and bog and wet lands. The three prominent water bodies located in Kildare are the River Liffey, the River Barrow and the River Boyne. These rivers along with their tributaries, smaller rivers, lakes and reservoirs are an important part of Kildare's landscape and natural heritage.

Kildare has geographically varied population density. The northeast of the County has significantly higher population density with the largest towns located in this same vicinity – including Naas, Maynooth, Leixlip, Newbridge and Celbridge. Population growth is expected across the County with the percentage of the population residing in the County's towns and villages planned to increase while the proportion living in rural countryside is expected to reduce.

The close proximity and easy access to Dublin has resulted in large scale residential, commercial and industrial development in Kildare. Kildare has a widespread transport network with many of the main transportation corridors linking Dublin to the rest of the country passing through the County. Many residents of Kildare commute for employment with Dublin being the primary commuter destination. The improvement of public transport service and availability to the main centres of employment and retail is essential to improving accessibility in County Kildare.

According to the EPA's State of the Environment Report, 2016, Ireland's environment remains in a good condition, although there are a number of key challenges in the coming years. The report identified four priority challenges for the environment, which comprise; valuing and protecting our natural environment; building a resource-efficient low-carbon economy; putting the environment at the centre of our decision making and implementing environmental legislation.

In the EPA's 2020 Vision document it is noted that pressures on the Irish environment increased significantly as a result of a decade of rapid and unprecedented economic growth. Unfortunately, these pressures have accelerated at a rate that far exceeds that observed in other EU countries.

NTS5: Objectives, Targets and Indicators

The SEA is designed to assess the potential environmental impact of the Variation to the Kildare County Development Plan (2017-2023) and its associated policies and objectives against the environmental baselines established.

The Variation policies and objectives are assessed against a range of established environmental objectives and targets.

Indicators that are recommended in the SEA are utilised over the lifetime of the Variation to quantify the potential level of impact that the policies and objectives are likely to have on the environment. This enables the measurement of the success of the policies in promoting the sustainable development of the area.

NTS6: Assessment of Likely Significant Effects

The environmental impacts of the Variation policies and objectives were assessed with respect to the existing environmental baseline and environmental objectives.

As the policies included in the Variation have been designed to promote sustainability and to protect the environment, the majority of policies are expected to have positive impacts when assessed against the environmental objectives. A matrix was prepared to examine these potential impacts.

NTS7: Consideration of Alternatives

Alternative development scenarios were considered in the preparation of the Variation to the Kildare County Development Plan 2017-2023.

Three alternative plan scenarios were considered as part of the SEA process. The development of scenarios has been informed by the National Planning Framework and the requirements in regard to compact growth. The scenarios considered provide for alternative methods of meeting these requirements.

These alternative scenarios fulfil the requirements of being realistic, capable of implementation, and representing a range of different approaches within statutory and operational requirements of the Variation to the County Development Plan.

Each scenario was assessed against the environmental aspects and a preferred scenario from an environmental perspective determined.

NTS8 Mitigation Measures

Mitigation measures are measures envisaged and designed to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the Variation to the Kildare County Development Plan. All potential effects have been identified as neutral or positive, therefore, specific mitigation measures do not need to be considered.

It is envisaged that all planning applications for new developments in the County will be environmentally assessed and specific mitigation proposed where appropriate.

NTS9: SEA Monitoring

Article 10 of the SEA Directive requires that monitoring should be carried out in order to identify at an early stage any unforeseen adverse impacts associated with the implementation of the Variation.

A monitoring programme was developed based on the indicators selected to track progress towards achieving strategic environmental objectives and reaching targets, enabling positive and negative impacts on the environment to be measured. As previously described, the environmental indicators have been developed to show changes that would be attributable to implementation of the Variation.

Kildare County Council, as the planning authority, is responsible for collating existing relevant monitored data, the preparation of preliminary and final

monitoring evaluation reports, the publication of these reports and, if necessary, the carrying out of corrective action.

2 Introduction

2.1 Introduction

Kildare County Council (KCC), as the competent authority, is currently preparing a Variation to the Kildare County Development Plan (CDP) to reflect the adoption of the National Planning Framework (NPF) and the Eastern and Midlands Regional Spatial and Economic Strategy 2019-2031 (RSES) (hereafter referred to as ‘the Variation’). The Variation to the CDP will amend the Kildare CDP 2017-2023.

Arup has been appointed by KCC to prepare the Strategic Environmental Assessment (SEA) documentation of the Variation, which will set out the strategic land use and planning policy guidance for the Variation to the Kildare County Development Plan 2017-2023.

This SEA Environmental Report presents the findings of the environmental assessment of the likely significant effects on the environment as a result of the Variation. A Scoping Report was previously prepared which provided information to allow consultation with defined statutory bodies on the scope and level of detail to be considered in the environmental assessment. Any issues or concerns raised during the scoping process or during the consultation period for the Variation has been incorporated into this report. An SEA Statement accompanies this Environmental Report.

2.2 Planning Context

The Variation to the Kildare County Development 2017-2023 has been prepared under Section 13 of the Planning and Development Act 2000, as amended. The Variation is required to integrate the changes in national and regional policy, to integrate the Transition Population Projections and to revise the overall county Settlement Hierarchy contained in the Project Ireland 2040; National Planning Framework (‘NPF’), the Implementation Roadmap for the National Planning Framework and the Eastern and Midland Regional Assembly (EMRA) Regional Spatial and Economic Strategy (RSES).

The NPF was published on 16 February 2018 and sets out a course for planning and development in Ireland. The NPF was adopted on 29 May 2018 and was further supported by the publication of the Implementation Roadmap for the National Planning Framework (‘Roadmap’) which was published on 3 July 2018. This document confirmed that the NPF was adopted as a strategy to replace the National Spatial Strategy (2002-2020, NSS) and advised that the NPF is of direct relevance to the preparation of Regional Spatial and Economic Strategies and County Development Plans.

The hierarchy of the planning process within Ireland is summarised in the flow chart depicted Figure 1.1 and described in Section 1.2.1 – 1.2.4.

The flow chart (adapted from the Department of Environment, Heritage and Local Government (DoEHLG) Development Plan Guidelines for Planning Authorities (2007)) indicates where the Variation falls within that hierarchy.

This planning hierarchy was taken into account in drafting the Variation and undertaking this SEA.

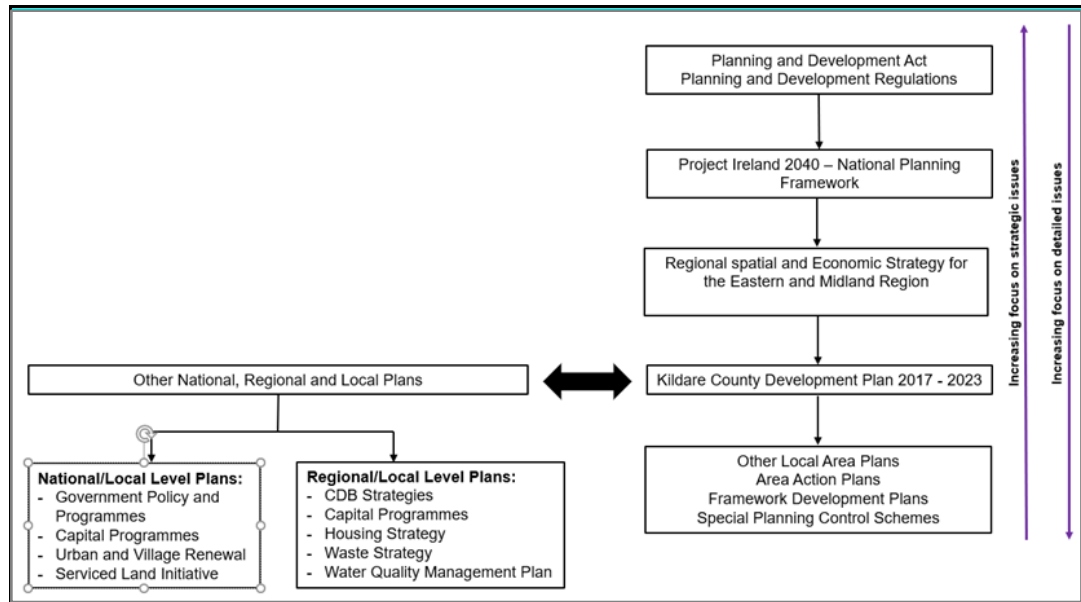


Figure 1.1: Hierarchy of the Planning Process in Ireland

2.2.1 Project Ireland 2040: National Planning Framework

The Department of Housing, Planning and Local Government published Project Ireland 2040: National Planning Framework (NPF) in February 2018. The NPF is the overarching policy and planning framework for the social, economic and cultural development of the country.

The NPF was published together with a 10-year national investment plan as one vision – Project Ireland 2040, meaning that implementation of the NPF is fully supported by the Government’s investment strategy for public capital investment and investment by the State sector in general.

The NPF is the overarching document guiding regional spatial and economic strategies and local development plans. The NPF identifies national strategic outcomes (including the sustainable management of water and other environmental resources) as well as strategic investment priorities.

The Variation is required to integrate changes in national policy and to account for revised population forecasts contained in the Project Ireland 2040; National Planning Framework. The NPF is the overall Plan from which other, more detailed plans will take their lead, hence the title, National Planning ‘Framework’, including city and county development plans and regional strategies.

The National Planning Framework will be a tool to assist the achievement of more effective regional development. The National Planning Framework also has statutory backing.

The National Planning Framework (NPF) focuses on ten strategic outcomes:

- Compact Growth
- Enhanced regional accessibility
- Strengthened Rural Economies and Communities
- Sustainable Mobility
- A strong economy, supported by Enterprise, Innovation and Skills
- High quality international connectivity
- Enhanced amenity and heritage
- Transition to a low carbon and climate resilient society
- Sustainable management of water and other environmental resources
- Access to quality childcare, education and health services.

(Ref: *Project Ireland 2040, Building Ireland's Future*).

The NPF provides for substantially better linkage between zoning of land and the availability of infrastructure in local authority planning. The NPF outlines the requirements for a new, standardised methodology to be put in place for core strategies which will also address issues such as the differentiation between zoned land that is available for development and zoned land that requires significant further investment in services for infrastructure for development to be realised. It is a long-term strategy which acknowledges that achieving the proposed targets will take time and their implementation will need to be adaptive to the inevitable changes in circumstances and unforeseen events inherent in a long-run Framework approach.

The NPF outlines a number of National Policy Objectives relating to the coordination of land-use zoning and the provision of infrastructure and services.

National Policy Objective 72a states:

“Planning authorities will be required to apply a standardised, tiered approach to differentiate between i) zoned land that is serviced and ii) zoned land that is serviceable within the life of the plan.”

National Policy Objective 72b states:

“When considering zoning lands for development purposes that require investment in service infrastructure, planning authorities will make a reasonable estimate of the full cost of delivery of the specified services and prepare a report, detailing the estimated cost at draft and final plan stages.”

National Policy Objective 72c states:

“When considering zoning land for development purposes that cannot be serviced within the life of the relevant plan, such lands should not be zoned for development.”

In order to facilitate monitoring and review, phased regional population targets to 2026 and 2031 are set out in Table 10.1 of the NPF and more specific (per County) in Appendix 1 of the Roadmap (and subsequently in Appendix B of the RSES). The Roadmap highlights the differences between what many County Development Plans are currently making provision for and likely outcomes on the ground, based on more realistic and deliverable NPF/NDP projections highlighting a significant gap that the County Development Plan review or Variation process’ must now start to bridge.

These transitional population projections plot a growth trajectory set approximately mid-way between what is currently being planned for in statutory Development Plans if projected forward to 2031, and the more likely evidence based and nationally coherent projected scenario to 2031 and 2040. These ‘adjusted’ transitional figures will apply to 2026 and will inform the period to 2031. These population projections have been replicated in the RSES and the Act now requires local authorities to now vary their CDPs for the purposes of enabling the incorporation of the NPF and RSES in to their development plans. The Roadmap states that the transitional level of growth to 2026 will provide sufficient scope to enable City and County Development Plans to be reviewed, land zonings to be prioritised and Local Area Plans and planning permissions to be worked through, while also allowing for agility and ambition, as well as monitoring and review.

The objectives of the NPF has been applied on a regional basis through statutory Regional Spatial and Economic Strategies (RSESs), see Section 1.2.2. The RSESs must accord with the NPF and in turn, local authority development plans which address further detailed local matters, must be in accordance with the RSESs.

2.2.2 Regional Spatial and Economic Strategy (RSES) for the Eastern and Midland Region 2019-2031

In October 2018, the Eastern and Midland Regional Assembly prepared a draft Regional Spatial and Economic Strategy for the whole of the Eastern and Midland Region for the period 2019-2031, as required under section 24(4) of the Planning and Development Acts 2000-2018. As outlined in Section 1.2.1, the RSES for the Eastern and Midland Region replaced the RPGs, which came into effect in June 2019.

The RSES for the Eastern and Midland Region, is a strategic plan which identifies regional assets, opportunities and pressures, and provides appropriate policy responses in the form of Regional Policy Objectives. At this strategic level it provides a framework for investment to better manage spatial planning and economic development throughout the Region.

The RSES provides a:

- **Spatial Strategy** – to manage future growth and ensure the creation of healthy and attractive places to live, work, study, visit and invest in.
- **Economic Strategy** – that builds on our strengths to sustain a strong economy and support the creation of quality jobs that ensure a good living standard for all.
- **Metropolitan Plan** – to ensure a supply of strategic development areas for the sustainable growth and continued success and competitiveness of the Dublin metropolitan area.
- **Investment Framework** – to prioritise the delivery of key enabling infrastructure and services by government and state agencies.
- **Climate Action Strategy** – to accelerate climate action, ensure a clean and healthy environment and to promote sustainable transport and strategic green infrastructure.

The National Planning Framework (as detailed in Section 1.2.1) was adopted as a strategy to replace the National Spatial Strategy (2002-2020, NSS) and advised that the NPF is of direct relevance to the preparation of Regional Spatial and Economic Strategies and County Development Plans. One of the key reasons the Government has put in place the NPF is to shape and coordinate planning, economic and spatial development and infrastructure investment at national, regional and local levels, through the Regional Spatial and Economic Strategies (RSEs), currently being prepared by the three Regional Assemblies, and City and County Development Plans and Local Area Plans.

Following the recent process regarding the adoption of the RSES for the Eastern & Midlands Region, it was considered by the Department that there was a need to put in place a mechanism to ensure:

- a) Local Authority Development Plan review processes underway within the RSES finalisation period could be paused until such time as they could benefit from the latest data and policy contexts from the RSES; and
- b) Recently adopted plans, which ordinarily last for six years, would be brought forward for review or Variation.

As the Kildare CDP review was only adopted in February 2017, a Variation of the Plan is the appropriate approach as advised.

2.2.3 Kildare County Development Plan 2017-2023

The County Development Plan has been varied in light of the changes in national and regional policy, the changes required to the Core Strategy to integrate the Transitional Population Projections into the County Plan and revisions to the overall county Settlement Hierarchy as a result of the adoption of the National Planning Framework (NPF) and the Eastern and Midlands Regional Spatial and Economic Strategy 2019-2031 (RSES).

The capacity of settlements in Kildare to accommodate the level of growth envisaged by the RSES and to deliver sustainable communities that are well served by social and physical infrastructure are carefully considered as part of the Variation to the Kildare County process for the growth towns.

In order to develop in a sustainable manner, the towns must accommodate the appropriate levels of residential, economic, recreational and community development in tandem with necessary improvements in physical infrastructure and public transport.

The Variation will amend the CDP to align with the transitional set of population projections, outlined in Section 1.2.1. It is of importance to note that the population projection is significantly less than what the current plan provides for and adjustments will be required accordingly. The CDP population target is 253,552 persons to 2023, whereas the NPF and RSES 'high-end' population target is set at 254,000 to 2026. This has consequential reductions to population and housing targets for all towns, villages and settlements across the county. Whilst it is acknowledged that the RSES does state that neither the NPF or Roadmap seek down zoning of land, they do however require the application of development land prioritisation measures (rather than de-zoning) where a surplus of lands is identified in existing plans with regard to the NPF Roadmap up to 2031. It is of relevance to note that the current Kildare County Development Plan in Volume 2 provides explicit objectives in relation to the phased development of lands within these villages (VSR 2 and VSR6) and it is therefore not necessary to address these issues in the Variation. The issue of integrating development land prioritisation measures to land-use zonings is addressed primarily through the preparation of mandatory Local Area Plans for the 12 towns of Naas, Maynooth, Athy, Kildare Town, Kilcullen, Newbridge, Sallins, Leixlip, Kilcock, Monasterevin, Celbridge and Clane.

The Variation fundamentally addresses amendments to the Settlement Strategy of the current CDP (Table 3.3) and reduces proportionally (in accordance with the previously adopted percentage allocation) each of the town's population and housing targets.

In addition, a number of new National Regional Policy Objectives relate to settlement designations, climate change and strategic employment development areas.

2.3 Interaction with other relevant plans and programmes

As part of the SEA process the context of the Variation must be established with regard to other plans and programmes that have been adopted at International, National, Regional and Local level. In particular the interaction of the Development Plan with the environmental protection objectives and standards included within these other plans and programmes must be considered.

A wide range of legislation, plans and programmes are of relevance to the Variation and are outlined in **Table 1.1**.

Table 1.1: Hierarchy of Relevant Legislation, Plans and Programmes

Level	Legislation, Plans and Programmes
International/EU Level	Water Framework Directive & associated Directives SEA Directive Floods Directive Groundwater Directive Habitats Directive Birds Directive Freshwater Fish Directive Shell fish Directive Drinking Water Directive Bathing Water Directive Environmental Impact Assessment Directive Seveso Directive Sewage Sludge Directive Urban Waste Water Treatment Directive Waste Framework Directive Nitrates Directive Soils Directive Air Quality Directives including Framework Directive National Emissions Ceiling Directive Environmental Noise Directive Climate Change Programme (ECCP II) Intergovernmental Panel on Climate Change (IPCC) Industrial Emissions Directive EU Reach Initiative European Landscape Convention UN Convention of Biological Diversity, 1992 Kyoto Protocol Stockholm Convention Valetta Convention Ramsar Convention OSPAR Convention Granada Convention Gothenburg Strategy
National Level	A Programme for Partnership Government 2016 Building on Recovery: Infrastructure and Capital Investment 2016 - 2021 Policy Position on Climate Action and Low-Carbon Development. National Policy Position Ireland (2014) Delivering a Sustainable Energy Future for Ireland - The Energy Policy Framework 2007 - 2020 National Energy Efficiency Action Plan 2013 - 2020 National Spatial Strategy 2002 - 2020 Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities (2015)

Level	Legislation, Plans and Programmes
	<p>Quality Housing for Sustainable Communities. Best Practice Guidelines for Delivering Homes Sustaining Communities (2007)</p> <p>The Planning System and Flood Risk Management. Guidelines for Planning Authorities (2009)</p> <p>Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas (Cities, Towns & Villages) (2009)</p> <p>Guidelines for Planning Authorities – Retail Planning (2012)</p> <p>Local Area Plans - Guidelines for Planning Authorities (2013)</p> <p>Guidelines for Planning Authorities – Spatial Planning and National Roads (2012)</p> <p>Our Sustainable Future – A Framework for Sustainable Development for Ireland (2012)</p> <p>Actions for Biodiversity 2011 - 2016 (2nd National Biodiversity Plan)</p> <p>Draft 3rd National Biodiversity Strategy and Action Plan (2016)</p> <p>Appropriate Assessment of Plans and Projects in Ireland. Guidelines for Planning Authorities (revised 2010)</p> <p>Architectural Heritage Protection - Guidelines for Planning Authorities (2004)</p> <p>Guidelines for Planning Authorities - Retail Planning (2012)</p> <p>Government Policy on Architecture 2009 - 2015</p> <p>National Policy on Town Defences (2008)</p> <p>Implementation of Regional Planning Guidelines Best Practice Guidance (2010)</p> <p>Irish Water’s Capital Investment Plan,</p> <p>Irish Water’s Water Services Strategic Plan</p> <p>River Basin Management Plan for Ireland 2018 - 2021</p> <p>Climate Action Plan 2019 (2019)</p> <p>National Development Plan 2018 - 2027 (2018)</p> <p>Project Ireland 2040: National Planning Framework (2018)</p> <p>National Mitigation Plan (2017)</p> <p>National Implementation Plan 2018 - 2020 (2018)</p>
Regional Level	<p>Eastern and Midlands Regional Spatial & Economic Strategy 2019-2031</p> <p>Regional Planning Guidelines for the Greater Dublin Area 2010-2022</p> <p>Retail Strategy for the Greater Dublin Area 2008-2016</p> <p>Transport Strategy for the Greater Dublin Area up to 2035</p> <p>River Basin Management Plan for Ireland 2018-2021</p> <p>Eastern-Midlands Region Waste Management Plan 2015-2021</p> <p>Eastern Catchment Flood Risk Assessment Management (CFRAM) Study</p> <p>Flood Risk Management Plans</p> <p>Groundwater Protection Schemes</p>
Local Level	<p>Kildare County Development Plan 2017-2023</p> <p>South East Draft Flood Risk Management Plans (2016)</p> <p>County Kildare Heritage Plan 2019 2025</p> <p>County Kildare Biodiversity Action Plan 2009-2014</p> <p>Other Local Area Plans</p>

3 Variation No. 1 to the Kildare County Development Plan

3.1 Introduction

Kildare County Council has prepared a Variation of the County Development Plan (CDP) 2017-2023. The County Development Plan has been varied in light of the significant changes required to the Core Strategy and consequential changes to other parts of the CDP as a result of the adoption of the National Planning Framework (NPF) and the Eastern and Midlands Regional Spatial and Economic Strategy 2019-2031 (RSES).

The formal notice of the Variation of the CDP was issued in January 2020. The Variation, from the date of publication of the notice to vary the CDP to adoption of the Variation, took six months to complete (there were no Material Alterations sought). The extent of the Variation of the CDP has been extended to the integration of the changes in national and regional policy into the Kildare County Development Plan 2017-2023, the integration of the Transitional Population Projections contained in the NPF Implementation Roadmap and revisions to the overall country Settlement Hierarchy. The current Kildare County Development Plan 2017-2023 was subject to SEA, AA and SFRA. A copy of the Kildare County Development Plan, Environmental Report, Appropriate Assessment Report and Strategic Flood Risk Assessment is available at www.kildare.ie/countycouncil.

3.2 Development Plan in Context

The NPF is a long-term strategy and sets out broad national, regional and city-specific population targets to secure more effective regional development. The strategy itself acknowledges that achieving these targets will take time and their implementation will need to be adaptive to the inevitable changes in circumstances and unforeseen events inherent in a long-run Framework approach. Therefore, in order to facilitate monitoring and review, phased regional population targets to 2026 and 2031 are set out in Table 10.1 of the NPF and more specific (per County) in Appendix 1 of the Roadmap and subsequently in Appendix B of the RSES. The Roadmap highlights the differences between what many County Development Plans are currently making provision for and likely outcomes on the ground, based on more realistic and deliverable NPF/NDP projections highlighting a gap that the RSES and County Development Plan review or Variation process' must now start to bridge.

In order to assist Regional and Local Authorities in addressing this gap, the Roadmap provides a transitional set of population projections to inform City and County Development Plans for the periods to 2026 and 2031.

It is advised that these projections provide for a transitional approach to delivering better alignment between the plans at the different levels to provide a more coherent approach to identifying and providing for future development

requirements in terms of housing, employment, schools, water services and public transport provision.

These transitional population projections plot a growth trajectory set approximately mid-way between what is currently being planned for in statutory Development Plans if projected forward to 2031, and the more likely evidence based and nationally coherent projected scenario to 2031 and 2040. These ‘adjusted’ transitional figures will apply to 2026 and will inform the period to 2031.

The figures above have been replicated in the RSES (which came into effect in June 2019) and the Act now requires local authorities to now vary their CDPs for the purposes of enabling the incorporation of the NPF and RSES in to their development plans. The Roadmap states that the transitional level of growth to 2026 will provide sufficient scope to enable City and County Development Plans to be reviewed, land zonings to be prioritised and Local Area Plans and planning permissions to be worked through, while also allowing for agility and ambition, as well as monitoring and review.

3.3 Variation

The Variation amends the CDP to align with the revised figures set out above. It is of importance to note that the population projection is less than what the current plan provides for and adjustments will be required accordingly, as outlined in Section 1.2.

The Variation fundamentally addresses amendments to the Settlement Strategy of the current CDP (Table 3.3) and reduces proportionally (in accordance with the previously adopted percentage allocation) each of the town’s population and housing targets.

In addition, a number of new National Regional Policy Objectives relate to settlement designations, climate change and strategic employment development areas.

4 SEA Methodology

4.1 Introduction

The objectives of the Strategic Environmental Assessment (SEA) Directive is ‘to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans ... with a view to promoting sustainable development’ (Article 1 SEA Directive). It is a systematic, on-going process for evaluating, at the earliest possible stage, the environmental quality and consequences of implementing certain plans and programmes on the environment.

The requirements for SEA in Ireland are set out in the national legislation as follows:

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

This section highlights how the SEA has been undertaken for the Variation. The SEA methodology is based on legislative requirements and relevant Environmental Protection Agency (EPA) guidance and will ensure compliance with the SEA Directive and associated legislation. The EPA’s SEA Pack (Version 18/04/2013) was also used as a source of information during the scoping process. The key stages outlined in **Figure 3.1** were identified and are discussed in the following sections.

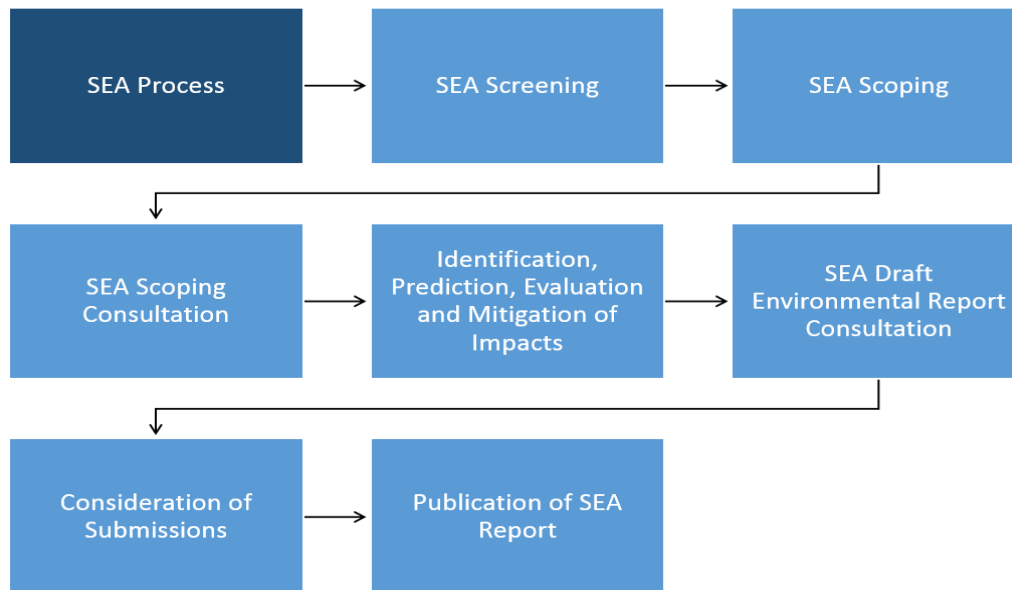


Figure 3.1: Key Stages of the SEA Process

4.2 Screening

The screening process allowed Kildare County Council to identify at the earliest possible opportunity whether the development of the Variation required an SEA and facilitated the assessment findings to be factored into the Variation development process.

The legal requirements of the plan-making process are set out in national legislation and guidelines and in particular:

- Planning and Development Act 2000 (as amended); and
- Planning and Development Regulations 2001 (as amended).

It is considered that an SEA is required for the purposes of the Variation, due to the following:

The characteristics of the Variation having regard to ‘the degree to which the plan sets a framework for projects and other activities, either with regard to the location, nature, size and operating conditions or by allocating resources’.

- A number of new policy objectives relate to settlement designations and strategic employment development areas.

The characteristics of the Variation having regard to ‘the degree to which the plan influences other plans, including those in a hierarchy’.

- The issue of integrating development land prioritisation measures to land-use zonings will be addressed primarily through the preparation of mandatory Local Area Plans for the 12 towns of Naas, Maynooth, Athy, Kildare Town, Kilcullen, Newbridge, Sallins, Leixlip, Kilcock, Monasterevin, Celbridge and Clane.

4.3 Scoping

The main objective of the scoping stage is to identify the key environmental issues that may arise as a result of the Variation to the CDP, so they may be addressed appropriately in the Environmental Report. There are a number of tasks at this stage:

- Determine the key elements of the Variation to be assessed;
- Determine the environmental issues to be assessed;
- Collect and report on relevant international, national and local plans, objectives and environmental standards that may influence or impact on the Variation;
- Develop environmental objectives, indicators and targets to allow the evaluation of impacts.
- Identify reasonable alternative means of achieving revised population forecasts contained in NPF.

A scoping report was prepared as part of this SEA on behalf of Kildare County Council which asked key questions of statutory consultees and key stakeholders. The responses received were addressed in the preparation of the Environmental Report. A summary of the responses received to the Scoping Report, and corresponding action taken is included in **Table 3.1** below.

Table 3.1: Summary of Scoping Responses

Organisation	Summary of Scoping Response	Action
EPA	<p><i>Planning Policy Context-</i> You should ensure that the Variation is consistent with the National Planning Framework – Ireland 2040 (NPF), as well as the forthcoming Regional Spatial and Economic Strategy (RSES) for the Eastern and Midlands Region, upon adoption</p> <p><i>Critical Infrastructure Provision-</i> Consideration should be given to critical infrastructure provision in the context of industrial developments and urban expansion in Key Towns which will significantly increase both energy and water needs in their locality.</p> <p><i>Noise-</i> The scoping report refers to the Noise Action Plan. Note that the Round 3 Strategic Noise Mapping is now completed.</p> <p><i>Other Plans & Programmes -</i> Regarding the list of other relevant plans and programmes in Table 3.1, you should note that:</p> <ul style="list-style-type: none"> - the 3rd National Biodiversity Plan was adopted in 2017; - the National Spatial Strategy has been replaced by NPF. <p>The Department of Transport Tourism and Sport ‘Smarter Travel – A Sustainable Transport Future – Transport Policy for Ireland 2009-2020’ (DTTAS, 2009), transport-related actions in the National Mitigation Plan, Climate Action Plan 2019 and the National Planning Framework should all be considered.</p> <p>In considering additional development and growth of settlements within the County, it is critical that development be closely linked to the ability to provide a safe and secure supply of drinking water and related critical service infrastructure.</p>	<p>Due regard was had to the provisions of the NPF and the RSES during the plan making process.</p> <p>As described in Chapter 7 of the CDP, upgrades to the transmission network to serve these major industrial connections are provided for in the CDP. KCC intends to promote the ongoing upgrade and expansion of critical infrastructure and services to meet the future needs of the County.</p> <p>Kildare County Council have recently prepared the 3rd Noise Action Plan for Kildare; to be adopted following a period of public consultation.</p> <p>The plans and programmes referenced and considered as part of the SEA process have been updated to include those suggested by the EPA in their submission. The <i>State of the Environment Report Ireland’s Environment – An Assessment 2016 (EPA, 2016)</i> report was also considered.</p> <p>KCC will have had regard to existing conditions regarding road schemes in the area potential cumulative impacts on the traffic network in the County. In the undertaking of the SEA, due regard was had to TII’s Environmental Assessment and Construction Guidelines, the Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (National Roads Authority, 2006), and the Environmental Noise Regulations 2006.</p> <p>As outlined in Chapter 5 of the CDP, it is the policy of the Council to work in conjunction with Irish Water to protect existing water and wastewater infrastructure in County Kildare, to maximise the potential of existing capacity and to facilitate the timely delivery of water services infrastructure to facilitate future growth. KCC has committed to support Irish Water, in addressing issues where water supplies servicing the County are included on the ‘Remedial Action List’ (RAL).</p>

Organisation	Summary of Scoping Response	Action
	<p>The Variation should comply fully with The Planning System and Flood Risk Management - Guidelines for Planning Authorities (OPW/DEHLG, 2009).</p> <p>Radon concentrations in the County should be taken into account.</p> <p>The outcomes from the Healthy Ireland Outcomes Framework should also be considered.</p> <p>Other key recent plans to consider include:</p> <ul style="list-style-type: none"> - National Mitigation Plan; - National Adaptation Framework; - Paris Agreement; - Guidelines on Urban Development and Building Heights for Local Authorities; - National Landscape Strategy; - National Greenways Strategy; - National Clean Air Strategy (DCCAIE); - Draft National Energy and Climate Plan; - Regional Waste Management Plan; - Draft Integrated Implementation Plan 2019-2024 (NTA); - National Water Resources Plan (Irish Water, in prep); - Planning, Land Use and Transport – Outlook 2040 (DTTAS, in prep). <p><i>State of the Environment Report – Ireland’s Environment 2016</i> - In preparing the Plan and SEA, the recommendations, key issues and challenges described within our most recent State of the Environment Report Ireland’s Environment – An Assessment 2016 (EPA, 2016) should be considered, as relevant and appropriate to the Variation.</p>	<p>As described in Chapter 2, CS16 of the CDP, it is the policy of KCC to protect environmental quality in the County through the implementation of European, national and regional policy and legislation relating to air quality, greenhouse gases, climate change, light pollution, noise pollution and waste management.</p>

Organisation	Summary of Scoping Response	Action
	<p><i>Transition to a low carbon climate resilient economy and society-</i> You should ensure that the Variation aligns with national commitments on climate change mitigation and adaptation, as well as relevant sectoral, regional and local adaptation plans. Energy conservation and renewable energy should be considered where relevant.</p> <p><i>EPA SEA Search and Reporting Tool</i> -This tool allows public authorities to explore, interrogate and produce high level environmental summary reports. It is intended to assist in screening and scoping exercises. The tool is available through <i>EPA WFD Application</i> -Our WFD Application provides a single point of access to water quality and catchment data from the national WFD monitoring programme. The Application is accessed through EDEN and is available to public agencies. Publicly available data can be accessed via the <i>Catchments.ie</i> website.</p>	

4.4 Baseline Data

Gathering relevant information relating to the state of the environment for a plan area is an integral part of the SEA process. The SEA Directive requires that certain information relating to the relevant environmental baseline is presented in order to help test the performance of the plan's implementation, as well as helping establish how the environment would change if the plan were not to implemented.

Baseline information has been collected from readily available sources, and a Geographical Information System (GIS) was used to graphically present relevant information. The baseline information is reported in Section 4 of this report.

4.5 Environmental Assessment of the Variation

The SEA process is informed by the environmental baseline (i.e. the current state of the environment) to facilitate the identification and evaluation of the likely significant environmental effects of implementing the provisions of the Variation and the alternatives and the subsequent monitoring of the effects of implementing the provisions of the Variation as adopted.

4.6 Consultations

This SEA Environmental Report was issued to the relevant statutory stakeholders for comment. The responses received were addressed in the finalisation of the Environmental Report. An outline of the responses received is included in the SEA Statement.

Consultation with representatives of Kildare County Council also took place throughout the SEA process.

4.7 Consideration of Alternatives

The SEA Directive requires that reasonable alternatives be assessed in order to demonstrate how the preferred strategy performs against other forms of action. Alternatives must be developed, described and assessed within the SEA process, with the results presented in the Environmental Report.

Section 5 of this Environmental Report discusses the consideration of alternatives.

4.8 Technical Difficulties Encountered

No major technical difficulties were encountered during the preparation of this Environmental Report.

5 Current State of the Environment

Note all figures referenced from this point onwards are included in **Appendix A1**.

5.1 Introduction

Article 5 of the SEA Directive, in accordance with the established European principle of subsidiarity, states that the Environmental report shall include the information that may reasonably be required taking into account:

Current knowledge and methods of assessment;

- The contents and level of detail in the plan or programme and its stage in the decision-making process; and
- The extent to which certain matters are more appropriately assessed at different levels in that process in order to avoid duplication of the assessment.

In this context, the information identified is relevant to lower tier planning and project development and associated environmental assessments.

Given the potential for impacts beyond the boundary of the County boundary, the spatial scope of the SEA takes into account the zone of influence (15km or greater where relevant) of the County boundary.

County Kildare is located in the Mid-East Region in Ireland. It is completely inland and bordering Dublin. The County's close proximity and easy access to Dublin has resulted in large scale residential, commercial and industrial development, and the rapid expansion of the same.

The dominant environments across the County are improved grassland (for agriculture), urban, built land and forest/woodland (mixed and broad leaved) and bog and wet lands. The three prominent water bodies located in Kildare are the River Liffey, the River Barrow and the River Boyne. These rivers along with their tributaries, smaller rivers, lakes and reservoirs are an important part of Kildare's landscape and natural heritage.

Kildare has geographically varied population density. The northeast of the County has significantly higher population density with the largest towns located in this same vicinity – including Naas, Maynooth, Leixlip, Newbridge and Celbridge. Population growth is expected across the County with the percentage of the population residing in the County's towns and villages planned to increase while the proportion living in rural countryside is expected to reduce.

Kildare has a widespread transport network with many of the main transportation corridors linking Dublin to the rest of the country passing through the County. Many residents of Kildare commute for employment with Dublin being the primary commuter destination. The improvement of public transport service and availability to the main centres of employment and retail is essential to improving accessibility in County Kildare.

According to the EPA's State of the Environment Report, 2016, Ireland's environment remains in a good condition, although there are a number of key challenges in the coming years. The report identified four priority challenges for the environment, which comprise; valuing and protecting our natural environment; building a resource-efficient low-carbon economy; putting the environment at the centre of our decision making and implementing environmental legislation.

In the EPA's 2020 Vision document it is noted that pressures on the Irish environment increased significantly as a result of a decade of rapid and unprecedented economic growth. Unfortunately, these pressures have accelerated at a rate that far exceeds that observed in other EU countries.

In '2020 Vision', the EPA promotes six environmental goals which consider the principal environmental challenges facing our nation. These goals, which are highly relevant to the sustainable development of Kildare County and environs have a bearing on the assessment of the Variation:

- Limiting and adapting to climate change;
- Clean air;
- Protected waters;
- Protected soils and biodiversity;
- Sustainable use of natural resources; and
- Integration and enforcement.

These goals are identified as a means of realising the vision of protecting and improving Ireland's environment.

5.2 Purpose of the Environmental Baseline

The assessment of the Variation with respect to the current environmental baseline is the principal task of this SEA process.

Consequently, the baseline description must be cognisant of the local level nature of the plan and the pressures and interrelationships between environmental topics.

The environmental baseline provides an overview of the existing conditions in County Kildare relevant to the Variation and covers the following environmental topics:

- Biodiversity;
- Population and Human Health;
- Land and Soils;
- Water;
- Air, Noise and Climate;
- Archaeological, Architectural and Cultural Heritage;

- Landscape and Visual;
- Material Assets.

5.3 Population and Human Health

5.3.1 Population

According to Census 2016 data, the population of Kildare County was 222,504. This is 4.7% of the State total (4.76 million) and 9.5% of the Eastern & Midlands Regional Assembly (2.32 million). The population has increased by 5.8% (or 10,595) since 2011.

Kildare has geographically varied population density with the northeast of the county having by far the highest population densities.

The NPF Implementation Roadmap and RSES population projections for the County for the periods 2026 and 2031 have been adjusted to the end of the first quarter of 2023, to coincide with the life of this Plan. The population projection for Kildare to the end of the Plan period is 239,367, giving rise to the need for 6,023 additional residential units by 2023. The percentage of the population residing in the County's towns and villages is planned to increase while the proportion living in rural countryside is expected to reduce. **Table 4.1** identifies dwelling targets for the year 2023 as per the NPF Roadmap population projections, as included in the Variation.

Table 4.1: Population and Housing Targets for Co. Kildare

Census 2016 Population ¹	Census 2016 Dwellings	NPF 2026 Population Growth (with 25% increase)	NPF 2026 growth target in units	Population growth 2020 to 2023 ²	Dwellings Target 2020 to 2023 ²
222,504	80,158	39,370	14,060	16,863	6,023

5.3.2 Human Health

The concept of health has been defined by the World Health Organisation as “... a state of complete physical, psychological and social well-being, and not simply the absence of disease or infirmity.” Health is influenced by many factors in the social and built environment including housing, employment status, education, transport and access to fresh food and resources, as well as the impacts of air quality, water quality, flooding and access to green space.

¹ NPF implementation Roadmap rounded the population figure down.

² Taken from Chapter 3 Section 3.5 Table 3.3 of the Variation

Good planning can play an important role in reducing health inequalities. The World Health Organisation's Commission on the Social Determinants of Health (CSDH) states governments should '*ensure urban planning promotes healthy and safe behaviours equitably, through investment in active transport, retail planning to manage access to unhealthy foods, and through good environmental design and regulatory controls, including control of the number of alcohol outlets*'.

Given the strong links between income and health, it is recognised that the sustainability of current and future economic activity is an important element in protecting and promoting population health. However, emphasising economic growth without due regard for social and environmental consequences of such growth can have negative impacts on health both for the population as a whole and for groups within the population.

Even within areas of economic development, job creation does not necessarily 'trickle down' to job opportunities for the long-term unemployed, and is neither a sufficient, nor necessary, condition for reducing long-term unemployment.

Thus, economic development needs to be targeted, geographically and within population groups to ensure that it reduces and does not exacerbate social inequalities.

Cognisance must also be paid to environmental issues and sustainability endeavours to protect human health as the local economy develops. While employment is generally good for health, there can be negative impacts, usually related to the quality of the working environment and type of work undertaken.

The level of green space and access to the natural environment is extremely important for the populace health. The health and wellbeing of individuals is greatly affected by the communities in which they live and the nature of their physical environment. A key element of sustainable communities is access to space as environments which lack public gathering places can encourage sedentary living habits. Open space provision can improve levels of exercise in a community which can impact on health and can improve social interaction and community activities which can contribute to reducing stress-related problems.

Availability of spatial data on human health is limited. A key area for consideration of human health will be the interaction between environmental aspects such as water, landscape, biodiversity, air, and energy and human beings.

The Kildare CDP sets out the Council's policies and objectives relating to the provision of health services in the county. It is the policy of the Council, for example, '*to respond to current and future health needs to support healthy communities across the county and to facilitate and enable a multiagency approach to service delivery in community settings*'.

According to the Kildare Socio-Economic Baseline Report (2015) some 90.4% of Kildare's population report their health status as good/very good. This is higher than both the State and regional figures." These results are the fourth highest in the country and higher than both the State average (88.3%) and the Eastern & Southern region (88.5%). Only 1.3% of the total population identified themselves as having Bad or Very Bad health which is the 7th lowest in the country.

The greatest health risk from radiation in Ireland is caused by radon, which accounts for more than half of the total radiation dose received by the Irish population. As a known carcinogen, in the same category as tobacco smoke and asbestos it is a cause of lung cancer. Up to 250 cases of lung cancer in Ireland every year can be linked to radon. These lung cancer cases are principally associated with exposure to radon in the home, but exposure in the workplace is also a contributor. In the workplace, the employer must protect the health of workers from this identifiable risk.

Certain areas of the country are more likely to have a high number of homes with excessive levels of radon and these areas are known as High Radon Areas. They can be found on the radon map of Ireland. The map was produced from a national survey of approximately 11,000 homes. In addition to the map, statistics for the number of homes above the national Reference Level are available for each county in Ireland.

The Government's Building Regulations require that all new homes in High Radon Area are installed with a Radon Barrier. According to the EPA Radon Map, some 20% (approx.) of land cover in Kildare County is classified as a 'High Radon Area.' Most of these 'High Radon Areas' are located in the South East of the county.

The Control of Major-Accident Hazards Involving Dangerous Substance ("SEVESO") III Directive: 2012/18/EU came into effect in Ireland on 1st June 2015, replacing the Seveso II Directive 96/82/EC. Article 13 of the new Directive requires member states to ensure that the objectives of preventing major accidents and limiting the consequences of such accidents are taken into account in land use policies and/or other relevant policies. These objectives must be pursued through controls on the following:

- The siting of new establishments; and
- Modifications to existing establishments.

New developments including transport routes, locations of public use and residential areas in the vicinity of establishments, where the siting or developments may be the source of or increase the risk or consequences of a major accident. There are two sites in County Kildare that are listed as coming under the SEVESO III Directive, as shown in **Table 4.2**.

Table 4.2: Industries in County Kildare regulated by the SEVESO III Directive

Name	Location	Tier
Irish Industrial Explosives	Clonagh, Enfield	Upper Tier
Intel Ireland	Collinstown Industrial Park, Leixlip	Upper Tier

The assessment of impacts on human health will reference other sections of the SEA as relevant along with considering aspects such as the Industrial Emissions Directive, the SEVESO Directive and Flood Risk Assessments. This will ensure that all relevant vectors through which human health impacts could be caused as a result of the Variation are assessed.

5.4 Biodiversity

The Convention on Biological Diversity defines biodiversity as “the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part.” This includes sites, habitats, species and networks of importance at the international, national or local level, and which may occur within or outside the Plan area.

The term biodiversity refers to more than individual species. It includes the genes they contain, the habitats and ecosystems of which they form part, and also highlights the interdependence and interconnectedness of all living things.

The main elements of biodiversity are:

- European (Natura 2000) sites (SACs and SPAs, and candidate SACs and SPAs);
- NHAs, National Parks, Nature Reserves, Wildfowl Sanctuaries, Refuges for Fauna or Flora or sites proposed for designation;
- Undesignated sites such as proposed NHAs (pNHAs), local biodiversity areas;
- Sites and habitats that can be considered to be corridors or stepping stones for the purpose of Article 10 of the Habitats Directive;
- ‘Natural habitats and protected species for the purposes of the Environmental Liability Directive, including habitats and species listed under the Habitats Directive (Annex I habitats, Annex II and Annex IV species and their habitats) and Birds Directives (Annex I species and their habitats, and regularly occurring migratory birds) wherever they occur;
- Legally protected species including protected flora under the European Communities (Birds and Natural Habitats) Regulations 2011 and Wildlife Acts 1976-2000;
- Sites identified under the Bern, Ramsar and Bonn Conventions; and
- Biodiversity in general including habitats important for birds, red listed and BoCCI listed species, natural and semi-natural habitat areas including wetlands, woodlands, waterbodies, etc.

Natural heritage in County Kildare includes a wide range of natural features that make an essential contribution to the environmental quality, ecological biodiversity, landscape character, visual amenity and recreational activities across the County.

The Kildare County Biodiversity Plan provides a framework for conserving biodiversity and natural heritage at a local level. It complements the Kildare Heritage Plan by including detailed actions to deliver positive outcomes focused on species and habitats.

The dominant environments across Kildare County are improved grassland (for agriculture), urban, built land and forest/woodland (mixed and broad leaved) and bog and wet lands.

For this reason, it is important to ensure that local biodiversity areas, which form an important part of the County's Green Infrastructure and support connectivity within the network, are maintained, and given the opportunity to increase their distribution.

There are several important watercourses located across the county meaning that water contributes significantly to Kildare's natural heritage. County Kildare falls into the catchments of the Liffey, the Barrow and the Boyne. These rivers and their associated tributaries and lakes support good areas of biodiversity.

The occurrence of natural vegetation adjacent to these water corridors also makes important contributions in terms of landscape character and ecology/biodiversity.

The habitats of ecological importance present within Kildare County were noted as:

- **Woodland and Scrub Habitats:** There are areas of woodland particularly along linear corridors such as the Rye Water, The Liffey and the River Barrow. The woodlands provide areas of bio-diverse habitat with many native species of trees and significant vegetation connectivity across the County.
- **Mixed & Broad-Leaved Forest Habitats:** There are number of forest habitats located throughout the County particularly to the North of the County. These forest habits provide significant areas for biodiversity, including areas for endangered species such as red squirrels. Examples of forest habitats in Kildare are Kilteel Wood, Derryvullagh Wood and Killinthomas Wood.
- **Hedgerow and Treeline Habitats:** Hedgerows form part of an extensive wildlife network across Kildare County and contribute to the maintenance of habitat links across urban environments. Hedgerows can also provide roosting posts for bats.
- **Watercourse Habitats:** There are a number of habitats associated with the watercourses throughout County Kildare. The main rivers along with their tributaries, lakes, reservoirs, canals and streams support a wide range of habitats and bio-diversity. The three main rivers that flow through Kildare are the Barrow, the Liffey and the Boyne.

These rivers support habitats for fish including trout and salmon. The Barrow is designated as a site of international nature conservation importance due to the diverse range of habitats that occur in and along the river including some endangered species. The Royal and Grand Canals are both designated proposed Natural Heritage Areas supporting rich wildlife.

- **The Grand and Royal Canal Corridors Habitats:** The Grand Canal and the Royal Canal are extensive water corridors that flow through the county. There is natural vegetation, coniferous and mixed plantations adjacent to the water corridors including fringing wetlands and towpath grasslands. The areas are underdeveloped in some locations due to the difficulty for the existing topography to visually absorb development, allowing bio-diversity to flourish.
- **The River Liffey Valley and the River Barrow Valley Habitats:** The River Liffey and River Barrow valleys are of significance as they are sensitive to development due to the extensive upland views.

They are characterised by smooth terrain and low vegetation. Shelter vegetation exists along some stretches of the valleys with the presence of natural and native woodland that grows on the floodplains of the rivers, as well as by conifer plantation in adjacent lands, providing important habitat for bio-diversity due to the underdevelopment of these areas.

- **Agricultural Land with Natural Vegetation Habitats:** extensive areas of grassland within farmland areas located across the County particularly in the East and Midlands. These cultivated, arable farmlands along with any associated natural vegetation provide excellent habitats that support widespread habitat connectivity.
- **The Curragh and Environs Habitat:** The Curragh is the largest area of unenclosed natural grassland in the country and provides a valuable amenity area for the surrounding towns of Kildare, Newbridge and Kilcullen. It consists of an extensive open plain area of lowland acidic grassland, succeeding to dry heath in places, remaining unfertilised for hundreds (perhaps thousands) of years. This has given rise to unusual habitats in both an Irish and European context making it an important conservation area. Nationally important populations of rare fungi are found which only occur in ancient grasslands. It is a Special Area of Conservation (SAC).
- **Pollardstown Fen Habitat:** Pollardstown Fen is situated on the northern margin of the Curragh lying in a shallow depression, running in a north-west/south-east direction. Pollardstown Fen is the largest remaining calcareous spring-fed fen in Ireland. It has a unique fen ecosystem that holds international importance due to containing endangered plant communities. It is a Special Area of Conservation (SAC).
- **Thermal Springs Habitats:** There are numbers of thermal springs in Kildare including springs with tufa formation known as calcareous springs which are recognised as priority habitat for nature conservation. Thermal springs have their own distinctive fauna with species that are adapted to the warm conditions. Thermal springs in Kildare include Louise Bridge near Leixlip (SAC), St. Patricks Well, Morrinstown and Sunday's Well.
- **East Kildare Uplands Habitats:** The East Kildare Uplands are rural in character with a number of scenic views from elevated vantage points. The general land use is defined as pasture, with some tillage, quarrying and forestry allowing for diverse habitats and ecology.
- **Grassland Habitats:** The less intensively-managed grasslands, improved grasslands and grasslands on lime-rich soils often support a larger diversity of grasses, wildflowers and invertebrates than intensively managed grasslands. These types of grasslands are becoming increasingly rare and only survive in areas that are inaccessible or unsuitable for cultivation. Semi-natural grasslands can be found in some commonage areas, on cutaway bogland, along road margins, canal banks and abandoned quarries.
- **Peatland Habitats:** Kildare contains large tracts of peatland and the two main types are raised bogs and fens. Peat is of an acidic nature and when in wet conditions results in deep accumulation creating environments suitable for unique flora and fauna including many types of sphagnum moss.

Raised bogs support a variety of plants that can cope with the wet and acidic conditions including the insect-eating sundews. These sites have international significance due to their scarcity on a world-wide scale. Bogs and fens create habitats suitable for dragonflies, damselflies and butterflies including some endangered species. Fens are also particularly important for breeding and wintering birds. The Irish Peatland Conservation Council (IPCC) owns and manages a number of peatlands for conservation and runs The Bog of Allen Nature Centre in Kildare.

- **Man-Made Habitats:** There are many man-made habitats within Kildare County that serve as important biodiversity areas. These include gardens, parks, graveyards, amenity walks, railway lines and patches of woodland and scrub. These man-made green areas provide habitats for a range of wildlife including various bird species, invertebrates, such as bees and butterflies and various small mammals. The hedgerows and vegetation allow for a network of green spaces, providing continuity between habitats, or ‘stepping stone habitats’, so the different species can move between these areas.
- **Urban Environments:** Buildings and artificial surfaces are present across the County and, for the most part, were noted to support little or no ecologically-valuable flora. However, some urban areas can be found to host a variety of flora and fauna particularly in green spaces, hedgerows and waste-ground. For example, foxes have become increasingly visible in urban areas.

Kildare is home to several rare, protected and/or threatened flora and fauna. The natural habitats and species across the County are under pressure from many threats including development, urban expansion, pollution, alien invasive species, habitat loss and fragmentation, peat extraction, inappropriate management and climate change. Protected plants are those that are legally protected under the Flora Protection Order within the Wildlife (Amendment) Act 2000 (e.g., Opposite leaved Pondweed, Basil Thyme or Hairy St. John’s-wort). Various animals are also afforded protection within the Wildlife Acts (e.g., all native mammals). Species listed on Annex II of the European Union Habitats Directive (e.g., Otters, White-clawed Crayfish, Marsh Fritillary Butterfly) or Annex I of the EU Birds Directive (e.g., Golden Plover, Kingfisher) are also protected.

The County supports a range of rare, threatened and endangered plant, animal and bird species under European and Irish legislation. 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 - 2012, the Birds Directive 1979, the Flora Protection Order and the Habitats Directive 1992 are adequately protected.

The Liffey and several of its tributaries are exceptional in the area in supporting Atlantic salmon (*Salmo salar*, listed under Annex II and V of the EU Habitats Directive) and Sea trout (*Salmo trutta*) in addition to resident Brown trout (*Salmo trutta*) populations. This highlights the sensitivity of local watercourses and the Liffey catchment in general.

The Kildare Bat Group and Bat Conservation Ireland carry out a bat surveys around the County.

Of the nine confirmed resident species of bats in Ireland seven have been recorded and confirmed in County Kildare. All bat species are protected under Annex IV of the EU Habitats Directive, while the lesser horseshoe bat is listed under Annex II. Member states are required to designate Special Areas of Conservation for all species listed under Annex II in order to protect them.

There is a high population of Otters in Kildare in particular along the Barrow and the Liffey. The number of otters in Europe have declined rapidly causing them to be a protected species under European legislation making the Irish population particularly important.

White-Clawed Crayfish are found in the River Barrow as well as in small headwater tributaries and in lakes. White-Clawed Crayfish are regarded as a keystone species, they are widespread across much of Ireland and populations have not declined to the extent that they have in other parts of Europe.

Marsh Fritillary Butterfly has been recorded in areas of natural grassland sites in Kildare that have been established on cutover peatlands. It is recognised as one of the most endangered species in Europe and efforts are being made to conserve the species in Kildare.

Butterfly Conservation Ireland is a new conservation body based in Kildare that is dedicated to saving butterflies and moths. They manage an area of cutover bog for conservation purposes.

5.4.1 Invasive Species

Alien species are plants or animals that have been introduced, usually by people, outside their natural range. Alien species can sometimes become ‘invasive’ when they spread rapidly and outcompete the native flora and fauna, pushing out native species and/or leading to environmental degradation. Invasive species present one of the greatest threats to biodiversity worldwide. Invasive species can be particularly problematic in aquatic systems. They can have a negative effect on recreational and amenity use of waterways, as well as threatening native ecosystems.

It is the policy of the Council to support measures for the prevention and eradication of invasive species within the county.

According to the National Biodiversity Data Centre, there are records of a number of invasive species in County Kildare. These invasive species include: Curly leaved waterweed, Japanese Knotweed and Variegated yellow archangel, the Canadian Waterweed, Himalayan Balsam, American Mink, Grey Squirrel and Jenkin’s Spire Snail – among others.

It is required by the Council as part of the planning application process, the eradication/control of invasive introduced species including Japanese Knotweed, when identified on a site or in the vicinity of a site, in accordance with Regulation 49 of the European Communities (Birds and Natural Habitats) Regulations 2011 to 2015.

5.4.2 Designated Sites

There are a range of statutory provisions in force in Ireland to protect, conserve and manage our natural heritage, and to control and regulate human activities that may impact upon it negatively. The Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs is responsible, through the National Parks and Wildlife Service (NPWS), for the designation of conservation sites in Ireland. Currently there are three main types of designation of protected areas- Special Areas of Conservation, Special Protection Areas and National Heritage Areas.

Designated conservation sites within 15km of the study area are illustrated on **Figure 4.1**. A distance of 15km is currently recommended in the case of plans, deriving from UK guidance (Scott Wilson et al., 2006), and is therefore applied in this assessment.

Special Areas of Conservation (SACs) have been selected for protection under the European Council Directive on the conservation of natural habitats and of wild fauna and flora (92/43/EEC) by the Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs due to their conservation value for habitats and species of importance in the European Union. There are six SACs in County Kildare.

Special Protection Areas (SPAs) have been selected for protection under the 1979 European Council Directive on the Conservation of Wild Birds (79/409/EEC) by the Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs due to their conservation value for birds of importance in the European Union. There is one SPA in County Kildare.

All SACs/SPAs of relevance to the Variation are outlined in Table 4.3 (within County Kildare) and Table 4.4 (15km from the county boundary). A brief summary of each of the designated sites is also provided.

Table 4.3: Natura 2000 sites within County Kildare

Site Code	Site Name	Qualifying Features (QIs)
391	Ballynafagh Bog SAC	<ul style="list-style-type: none"> • Active raised bogs • Degraded raised bogs still capable of natural regeneration • Depressions on peat substrates of the Rhynchosporion
396	Pollardstown Fen SAC	<ul style="list-style-type: none"> • Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> • Petrifying springs with tufa formation (<i>Cratoneurion</i>) • Alkaline fens • <i>Vertigo geyeri</i> • <i>Vertigo angustior</i> • <i>Vertigo moulinsiana</i>
397	RedBog, Kildare SAC	<ul style="list-style-type: none"> • Transition mires and quaking bogs • Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i>-type vegetation • Active raised bogs
1387	Ballynafagh Lake SAC	<ul style="list-style-type: none"> • Alkaline fens • Transition mires and quaking bogs • <i>Vertigo moulinsiana</i> • <i>Euphydryas aurinia</i>

Site Code	Site Name	Qualifying Features (QIs)
2162	River Barrow and River Nore SAC	<ul style="list-style-type: none"> • Estuaries • Mudflats and sandflats not covered by seawater at low tide • Salicornia and other annuals colonising mud and sand • Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) • Mediterranean salt meadows (<i>Juncetalia maritimi</i>) • Water courses of plain to montane levels with the <i>Ranuncion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation • European dry heaths • Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels • Petrifying springs with tufa formation (<i>Cratoneurion</i>) • Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles • Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) • <i>Spartina</i> swards (<i>Spartinion maritima</i>) • Allis shad (<i>Alosa alosa</i>) • Atlantic salmon (<i>Salmo salar</i>) • Brook lamprey (<i>Lampetra planeri</i>) • Desmoulin's whorl snail (<i>Vertigo moulinsiana</i>) • Freshwater Pearl Mussel (<i>Margaritifera margaritifera</i>) • Killarney Fern (<i>Trichomanes speciosum</i>) • Freshwater Pearl Mussel (<i>Margaritifera durrovensis</i>) • Otter (<i>Lutra lutra</i>) • European river lamprey (<i>Lampetra fluviatilis</i>) • Twait shad (<i>Alosa fallax</i>) • White clawed crayfish (<i>Austropotamobius pallipes</i>)
2331	Mouds Bog SAC	<ul style="list-style-type: none"> • Active raised bogs • Degraded raised bogs still capable of natural regeneration • Depressions on peat substrates of the <i>Rhynchosporion</i>
4063	Poulaphouca Reservoir SPA	<ul style="list-style-type: none"> • Greylag Goose (<i>Anser anser</i>) • Lesser Black-backed Gull (<i>Larus fuscus</i>)

There are eleven additional SACs identified as being within 15km of the County border which is of relevance to the preparation of the Variation.

Table 4.4: Natura 2000 Sites within 15km of the County boundary

Site Code	Site Name	Distance from County Boundary (m)	Qualifying Features (QIs)
781	Slaney River Valley SAC	1640	<ul style="list-style-type: none"> • Estuaries; • Floating river vegetation; • Old oak woodlands; • Residual alluvial forests*; • Tidal mudflats; • Atlantic Salmon (<i>Salmo salar</i>); • Brook Lamprey (<i>Lampetra planeri</i>); • Common Seal (<i>Phoca vitulina</i>); • Freshwater Pearl Mussel (<i>Margaritifera margaritifera</i>); • Otter (<i>Lutra lutra</i>); • River Lamprey (<i>Lampetra fluviatilis</i>); • Sea Lamprey (<i>Petromyzon marinus</i>); • Twaite Shad (<i>Alosa fallax</i>)
925	The Long Derries, Edenderry SAC	610	<ul style="list-style-type: none"> • Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco Brometalia</i>) (*important orchid sites)
1209	Glenasmole Valley SAC	6480	<ul style="list-style-type: none"> • Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco Brometalia</i>) (*important orchid sites) • Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) • Petrifying springs with tufa formation (<i>Cratoneurion</i>)
2122	Wicklow Mountains SAC	3320	<ul style="list-style-type: none"> • Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i> • Natural dystrophic lakes and ponds • Northern Atlantic wet heaths with <i>Erica tetralix</i> • European dry heaths • Alpine and Boreal heaths • Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) • Blanket bogs (* if active bog) • Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsetalia ladani</i>) • Calcareous rocky slopes with chasmophytic vegetation • Siliceous rocky slopes with chasmophytic vegetation • Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles • <i>Lutra</i>
1757	Holdenstown Bog SAC	3040	<ul style="list-style-type: none"> • Transition mires and quaking bogs
2141	Mountmellick SAC	8730	<ul style="list-style-type: none"> • <i>Vertigo moulinsiana</i>
2256	Ballyprior	2790	<ul style="list-style-type: none"> • Semi-natural dry grasslands and scrubland

Site Code	Site Name	Distance from County Boundary (m)	Qualifying Features (QIs)
	Grassland SAC		facies on calcareous substrates (Festuco Brometalia)(*important orchid sites)
2299	River Boyne and River Blackwater SAC	390	<ul style="list-style-type: none"> • Alkaline fens • Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae) • <i>Lampetra fluviatilis</i> • <i>Salmo salar</i> • <i>Lutra</i>
2342	Mount Hevey Bog SAC	4130	<ul style="list-style-type: none"> • Active raised bogs • Degraded raised bogs still capable of natural regeneration • Depressions on peat substrates of the Rhynchosporion
4040	Wicklow Mountains SPA	5720	<ul style="list-style-type: none"> • Merlin <i>Falco columbarius</i> • Peregrine <i>Falco peregrinus</i>
4232	River Boyne and River Blackwater SPA	370	<ul style="list-style-type: none"> • Kingfisher <i>Alcedo atthis</i>

Natural Heritage Areas (NHAs) are designated due to their national conservation value for ecological and/or geological/geomorphological heritage. They cover nationally important semi-natural and natural habitats, landforms or geomorphological features, wildlife plant and animal species or a diversity of these natural attributes. NHAs are designated under the Wildlife (Amendment) Act 2000. Proposed NHAs were published on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. There are 24 NHAs in County Kildare as listed in **Table 4.5**.

Table 4.5: Natural Heritage Areas in County Kildare

Site Name	Site Code
Carbury Bog	001388
Hodgestown Bog	001393
Ballina Bog	000390
Corballis Hills	001389
Curragh	000392
Derryvullagh Island	001390
Donadea Wood	001391
Dunlavin Marshes	001772
Grand Canal	002104
Kilteel Wood	001394
Liffey at Osberstown	001395
Liffey Bank at Athgarvan	001396
Liffey Valley Meander Belt	000393

Site Name	Site Code
Mouds Bog	000395
Oakpark	000810
Pollardstown Fen	000396
Poulaphouca Reservoir	000731
Red Bog	000397
Royal Canal	002103
Ballynafagh Bog	000391
Ballynafagh Lake	001387
Barrow Valley at Tankardstown	000858
Rye Water Valley / Carton	001398

Proposed Natural Heritage Areas (pNHAs) have not been formally proposed or designated but these sites are still of significance for wildlife and habitats. A process is underway to resurvey and formally designate some pNHAs as NHAs. There are 22 pNHAs located within the County boundary.

Table 4.6: Proposed Natural Heritage Areas in County Kildare

Site Name	Site Code
Ballina Bog	000390
Ballynafagh Bog	000391
Curragh (Kildare)	000392
Liffey Valley Meander Belt	000393
Mouds Bog	000395
Pollardstown Fen	000396
Red Bog, Kildare	000397
Poulaphouca Reservoir	000731
Oakpark	000810
Barrow Valley at Tankardstown Bridge	000858
Ballynafagh Lake	001387
Corballis Hill	001389
Derryvullagh Island	001390
Donadea Wood	001391
Kilteel Wood	001394
Liffey At Osberstown	001395
Liffey Bank Above Athgarvan	001396
Rye Water Valley/Carlton	001398
Dunlavin Marshes	001772
Royal Canal	002103
Grand Canal	002104

5.5 Land and Soil

Soils in any area are the result of the interaction of various factors, such as parent material, climate, vegetation and human action. Soil types, as classified by Teagasc in cooperation with the Forest Service, EPA and GSI are mapped on Figure 4.2. In Kildare County there are variety of different soil types that support a number of uses including agriculture.

Subsoils in the County are primarily made up of Limestone dominated till and Limestone sands and gravels. A strip of sandstone dominated till runs down the eastern County boundary. Large expanses of Cutaway Peat are evident in the north and west of the County.

Alluvium, marl and lake sediments are dispersed throughout the County. These soils may indicate the current or historic flood plains of the County's various rivers and lakes.

The soil type in the north east of the County has been identified as being predominantly 'Urban' or 'Made Ground'. Made ground consists of materials modified by people, including those associated with mineral exploitation and waste disposal. They include materials deposited as a result of human activities or geological material modified artificially so that their physical properties (structure, cohesion and compaction) have been drastically altered.

Given the urban nature of certain areas and the range of land use activities which have taken place historically, soils may have been contaminated to some degree in the past in certain areas. Such contamination has the potential to affect water quality, biodiversity and flora and fauna and human health. The County Development Plan 2017-2023 includes provisions in relation to environmental protection and degraded/contaminated lands.

In 2005, the Council in partnership with the Irish Geological Heritage Programme of the Geological Survey of Ireland, assessed the geological heritage of Kildare and identified the 20 of the most important sites which are worthy of protection as County 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.

The locations of 20 County Geological Sites within County Kildare are mapped on **Figure 4.4** and listed in **Table 4.7**.

Table 4.7: Kildare County Geological Sites

Site Name	Geological Interest	Location
Chair of Kildare	Precambrian – Devonian Palaeontology	Carricknearla, Conlanstown, Cannonstown
Dunmurry Hill	Precambrian – Devonian Palaeontology	Dunmurry
Hill of Allen	Cambrian-Silurian	Barnacrow
Slate Quarries	Cambrian-Silurian	Slate Quarries
Ballysax	Quaternary	Curragh

Site Name	Geological Interest	Location
Glen Ding	Quaternary	Blessington, Athgarrett, NewtownGreat, Newtown Park
Pollardstown Fen and Springs	Quaternary	Scarlettstown, Roseberry, Rathbride, Cornelscourt
Moorhill	Quaternary	Kilcullen
The Curragh	Quaternary	St. Ledgers Bottoms
Ballykane Hill	Lower Carboniferous	Kilrainy
Carbury Castle	Lower Carboniferous	Carbury
Carrick Hill, Edenderry	Lower Carboniferous	Carrick
Liffey Oxbow	Fluvial/Lacustrine Geomorphology	Celbridge
Liffey Valley	Fluvial/Lacustrine Geomorphology	Ballymore Eustace-Kilcullen
Kilbrook Spring	Hydrogeology	Kilbrook
Louisa Bridge Springs (Cold and Warm)	Hydrogeology	Leixlip
St Brigid's Well – Japanese Gardens	Hydrogeology	Kildare
St. Patrick's Well	Hydrogeology	Barrettstown, Naas
St. Patrick's Well	Hydrogeology	Ardrass Lower
St. Peter's Well	Hydrogeology	Dunmurragehill

The Waste Management (Facility Permit and Registration) Regulations, S.I. No. 821 of 2007 (as amended) has transferred to the National Waste Collection Permit Office (NWCPO). There are 25 registered waste facilities in Kildare County as registered under the Environmental Protection Agency. All sites are landfill, and most are located in the mid to North East of the County.

5.6 Water

5.6.1 Hydrology

Approximately 94% of the water supply to the county comes from outside Kildare – primarily from regional plants at Ballymore Eustace (Dublin City Council) and Leixlip (Fingal County Council). Kildare is served by circa 37 wastewater treatment plants. The largest wastewater treatment plants are located at Osberstown and Leixlip. Wastewater collection and treatment capacity has struggled to keep pace with development and many networks and plants in the county are operating at capacity.

Human activities, if not properly managed, can cause deterioration in water quality. Pressures exerted by human activities include: sewage and other effluents discharged to waterways from point sources, discharges arising from diffuse or dispersed activities on land, abstractions from waters and structural alterations to water bodies.

Examples of significant point source pressures include direct discharges from waste water treatment plants, licensed discharges from industrial activities, landfills, contaminated lands (e.g. disused gas works) and mines.

Significant examples of diffuse pressures include runoff from forestry and agricultural lands. Excessive abstractions from surface waters and groundwater for drinking and industrial purposes can create pressures on the ability of a water body to maintain both chemical and ecological status. Structural alterations such as river straightening; construction of embankments, weirs, dams, port facilities and dredging can create conditions such that a water body is no longer able to support the natural ecology.

The three main rivers that flow through Kildare are the Barrow, the Liffey and the Boyne, along with other small rivers and tributaries. The River Barrow catchment which includes the main channel and tributaries such as the Rivers Slate, Figile, Athy, Tully, and Greese is the largest catchment in the County. Other catchments include those of the Boyne and Liffey.

The River Barrow rises in the Slieve Bloom mountains in Co. Laois and is joined by the Nore approximately 4km upstream of New Ross. The River is tidal up to St. Mullin's. The Barrow flows in a north easterly direction and runs for 192km. The Barrow meets The Black River in the town of Monasterevin in County Kildare.

The River Liffey rises in the Wicklow Mountains, about 32km southwest of Dublin, and flows in a generally north-westerly direction from its source to the Lackan Reservoir. The river then runs westward in the Kildare lowland and gradually turns north-westward to Droichead Nua and northeast to Celbridge and Leixlip. It then flows eastward through the city of Dublin, in which it is extensively canalized and bordered with quays. It drains to Dublin Bay, an arm of the Irish Sea, after a course of 50 miles (80 km).

The River Boyne has its source near Newbury Hall in County Kildare. The main channel is some 113km with north-west of the County included in the catchment area. The River Boyne flows northeast through County Meath, where it enters the Irish Sea right between County Meath and County Louth at Momington, east of Drogheda.

There are a number of lakes and reservoirs in the County including the Poulaphouca, Leixlip Liffey and Golden Falls reservoirs and Redbog Lake. The Zone of Influence of the Variation beyond the County area with respect to impacts upon waters can be estimated to be all bodies of groundwater and all surface waters downstream areas of catchments which drain the County.

The Water Framework Directive

Since 2000, Water Management in the EU has been directed by the Water Framework Directive 2000/60/EC (WFD).

The WFD has been transposed into Irish legislation by the European Communities (Water Policy) Regulations 2003 (SI No. 722 of 2003) and requires that all member states implement the necessary measures to prevent deterioration of the status of all waters - surface, ground, estuarine and coastal - and protect, enhance and restore all waters with the aim of achieving good status by 2015.

Ireland is required to produce a river basin management plan under the WFD.

In April 2018 the Government of Ireland published the River Basin Management Plan for Ireland 2018-2021. The Plan sets out the actions that Ireland will take to improve water quality and achieve ‘good’ ecological status in water bodies (rivers, lakes, estuaries and coastal waters) by 2027. Water quality in Ireland has deteriorated over the past two decades. The Variation provides a more coordinated framework for improving the quality of our waters — to protect public health, the environment, water amenities and to sustain water-intensive industries, including agri-food and tourism, particularly in rural Ireland.

As part of the implementation of the EU Water Framework Directive 2000/60/EC (WFD) a baseline risk assessment was completed of the water bodies in Ireland. These assessments were made using water pollution indicators, point and diffuse pollution sources, water abstractions and detail on commercial activities.

The risk assessment assigned a water quality status to each waterbody and indicated a risk status namely, whether the water body would meet the criteria for “good status” or would be considered “at risk” of not meeting the standards by 2015.

The County is located within the Eastern and South Eastern River Basin Districts. The Local Authorities located in the RBDs have prepared River Basin Management Plans. The Eastern RBD Plan has been adopted. The Management Plans provide objectives for river basins in order to implement the requirements of the WFD to help protect and improve all waters in the RBDs.

The largest catchment in the County is the Barrow catchment which drains the south west of the County and includes the Barrow River and all of its tributaries. This catchment is generally a mixture good or moderate status.

The north east of the County forms part of the Liffey catchment which includes the River Liffey and its tributaries. The waters in the Liffey catchment are generally classified as being of poor or good status. Poulaphouca Reservoir is located within the Liffey catchment and partially in County Kildare. This lake is the only lake in Kildare attributed with a status (it is identified as being of moderate status). Downstream of County Kildare, the Liffey catchment includes a various bathing waters at Dublin Bay.

The north-eastern corner of the County forms part of the Boyne – waters here are generally classified as being of poor or moderate status.

Osberstown, north-east to the town centre of Naas, has been identified as a designated sensitive area under the Urban Waste Water Treatment Directive (91/271/EEC). This is due to concerns of excessive leaks/spills of waste water from the collection system at the location.

Surface water features in Kildare County are shown on **Figure 4.5**. The WFD Quality Status 2010-2015 for Rivers and Lakes within the County are shown in **Figure 4.6** and the WFD Risk Status for Rivers and Lakes within the County is shown on **Figure 4.7**.

5.6.2 Hydrogeology

Groundwater is stored in the void spaces in underground layers of rock, or aquifers. These aquifers are permeable, allowing both the infiltration of water from the soils above them and the yielding of water to surface and coastal waters.

Groundwater protection within the County is carried out through the County's Groundwater Protection Scheme which has been undertaken jointly between the Geological Survey of Ireland and Kildare County Council. The purpose of the scheme is to preserve the quality of groundwater, particularly for drinking water purposes, for the benefit of present and future generations. The scheme identifies the vulnerability of areas within the County and Groundwater protection responses for existing and new potentially polluting activities.

Groundwater is generally identified as being of good status however the Curragh Gravels West groundwater catchment is identified as being of poor status.

Groundwater Vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities. Groundwater is most at risk where the subsoils are absent or thin and, in areas of karstic limestone, where surface streams sink underground at swallow holes.

Groundwater underlying County Kildare is mainly classed as Medium to High. Other areas are classified as having extreme and low groundwater vulnerability.

The GSI rates aquifers based on the hydrogeological characteristics and on the value of the groundwater resource. Ireland's entire land surface is divided into nine aquifer categories. Groundwater Productivity rates the value of the groundwater resource. The predominant categorisation in County Kildare and is Locally Important Sand/Gravel Aquifers. These types of aquifers are capable of yielding enough water to boreholes or springs to supply domestic, commercial and industrial uses, depending on the nature and scale of the development. Two large areas of Locally Important Aquifers – Generally Moderately Productive are identified in the north west of the County.

The most productive aquifers in the County - *Regionally Important Karstified Aquifers* – are found only in a small area in the south of the County.

Regionally Important Karstified Aquifers – Dominated by Diffuse Flow are found in the west of the County and run through to the centre.

Poor Bedrock Aquifers - which are generally unproductive - are found in the east of the County these are interspersed with areas that are *productive in local zones*.

Register of Protected Areas (RPAs) in County Kildare, by virtue of how their waters are used by people, include stretches of rivers supplying waters intended for human consumption – these are protected already under the Drinking Water Regulations (S.I. 439/2000). Other RPAs include downstream bathing waters in the Liffey catchment.

An unusual feature of the groundwater regime in County Kildare is the formation of warm springs.

Calcareous springs with tufa formation are recognised by the European Union as a priority habitat for nature conservation under the EU Habitats Directive. There are six sites recognised by The Geological Survey of Ireland (GSI), in partnership with the National Parks and Wildlife Service, as having hydrogeological importance. Those sites include Kilbrook Spring, Louisa Bridge Springs (Cold and Warm), St. Brigid's Well -Japanese Gardens, St. Patrick's Well (1), St. Patrick's Well and St. Peter's Well.

Groundwater features and source protection zones in the County are shown in **Figure 4.8**. Groundwater vulnerability in the County is shown in **Figure 4.9**. WFD Groundwater quality and risk status' in the County is shown in **Figure 4.10** and **Figure 4.11**.

5.6.2.1 Flooding

Flooding is an environmental phenomenon which, as well have causing economic and social impacts, could in certain circumstances pose a risk to human health.

The main sources of flood risk within County Kildare are fluvial (from rivers/streams) and pluvial (from rainwater).

Measures such as Strategic Green Infrastructure planning will assist in meeting statutory obligations under EU directives and national legislation, including the Water Frameworks and Floods Directive.

Sustainable Urban Drainage Systems (SuDS) drain surface water in an environmentally friendly way by replicating natural systems in managed environments. SuDS systems seek to collect, store and release surface water back to the environment using natural systems in a slow and controlled way, thereby reducing the risk of fluvial and pluvial flooding.

The County Development Plan has undergone Strategic Flood Risk Assessment (SFRA) in response to requirements contained in The Planning System and Flood Risk Management Guidelines for Planning Authorities (DEHLG/OPW, 2009).

The SFRA has also been informed by modelled information on flood risk from the Office of Public Works which has been prepared as part of the Catchment Flood Risk Assessment and Management (CFRAM) Studies. County Kildare falls within two CFRAM Studies, the Eastern CFRAM and the South Eastern CFRAM. The two CFRAM Studies identified Areas for Further assessment (AFAs), which through the National CFRAM Programme will be assessed by a flood risk management plan. The designation of AFAs took into account flood risk AFAs and comprise the following settlements: Allenwood, Athy, Castledermot, Celbridge, Clane, Hazelhatch, Johnstownbridge, Kilcock, Leixlip, Maynooth, Monasterevin, Naas, Newbridge, Rathangan, Suncroft, Turnings/Killeenmore.

5.7 Air, Noise and Climate

5.7.1 Air Quality

In order to protect human health, vegetation and ecosystems, EU Directives set down air quality standards in Ireland and the other Member States for a wide variety of pollutants. These pollutants are generated through fuel combustion, in space heating, traffic, electricity generation and industry and, in sufficient amounts, could affect the well-being of the areas inhabitants. The EU Directives include details regarding how ambient air quality should be monitored, assessed and managed.

The EPA measures the levels of a number of atmospheric pollutants throughout Ireland in order to measure compliance with Air Quality Standards Regulations, 2011 (S.I. No. 180 of 2011). For the purposes of monitoring in Ireland, four zones are defined in the Regulations:

- Zone A: Dublin Conurbation;
- Zone B: Cork Conurbation;
- Zone C: Other Cities and Large Towns; and
- Zone D: Rural Ireland which is the remainder of the State excluding Zones A, B and C.

Newbridge, Naas, Leixlip and Celbridge are located within Zone C while the rest of the County is located within Zone D.

The Air quality in Zone C and Zone D as reported in the EPA 2018 report ‘Air Quality in Ireland 2017’ is summarised in **Table 4.8** below. In rural areas (Zone D) some of the quantities were too low to be measurable.

Table 4.8: Air Quality Assessment Zone C and Zone D Concentrations compared to Air Quality Standards

Parameter	Zone C: Average measured concentration ($\mu\text{g}/\text{m}^3$)	Zone D: Average measured concentration ($\mu\text{g}/\text{m}^3$)	Air quality standard ($\mu\text{g}/\text{m}^3$)
NO ₂	11.8	7.5	40
SO ₂	2.9	2.3	20
CO	0.15	n/a	10
Ozone	53.05	50.8	120
PM ₁₀	15.8	10.6	40
PM _{2.5}	10.6	9.1	20
Benzene	0.18	n/a	5

The Environmental Protection Agency manages the National Ambient Air Quality Network.

This Network sets legislative limit and target values for protection of human health and vegetation. According to the ‘Air Quality in Ireland Report 2017’ no levels above the EU limit values were recorded in Ireland in 2017.

The EPA 2017 dioxin Survey shows that concentrations of dioxins and similar pollutants remain at a consistently low level in the Irish environment.

5.7.2 Noise

The Environmental Noise Directive (END) (2002/49/EC) requires that action is taken by each member state, with a view to preventing and reducing environmental noise where necessary (particularly where exposure levels can induce harmful effects on human health) and to preserving environmental acoustic quality where it is good. The relevant local authorities have been designated by the Environmental Noise Regulations, S.I. Regulations No. 140 of 2006, as the bodies charged with development and making of ‘Noise Action Plans’.

Kildare County Council prepared the second Noise Action Plan for County Kildare in 2013. This Noise Action Plan primarily considers the long term environmental noise impact from road, rail and air traffic noise sources, and sets out an approach to review noise impact levels near to the major sources assessed during the strategic noise mapping in 2012 with a view to identifying locations where noise reduction is deemed necessary in the first instance. In County Kildare, there are no major agglomerations or major airports subject to noise mapping or action planning.

Strategic Noise Maps have been prepared for all roads deemed to fall within the threshold of 3 million vehicles a year. The total length of identified major roads included within the strategic noise mapping was 258 km which amounts to 10.2% of the total road network which is relatively large compared to other counties. This broke down into 157 km of motorways and national roads, 94.4 km of regional roads and 6.4 km of local road.

The Noise Action Plan addressed a number of sections of ‘Major Roadway’ that are located within Kildare County which qualified for noise mapping and, as such were subject to consideration for action planning.

Kildare Local Authorities and Transport Infrastructure Ireland identified the extent of “Major Roads” using traffic count data to identify any sections of motorways, national roads or regional roads with more than 3 million vehicle passages per year

The total length of “Major Roads” (as defined in the Regulations included within the strategic noise mapping was 235 km. The “Major Roads” are categorised into:

1. 108 km of Motorways,
2. 9 km of National Roads,
3. 112 km of Regional Roads, and
4. 7 km of Local Roads

In Kildare the motorways identified and included within the strategic noise mapping are outlined in **Table 4.9**.

Table 4.9: Lengths of Motorways in Kildare designated as ‘Major Roads’

Motorway	Approximate Length (km)
M4	32.7
M7	36.4
M9	38.5

In Kildare the major national roads identified and included within the strategic noise mapping are outlined in **Table 4.10**.

Table 4.10: Lengths of National Roads in Kildare designated as ‘Major Roads’

National Road	Approximate Length (km)
N7	8.5
N81	0.5

Regional Roads classified as “Major Roads” either in total or in part are outlined in **Table 4.11**.

Table 4.11: Lengths of Regional Roads in Kildare designated as ‘Major Roads’

Regional Road and Location	Approximate Length (km)
R125	1
R148	16
R149	1.3
R158	0.7
R403	14.4
R405	2.5
R406	6.8
R407	20.5
R410	3
R413	2.8
R415	0.5
R416	4.4
R445	21
R447	4.4
R448	7.2
R449	5

Local Roads classified as “Major Roads” either in total or in part are outlined in **Table 4.12**.

Table 4.12: Lengths of Local Roads in Kildare designated as ‘Major Roads’

Local Road and Location	Approximate Length (km)
L203	4.30
L204	0.9
L301	0.2
L407	0.7
L507	0.9

Mapping involved estimating noise levels at and adjacent to the “Major Roads” detailed above. In the context of the noise action plan this refers to all areas exposed to noise from the “Major Roads” above a level of L_{den} 55 dB(A) and L_{night} 50 dB(A).

Iarnród Éireann (Irish Rail) identified that the extent of “Major Railways” had increased in the County from Cherryville Junction near Kildare Town to the Laois border by approximately 10.00 km. The length of major railway in Kildare is approximately 45.00 km. Iarnród Éireann (Irish Rail) developed the Strategic Noise Mapping for the “Major Railways” in the County.

In County Kildare there are no “Agglomerations” or “Major Airports.”

The plan concludes that there are an estimated 969 people in Kildare above the L_{den} threshold for noise from road traffic sources, and an estimated 5564 people above the L_{night} threshold – 3,674 from road traffic sources and 1,890 from rail traffic sources.

Proposals for residential developments near busy roads in urban areas may be required to show how it is proposed that impacts of noise are mitigated. A Noise Impact Assessment along with noise screening measures such as facade insulation and noise barriers should form part of proposals, as appropriate.

The general approach to be taken by Kildare County Council in managing environmental noise in the area involves:

- Noise reduction at source;
- Land use planning adapted to noise goals;
- Procedures to reduce noise impact; and
- Operating restrictions to reduce noise emissions.

Kildare County Council has developed a detailed Programme of Works for the duration of the Noise Action Plan (2013 to 2018) and proposed to implement the programme subject to the availability of the requisite technical staff, expertise and financial resources.

5.7.2.1 Climate

The existing climate for County Kildare corresponds with the general climatic conditions for the whole country which is dominated by the Atlantic Ocean and its air and oceanic currents. Consequently, the region does not suffer from extremes of temperature. According to Met Éireann, average annual temperature is about 9°C. Mean annual wind speed varies between about 4 m/sec in the east midlands and 7 m/sec in the northwest.

Average rainfall varies between about 800 and 2,800 mm. Rainfall accumulation tends to be highest in winter and lowest in early summer.

According to the United Nations Integrated Panel on Climate Change, in line with the global picture, Ireland's average temperature has increased by about 0.7°C over the last 100 years, and the rate of increase has been higher in the last couple of decades. The increase has not been uniform over time, with a warming period from 1910 to the 1940s, followed by a cooling period up to the 1960s. The current warming period commenced around 1980.

2006 was the warmest year recorded in Ireland since the record-breaking year of 1995 at both Malin Head and Phoenix Park, which have observations dating back over 100 years, and also at Casement Aerodrome, Kilkenny and Rosslare.

2016 has been recorded as the warmest year since 2006, and the last 10 years have been the warmest decade. Whilst we can be less categorical about wind speeds, there is some evidence of a reduction in annual average wind speeds, with a corresponding decrease in the frequency of high wind speeds and gusts. Increases in total annual rainfall in parts of the west and north have been observed, with some increase in the number of days with heavier rain but there is no clear pattern of change in other areas.

While the national scale of potential change is evident, translating the potential effects of climate change to a region is a process of inference on what will happen to Ireland at large being reduced to a regional scale. Temperatures in Ireland are predicted to increase by 1.25-1.5°C by 2040 compared to 1961 to 2000.

Rainfall is expected to increase in winter by about 15% and summer projections range from no change to a 20% decrease, potentially along the east coast of the country.

Studies have shown that extreme rainfall events associated with climate change show more marked changes with more events occurring in autumn and a 20% increase in 2-day extreme rain amounts, especially in northern areas.

Taking the projected precipitation changes into account, there will be the potential for a significant increase in the number of extreme discharge events and a slight increase in their intensity, leading to an increased probability of flooding in the future.

The potential rise in global temperature might affect the intensity and frequency of storms in the North Atlantic. As a consequence of stormy weather there exists the potential for flash flooding and erosion which would affect a wide range of ecosystems and economic sectors.

Climate Change Targets

In December 2008, the EU Climate Change and Renewable Energy Package set out a number of commitments. This package commits to reduce the EU's Greenhouse Gas (GHG) emissions from non-Emission Trading Scheme (ETS) sectors (such as transport, agriculture, residential and waste) by 20% on 2005 levels by 2020 or by a more ambitious 30% in the event of a comprehensive global agreement.

As part of the effort-sharing proposal of this package, Ireland is one of the countries facing the highest target of a 20% reduction on 2005 levels for non-ETS sectors. This will result in a limit of approximately 38 Mt CO₂ equivalent for Ireland's non-ETS emissions in 2020, together with annual binding limits for each year from 2013 to 2020.

In October 2014, EU leaders agreed a 2030 policy framework to reduce greenhouse gas emissions by at least 40% compared to a 1990 baseline.

Regulation 2018/842 of the European Parliament and of the Council requires Ireland to meet a reduction of 30% in greenhouse gas emissions relative to 2005 levels.

The Climate Action and Low Carbon Development Act was published by government in January 2015. The Act sets out the national objective of transitioning to a low carbon, climate resilient and environmentally sustainable economy in the period up to 2050.

The EPA produces greenhouse gas emission projections on an annual basis for all sectors of the economy. According to the latest set of projections (June 2019), based on two different scenarios, Ireland's emissions in 2020 could be in the range of 5-6% below 2005 levels. The projection figures indicate Ireland is likely to exceed its annual targets up to 2020.

The publication Ireland's Environment 2016 – An Assessment (EPA, 2016) provides a high-level summary on the status of greenhouse gases and climate change in an Irish context. It describes the key drivers and pressures and responses to climate change that may occur, providing an outlook of greenhouse gas projections to 2020, and also identifies future challenges to be addressed.

5.8 Archaeology, Architectural and Cultural Heritage

Built heritage is addressed in this report under the following headings:

- Archaeological Heritage;
- Architectural Heritage; and
- Vernacular Heritage.

Kildare County Council published the County Kildare Heritage Plan 2005-2011 in 2005. The Heritage Plan outlined an action plan for the conservation, preservation and enhancement of Kildare's heritage including natural heritage.

The County Kildare Heritage Plan 2019-2025 was adopted by KCC in May 2019 after having been subject to a period of public consultation during the preparation of this SEA Environmental Report.

The built heritage of Kildare refers to all man-made features, buildings or structures in the environment. This includes a rich and varied archaeological and architectural heritage to be found throughout the countryside and within the historic towns and villages of the county.

The architectural and archaeological heritage of a town, village or place contributes greatly to the distinctive character of each local area.

5.8.1 Archaeological Heritage

A record of archaeological heritage is maintained on the ‘Record of Monuments and Places’ which was established under Section 12 of the National Monuments (Amendment) Act, 1994 (No. 17 of 1994). Structures, features, objects or sites listed in this Record are known as Recorded Monuments.

The Record of Monuments and Places (RMP) comprises a list of recorded monuments and places and accompanying maps on which such monuments and places are shown for each county.

The National Monuments Service of the Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs will advise on the protection applying to any particular monument or place under the National Monuments Acts by reason of it being entered in the Record of Monuments and Places and should be consulted if there is any doubt as to the status of the site.

For national monuments in the ownership or guardianship of the Minister or a Local Authority or which are subject to a preservation order or temporary preservation order, the prior written consent of the Minister is required for any works at or in proximity to the monument.

According to the database there are approximately 84 Recorded Monuments and Places within County Kildare as outlined in the following tables. **Figure 4.12** depicts Recorded Monuments in County Kildare.

Table 4.13: National Monuments in State Ownership in County Kildare

RMP Number	Monument	Townland
KD002-007	Grange Castle	Grange Castle
KD019-033001	Manorial House	Jigginstown
KD020-007006 KD020-007005	Castle, Church, Cross	Kilteel Upper
KD005-015	Castle	Maynooth
KD038-035	Ringfort	Mullaghreelan
KD028-049005, KD028-04906, KD028-049002 KD028049003, KD028-049004, KD028-049010	High Crosses, Round Tower	Oughterard
KD015-007003, KD015-007005	Round Tower, Church	Oughterard
KD024-009001	Standing Stone	Punchestown
KD010-014002	Church & Graveyard (Monastic Site)	Taghadoe
KD010-014004	Round Tower	Taghadoe
KD011-040	Conolly Folly- Folly/Obelisk	Barrogstown West
KD040-002005	Castledermot Abbey	Friary (Franciscan)
KD010-018001	Castle	Rathcoffey Demesne

Table 4.14: National Monuments in State Guardianship

RMP Number	Monument	Townland
KD040-002002 KD040-002004 KD040-002010 KD040-002011 KD040-002012	Round Tower, Crosses	Castledermot
KD019024001	Furness Church	Forenaghts Great
KD038-045001	St. John's Tower	Skenagun

Table 4.15: Monuments Vested in the Care of Kildare County Council

RMP Number	Monument	Townland
KD002-009	Carrick Castle	Carrick
KD007-001	Kinnafad Castle	Kinnafad
	Remains of Mortuary Chapel at Carbury	Carbury
KD011-015001	St Patrick's Chapel, Ardrass	Ardrass
	Arch of Haynestown Castle	Haynestown
KD023-015	Great Connell standing stone	Great Connell
KD036-031	Moone High Cross and graveyard	Moone
	Eagle Monument at Belan, Moone	Moone

Table 4.16: National Monuments which are subject to Preservation Order in County Kildare

P.O. Order Number	RMP Number	Monument	Townland
78/1939	KD013-019002 KD013-019003	House or Castle	Jigginstown
88/1940	KD014-026004	Tumulus or Moat	Carrigeen
91/1940	KD035-010001	Moat	Ardsnull
92/1940	KD029-023	"Broadleas Circle (Pipers Stones)	Broadleas Commons
93/1940	KD029-014001	Standing Stone Longstone	Broadleas Commons
94/1940	KD024-007	Standing Stone	Craddockstown West
95/1940	KD019-022002 KD019-022001	Ringfort & Standing Stone	Forenaghts Great

P.O. Order Number	RMP Number	Monument	Townland
183/1948	KD038-045001	St. Johns Tower (see Nat Mon no 503)	Skenagun
200/1995	KD028-038001 KD028-038002 KD028-038003 KD028-038004	Dun Ailline	Knockaulin & Glebe North
14/1956	KD014-021	Rectilinear Earthwork-Pudderhall Moat	Clownings
15/1956	KD029-049	Ring-barrow	Grangebeg
16/1956	KD022-014	Ring-barrow	Lackagh Beg
17/1956	KD020-009004	Motte	Rathmore East
16/1970	KD017-011001	Ringfort	Rathangan
9/1970	KD024-001001	Rath	Rathaskar
10/1972	KD024-025	“The Ring” Earthwork	Sillagh
11/1972	KD012-006	Monastic	Lullymore East
1/1993 TPO	KD009-005	Ringfort	Donadea
7/1973	KD032-012001	Standing Stone	Kilgowan
8/1976	KD032-024 KD032-023	Two Ringforts	Brewel West
32/1976	KD032-026001 KD032-026002	Stone Circle	Brewel West
1/1977	KD004-029	Moated House Site	Ballykeelan
1/1999	KD029-0110	Medieval Settlement	Ballymore Eustace
3/2000	KD019-032 KD019-034 KD019-033001 KD019-033002 KD019-033003	Remains of sunken garden, pavilion & defensive earthworks	Jigginstown
03/07	KD019-010 KD019-056 KD019-057 KD019-008004	Archaeological Complex	Kill Hill

Table 4.17: Register of Historic Monuments in Kildare

RMP Number	Name	Townland
KD010-001001	Portion of the of the Pale (Linear Earthwork)	Ballybrack, Ballyloughan, Clonduff, Graiguepottle, Clonfert South
KD010-021	Portion of Pale	Castlebrown or Clongowes

RMP Number	Name	Townland
KD014-008002		
KD010-001001	Earthwork	Mullamast
KD008-001001 KD008-001002	Carbury Castle	Carbury
KD032-012001	Standing Stone	Kilgowan
KD024-026	Motte & Bailey	Donode Big
KD024-012	Ringfort	Blackhall
KD028-024	Multiple Ring Barrow	Killcullenbridge
KD019-001	Four groups of Barrows	Barrettstown
KD019-032 KD019-034 KD019-033001 to KD019 033003	Remains of Sunken Garden, Pavilion & Defensive Earthwork	Jigginstown
KD019-035	Ringfort	Ladytown
KD036-034	Ringfort	Moone
KD040-015	Old Priory or Nunnery of Graney	Graney East
KD029-031	Ringfort	Alliganstown
KD009-011001	Early Church Site	Dunmurraghill
KD020-005	Inauguration Mound	Kilteel Lower
KD014-007001	Motte & Bailey	Mainham
KD006-005	Earthworks Associated with Early Church Site	Donaghmore
KD019-030	Motte	Naas West
KD036-023	Ring Barrow	Timolin
KD017-031	Fulacht Fiadh	Mount Prospect
KD029-027	Ringfort	Kennycourt
KD023-012	Motte & Bailey	Oldconnell
KD019-046, KD019-048 KD019-049, KD019-050 KD019-054, KD019-055	Fulacht Fiadh Complex/Area	Tipper South
KD010-018	Castle	Rathcoffey Demense
KD020-010	Ringbarrow	Punchestown Great
KDD020-006, KD020- 007002 to KD020-007010 KD020-008001	Medieval Settlement	Kilteel

RMP Number	Name	Townland
KD004-026002 KD004-026003	Church Enclosure & Graveyard	Grange
KD027-004	Tumulus	Grangebeg/Ballygreany
KD004-005	Church & Graveyard	Dunfierth
KD011-011	Medieval Bridge	Parsonstown, Coneyburrow & St. Wolstan's
	Three Enclosures	Ballymore Eustace West
	Medieval settlement	Ballymore Eustace East
KD022-029, KD022-030	Greyfriars Abbey	Kildare/Grey Abbey
KD024-003 KD024-003001 KD024-003002 KD024-003003	Ecclesiastical Remains, Church & Graveyard, Round Tower, Souterrain(s)	Killashee

Ireland has a long and varied maritime history with extensive records for wrecks along its coast, rivers, lakes and offshore waters. The Underwater Archaeology Unit (UAU) of the Department of Arts, Heritage, Regional, Rural and Gaeltacht affairs is in the process of compiling an inventory of wrecks for the coastal and inland waters of Ireland, the records from which are stored in a shipwreck inventory database and housed in the UAU archive. The Wreck Database is accessible through the Archive Unit of the National Monuments Service.

Over 18,000 wrecks have been recorded to date ranging from small fishing boats, dugout canoes and coastal traders to steamships and ocean-going ships. Though earlier sources have been included where obtainable, the Inventory is largely based on documentary sources available from after 1700AD. As such, previously unrecorded shipwreck sites, including those dating to earlier periods, may await discovery in the River Liffey and its tributaries. Other forms of underwater archaeology may survive in the River Liffey in the form of abandoned vernacular craft, harbours, piers and jetties, waterside features, mills, fortifications, anchors, fish traps, crannogs, bridges, weirs, artefacts and the material traces of any activities in the past that involved the exploitation of riverine resources.

Many of these site types are protected and can be identified from the Record of Monuments and Places for the relevant County and in the relevant Urban Archaeology Survey. However, previously unrecorded archaeological sites other than wrecks may also lie undiscovered in the rivers and streams in County Kildare.

5.8.2 Architectural Heritage

As defined by the Heritage Act, 1995, 'architectural heritage' includes all structures, buildings, traditional and designed, and groups of buildings including streetscapes and urban vistas, which are of historical, archaeological, artistic, engineering, scientific, social or technical interest.

The National Inventory of Architectural Heritage (NIAH) is a state initiative under the administration of the Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs and established on a statutory basis under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999.

The purpose of the NIAH is to identify, record, and evaluate the post-1700 architectural heritage of Ireland, uniformly and consistently as an aid in the protection and conservation of the built heritage. NIAH surveys provide the basis for the recommendations of the Minister for Arts, Heritage, Regional, Rural and Gaeltacht Affairs to the planning authorities for the inclusion of particular structures in their Record of Protected Structures (RPS).

County Kildare has an abundance of structures of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. Such features are contained in the Record of Protected Structures (RPS), Appendix 3 of the County Development Plan 2017-2023.

In assessing proposals for development affecting a protected structure, the Council will require planning permission for works, both to the exterior and interior, which materially affects the character of a protected structure.

Owners and occupiers of protected buildings are required to ensure that buildings do not become endangered through harm, decay or damage.

There are 11 Architectural Conservation Area boundaries (ACA) in County Kildare, as shown in **Figure 4.14**. In Architectural Conservation Areas, the Council will have regard to the enhancement and protection of the essential visual qualities of the area when developing in an ACA.

5.8.3 Vernacular Heritage

Vernacular Architecture describes the local regional traditional building forms and types using indigenous materials, and without grand architectural pretensions, i.e. the homes and workplaces of the ordinary people built by local people using local materials. This is in contrast to formal architecture, such as the grand estate houses of the gentry, churches and public buildings, which were often designed by architects or engineers.

The majority of vernacular buildings are domestic dwellings. Examples of other structures that may fall into this category include shops, outbuildings, mills, limekilns, farmsteads, forges, gates and gate piers.

5.9 Landscape and Visual

5.9.1 Landscape

Landscape embraces all that is visible when one looks across an area of land. As well as being an important part of people's lives, giving individuals a sense of identity and belonging, landscape is the context in which all changes take place.

County Kildare is located in the Mid-East Region in Ireland. It is completely inland and bordering Dublin. The River Barrow, the River Boyne and River Liffey provide important landscape features in the area.

A Landscape Character Assessment (LCA) of the county was prepared as part of the Kildare County Development Plan.

The LCA focused on characterisation i.e. the discernment of the character of the landscape based on its land cover and landform, but also on its values, such as historical, cultural, religious and other understandings of the landscape. The purpose of this document is to assist in the development of the landscape objectives for the County Development Plan.

The County is divided into 15 geographically specific Landscape Character Areas (LCAs). In order to inform the Landscape Character Assessment, a landscape sensitivity map was prepared. Landscape sensitivity is a measure of the ability of the landscape to accommodate change or intervention without suffering unacceptable effects to its character and values.

The sensitivity of the Northern Lowlands is deemed to be of ‘Low-Sensitivity’ and is defined as an area *‘with the capacity to generally accommodate a wide range of uses without significant adverse effects on the appearance or character of the area.’*

The CORINE Land Cover (CLC) inventory is a Pan-European land use and landcover mapping programme.

It supplies spatial data on the state of the European environmental landscape and how it is changing over time. CORINE Land Cover mapping classifies land cover under various headings. The main land-uses in the County is Agricultural Areas, Artificial Surfaces, Peat Bogs, Inland Marshes and Forest (Mixed and Broad-Leaved),

Refer to **Figure 4.15** for CORINE Landcover Data in the County and **Figure 4.17** Landscape Character Areas.

5.9.2 Visual

Scenic routes and protected views consist of important and valued views and prospects within the county. The Kildare County Development Plan outlines all the views and prospects in the County which have been identified as being worthy of protection.

Views as prospects in County Kildare are illustrated on **Figure 4.16** and described in **Tables 4.18-4.22**.

Table 4.18: Views of the River Liffey from Bridges

View Reference	Bridge Townland/Location
RL 1	Leixlip Bridge, Leixlip
RL 2	New Bridge, Coneyburrow
RL 3	Celbridge Bridge, Celbridge

View Reference	Bridge Townland/Location
RL 4	Straffan Bridge, Lodgepark Straffan
RL 5	Alexandra Bridge, Abbeyland
RL 6	Millicent Bridge, Castlesize
RL 7	Carragh Bridge, Halverstown/Gingerstown
RL 8	Victoria Bridge, Moortown/Yeomanstown
RL 9	New Bridge, Droichead Nua (Newbridge)
RL 10	Athgarvan Bridge, Rosetown/Athgarvan
RL 11	Kilcullen Bridge, Kilcullen
RL 12	New Bridge, Cramersvalley/Camalway
RL 13	Ballymore Bridge, Ballymore Eustace

Table 4.19: Views of the Rye Water from Bridges

View Reference	Bridge Townland / Location
RW1	Black Bridge, Kellystown/Blakestown
RW2	Carton Bridge, Carton Demesne
RW3	Sandfords Bridge, Carton Demesne
RW4	Kildare Bridge, Carton Demesne

Table 4.20: Views of the River Barrow from bridges, adjacent lands and roads

View Reference	Bridge Townland/Location
RB 1	Greese Bridge, Jerusalem Newtownpilsworth
RB 2	Maganey Bridge, Maganey Lower
RB 3	Tankardstown Bridge, Grangemellon
RB 4	Bert Bridge, Tyrellstown
RB 5	Dunrally Bridge, Lowtown
RB 6	Pass Bridge, Passlands
RB 7	Mill Bridge
RB 8	Ballylough Bridge

Table 4.21: Views to and from bridges on the Grand Canal

View Reference	Bridge Townland/Location
GC 1	Old Grange Bridge, Old Grange
GC2	Henry Ridge, Clonaghtris
GC 3	Ponsonby Bridge, Barrowrath
GC 4	Devonshire Bridge, Sherlockstown Common
GC 5	Digby Bridge, Aghpaudeen
GC 6	Landenstown Bridge, Landenstown
GC 7	Connaught Bridge, Newtown

View Reference	Bridge Townland/Location
GC 8	Cock Bridge, Goatstown
GC 9	Bonyng Bridge, Mouds
GC 10	Binn's Bridge, Robertstown
GC 11	Fenton Bridge, Lowtown
GC 12	Bond Bridge, Derrymullen
GC 13	Hamilton's Bridge, Killinagh Lower
GC 14	Ticknevin Bridge, Ticknevin
GC 15	Harberton Bridge, Littletown
GC 16	New Bridge, Littletown
GC 17	Skew Bridge, Ballyteige North
GC 18	Huband Bridge, Grangeclare West
GC 19	Pim Bridge, Newpark
GC 20	Pluckerstown Bridge, Pluckerstown
GC 21	Milltown Bridge, Milltown
GC 22	Ballyteige Bridge, Ballyteige
GC 23	Glenaree Bridge Glenaree
GC 24	Rathangan Bridge, Rathangan
GC 25	Wilson's Bridge, Kiltaghan North
GC 26	Ummeras Bridge, Ummeras More
GC 27	Aylmer Bridge, Kearneystown Upper
GC 28	High Bridge, Old Grange
GC 29	Milltown Bridge, Moatstown
GC 30	Tandy Bridge, Naas
GC 31	Abbey Bridge, Naas
GC 32	Ploopluck Bridge, Naas
GC 33	Limerick Bridge, Naas
GC 34	Milltown, Old Bridge
GC 35	Clogheen Bridge
GC 36	Bunberry Bridge

Table 4.22: Views to and from all bridges on the Royal Canal

View Reference	Bridge Townland / Location
RC 1	Bailey's Bridge, Maws
RC 2	Cope Bridge, Newtown/Leixlip
RC 3	Louisa Bridge, Easton/Leixlip
RC 4	Deey Bridge, Collinstown
RC 5	Pike Bridge, Railpark/Donaghmore
RC 6	Mullen Bridge, Railpark/Maynooth

View Reference	Bridge Townland / Location
RC 7	Bond Bridge, Maynooth
RC 8	Jackson's Bridge, Laraghbryan East
RC 9	Chambers Bridge, Maws
RC 10	Shaw Bridge, Kilcock
RC 11	Allen Bridge, Boycetown

There are 40 scenic routes located within the County which are illustrated on **Figure 4.16** and described in **Table 4.23**.

Table 4.23: Scenic Routes in County Kildare

No.	Description	Location
1	Views of Old Kilcullen, from N78 Motorway Interchange to South of Moortown House	Knockbounce, Old Kilcullen, Hacklow, Halverstown
2	Views to the East of Yellowbogcommon, from N9 Motorway Interchange to Halverstown Cross Roads	Yellowbogcommon, Glebe South
3	Views of Curragh Plains, from the M7 Interchange to St. Ledgers Bottoms	St. Ledgers Bottoms, Curragh
4	Views of Curragh Plains including Little Curragh; County Road from Kildare Town Boundary to Military Ranges, R413 from Kildare Town Boundary to Motorway Interchange	Curraghfarm, Strawhall, Curragh, Little Curragh
5	Views of Moat and Ardscull, N78 from Russelstown Cross Roads to Kilmead	Tullygorey, Aghanure, Ardscull, Youngstown
6	Views of Robertstown Countryside and Views across the Canal	Mylerstown, Lowtown, Littletown, Derrymullen, Robertstown East
7	Views of Blessington Lake; N81 from Poulaphouca Bridge to County Boundary at Bishopslane and from County Boundary at Glashina to County Boundary at Glebe	Bishopslane, Crosscoolharbour, Pipershall, Hempstown, Common Glebe East, Glemore, Barrettstown
8	Views of Bogland Plains; L3002 from Kilmoney Cross Roads to Feighcullen Cross Roads at Boston Hill	Bostoncommon, Drinnastown, Kilmoney North
9	Views of River Liffey; R411 Liffey Bridge at Ballymore Eustace to Cross Roads Boundary at Silverhill Upper Townland	Broadleas Commons, Bishopslane
10	Views of the West Plains on the Oughterard Road (L2009)	Bishopscourt Lower, Boston
11	Views of the Upland Areas on the Oughterard Road (L6018)	Pluckerstown, Oughterard, Castlewarden North
12	Views West of Kildare Plains from Redbog Area and Views towards Caureen; from Rathmore Cross Roads to Pipershall	Greenmount, Redbog, Pipershall, Rathmore West

No.	Description	Location
13	Views to the River Liffey on the R413 from Brannockstown Cross Roads to Ballymore Eustace.	Rochestown, Gaganstown, Ardenode East Cross Roads to Ballymore Eustace, Ballymore Eustace West
14	Views to and from Red Hill and Views of Central Kildare Plains and Boglands on the R401 and adjoining Roads	Redhill, Loughandys, Water Grange, Knocknagalliagh, Rathwalkin
15	Views to and from Dunmurray and Views of Central Kildare Plains and Boglands on the R401 and adjoining roads	Kilmoney South, Carrickanearla, Guidenstown, Dunmurray
16	Views of Chair of Kildare and Views of Central Kildare Plains and Boglands on the R415 and adjoining roads	Grange Common, Blakestown, Conlanstown, Canonstown, Carrickanearla
17	Views of Kildare Plains and Boglands from Hill of Allen	Dunbyrne, Barncrow, Baronstown West
18	Views from South/South-East Side of the Hill of Allen on the Milltown/Allen Road; R415 from Baronstown Barnacrow to Allen cross roads	Barnacrow
19	Views of Canal, River Slate and Surrounding Countryside from R414 at Rathangan	Bonaghmore, Kilmoney North, Mullantine, Mount Prospect, Newtown
20	Views of Plains of Kildare and West Central Boglands. Views to and from Newtown Hills (including county roads 5027, 1007)	Newtown, Grange, Kilbridge, Ovidstown, Killickaneeny, Nicholastown.
21	Views to and from Corballis Hills; County Roads from Carrigeen to Sherrifhill Cross Roads	Corballis, Tankardstown, Ballynacarrick Upper/ Lower, Sherrifhill, Alymerstown
22	Views to the North-West of the Open Countryside; from Kiltel Village to Rathmore Village	Furryhill, Kiltel Lower, Rathmore East
23	Views East at Brewel; L413 from Kingland Castle Ruins to Ballintaggart	Brewel East, Ballintaggart
24	Views across the Barrow Valley; L397 from Pinhill cross roads to Burton cross roads	Burton Big, Ballinadrum, Glassely
25	Views to the North-West of Kildare Plains; N78 South of Moortown House to Tippeen Lower.	Moortown, Thomastown, Ballyshannon, Tippeen Lower
26	Views to and from Hughestown Hill (L8052)	Hughestown, Carrigeen Hill, Ballynacarrick Lower, Davidstown
27	Views to the south of open countryside; from L138 Kilmeague cross roads to Coolaght	Kilmeague, Coolaght
28	Views from county roads (L5017 & L26) of Carbury Castle and Hill: Teelough road junction with the R402 and upland area at Mylerstown	Calfstown, Mylerstown, Knockcor, Carbury, Coolcor
29	Views of countryside and East Kildare Uplands from Bishopshill Commons	Carrigeen, Barrettstown

No.	Description	Location
30	Within Carton Demesne Walls: Views to and from Carton House, the Lake and Woodland Areas	Carton
31	Views within Castletown - Donaghcumper Rural Area; Views to the South and North from Castletown House, including axial views to the Obelisk and the Wonderful Barn.	Castletown, Barrogstown, Barnhall, Rinawade, Crodaun
32	Views of the River Liffey from the main avenue of Castletown House	Castletown
33	Views to and from the Ridgeline on the East Kildare Uplands and Views of the Central Plains	Cromwellstownhill, Cupidstown Hill, Rathbane, Punchestown, Caureen, Hempstown, Common, Pipershall, Crosscoolharbour
34	Views towards Lyons Hill, Liffey Valley, Clonaghilis and Oughterard; R403 from Barberstown Cross Roads to Saint Patrick's Hill	Barberstown Lower, Ardrass Upper, Castledillon Lower, Friarstown
35	Views of Dún Ailinne from the N78 – to Knockbounce	Moortowncastle, Moortown, Old Kilcullen, Glebe North, Knockaulin, Knockbounce
36	Views of the Gibbet Rath and the Curragh from the N7 at St. Ledgers Bottoms	St. Ledgers Bottoms
37	Views of Pollardstown Fen	
38	Views of Allenwood to Lullymore Local Road	
39	Views of Lullymore to Rathangan Local Road	
40	Views of Ballynafagh Lake	

5.10 Material Assets

The term ‘Material Assets’ refers to all infrastructure and local services including; transportation, water supply, wastewater treatment and discharge, waste management services, electricity supply, telecommunications etc. A summary of all material assets in County Kildare will be provided in the Environmental Report.

5.10.1 Water Supply

The provision of an adequate supply of water and wastewater treatment facilities is critical to facilitate and sustain the growth of the County over the lifetime of the Variation, and beyond. As of January 2014, Kildare County Council no longer has any direct control in relation to the provision of such services. The delivery, integration and implementation of water and wastewater projects and infrastructural improvements are now the responsibility of ‘Irish Water’.

Kildare County Council will work closely with Irish Water to ensure that the Kildare County Development Plan and the revised Plan continue to align with both the National Planning Framework, National Development Plan and the Draft Regional Spatial and Economic Strategy for the Eastern and Midland Region, and that the provision of water/wastewater services will not be a limiting factor in terms of targeted growth.

Irish Water being the Water Services body for the state and County Kildare is responsible for providing and maintaining adequate public water supply infrastructure. Private water supplies provide an alternative for areas that are not served by public water supply infrastructure and comprise mainly of wells for single dwellings and group water schemes for rural clusters and small settlements. Farms and commercial developments outside of settlements will usually also have their own private supplies. While the Local Authority has a limited role in the provision of such private supplies, for domestic supplies it administers grant schemes where available and undertakes monitoring.

Compliance with the drinking water requirements is determined by comparing the results of analyses submitted by water suppliers to the standard for 48 parameters specified in the European Communities (Drinking Water) Regulations (No. 2), 2007. To ensure that these standards are met, each water supply must be monitored on a regular basis. Under Section 58 of the Environmental Protection Agency Act 1992, the EPA is required to collect and verify monitoring results for all water supplies in Ireland covered by the European Communities (Drinking Water) Regulations, 2000.

A Remedial Action List (RAL) of problematic drinking water supplies is released by the EPA on a quarterly basis.

The Remedial Action list is a public record for the supplies known to be at risk and where the EPA is requiring Irish Water to take corrective action. The EPA has instructed Irish Water to submit an action programme for the improvement of each of these supplies and has initiated enforcement action where action programmes were not being prepared or were not prepared to the satisfaction of the EPA. This includes issuing legally binding Directions requiring specific work to be carried out.

The most recent EPA Remedial Action List (Q4 of 2015) illustrates that all water supplies within the County were in compliance with the Drinking Water regulations for Q4 of 2015 and are not in need of improvement with respect to treatment and management issues.

5.10.2 Wastewater Treatment

The Water Services Acts 2007-2014 provide the legislative framework in relation to the planning, management and delivery of water supply and wastewater collection and treatment services. It incorporates a comprehensive review, update and consolidation of all existing water services legislation and facilitates the establishment of a comprehensive supervisory regime to ensure compliance with specified performance standards.

Kildare is served by circa 37 wastewater treatment plants. The largest wastewater treatment plants are located at Osberstown and Leixlip. Wastewater collection and treatment capacity has struggled to keep pace with development and many networks and plants in the county are operating at capacity. In 2017, both Osberstown and Leixlip plants were upgraded however a significant proportion of this capacity has been absorbed by a large industrial connection and headroom capacity for other developments is limited. It is planned to connect to the Ringsend catchment by 2020, which discharges treated effluent to Dublin Bay. The provision of treatment and network capacity is imperative to address water quality and sewage treatment issues to facilitate development.

There is currently a shortfall in design capacity at four of the public systems in the County: Derrinturn, Kilmeague, Leixlip and Oberstown. Two of the public waste water systems, Ballymore Eustace and Kilmeague, are identified by the EPA as having failed to comply with quality standards in 2014.

In the longer term, Irish Water will be looking at regional level solutions for the provision of wastewater infrastructure. The county is dependent on strategic national and regional solutions to the provision of water and wastewater infrastructure. The development of a new regional water supply source and the implementation of the recommendations of the Greater Dublin Strategic Drainage Study are central to the long term sustainable development of the county.

The Greater Dublin Strategic Drainage Study delivered an overview of the performance of the drainage infrastructure in the region's catchments and proposed infrastructural improvement works to facilitate the anticipated future growth in the catchment to 2031. Irish Water, with the support of Kildare County Council, now manages the major and minor capital works for combined (surface water) and wastewater networks.

Sustainable Urban Drainage Systems (SuDS) are advocated within the Greater Dublin Strategic Drainage Study with an objective to ensure that any future development does not increase flooding or pollution of rivers. The system aims to mimic the natural drainage of a site to minimise the effect of a development on flooding and pollution of waterways.

A Rural Water Strategic Plan is in place so that synergies with Irish Water's 25-year Water Services Strategic Plan and Irish Water's Capital Investment Plans can be met efficiently and effectively in rural County Kildare. 15% of the population of the county is served by group water schemes and private wells.

As outlined in Section 4.3.1, County Kildare is traversed by a number of ecologically sensitive watercourses.

Only clean, uncontaminated surface waters should leave the study area and drain to the river network. Treated effluent from wastewater treatment plants (WWTPs) discharging to any of the watercourses across the county should comply at all times to the requirements of the Urban Wastewater Treatment Directive and Water Framework Directive. Development in the study area must be in line with current available capacity in the relevant WWTP. This will be examined further in the undertaking of the SEA.

5.10.3 Transport Infrastructure and Facilities

The transportation system caters for the movement of communities and businesses. National and regional transport policy recognises that current transport trends in Ireland and the GDA, in particular levels of car use, are unsustainable and that a transition towards more sustainable modes of transport is required.

Kildare County Council recognises the progress made in the national public transport network over the past number of years, while acknowledging that deficiencies still exist within County Kildare. One of the major challenges facing the County during the lifetime of this Variation is the need to promote and provide for sustainable transportation options whilst providing for increased vehicular, cycle and pedestrian growth on the road network in the county through road improvement and management of demand where possible.

Kildare has a widespread transport network with many of the main transportation corridors linking Dublin to the rest of the country passing through County Kildare. The M4 runs east-west along the northern boundary of the county, the M7 runs diagonally on the northeast-southwest axis through the centre of the county and the M9 runs southwards to Castledermot, Carlow and onwards.

There are four mainline railway passenger services traversing the county, the Sligo, Cork/Limerick, Galway and Waterford lines and two suburban services linking Kildare to Heuston Station and Maynooth to Connolly Station.

Many residents of Kildare commute for employment. While 60% of those in employment have jobs within the county, over 40% travel outside of the county to their job. There is significant level of commuting into the north-eastern part of the county where there is a concentration of major employers. Dublin is the dominant employment destination with over 72% of outward Kildare commuters working in Dublin City Centre, South Dublin, Fingal, Dun Laoghaire Rathdown and Meath. Other commuting routes include connections to adjacent towns such as Carlow and Portlaoise in the south of the county.

Some 66% of commuters in County Kildare use private car transport. 18% of commuters use bus and/or rail for their daily commute. 16% of commuters walk or cycle to work, school or college. Walking and cycling trends vary across the county. This highlights the difference in the convenience of walking or cycling as an option, due to the level of connectivity, road safety and quality of facilities provided.

The improvement of public transport service and availability to the main centres of employment and retail primarily in Dublin is key to encouraging commuters to choose alternative modes of transport other than private cars.

As new employment opportunities develop in the County, particularly in the growth centres of Athy, Naas, Newbridge, Clane and Kilcock the challenge will also be to make these towns more accessible.

Smarter Travel – A Sustainable Transport Future – A New Transport Policy for Ireland (2009-2020) is the transport policy for Ireland within this period.

It recognises the vital importance of continued investment in transport to ensure an efficient economy and continued social development as well as promoting sustainable modes of transport. The National Cycle Policy Framework (as part of Smarter Travel – A Sustainable Transport Future) (2009) sets out a national policy for cycling, in order to create a stronger cycling culture, a friendlier environment for cycling and improved quality of life.

The Design Manual for Urban Roads and Streets, DTTS and DECLG (2013) (DMURS) provides mandatory guidance for all urban roads and streets within the 60 km/h urban speed limit. It addresses street design within urban areas and to put well-designed streets at the heart of sustainable communities.

As outlined in the Kildare CDP, the Council is committed to focussing on the need to underpin the planning process with an integrated approach to sustainable transport. The Council will endeavour to ensure that the accessibility of all areas will improve and will co-operate with the relevant statutory agencies and organisations in the achievement of national and regional policy. The Council are committed to the provision of sustainable transportation options throughout Kildare, whilst also providing for increased vehicular trips in the county through road improvement and management of demand where possible. The Council will be guided by the sustainable transport principles set out in the NTA Transport Strategy for the Greater Dublin Area 2016 - 2035.

5.10.4 Waste Management

Waste and recycling bin collection services have been privatised in County Kildare for the past 15 years. The following waste collectors currently provide these services:

- AES;
- Mahons Recycling;
- Oxigen;
- Ray Whelan; and
- Thorntons.

The Waste Facility Permit and the Certificate of Registration Database is a register for waste facility permits and certificates of registration issued by local authorities under the Waste Management (Facility Permit and Registration) Regulations, S.I. No. 821 of 2007, as amended.

According to the Local Authority Waste Facility Register, there are 25 licensed waste facilities within County Kildare. These are listed in **Table 4.24**.

Table 4.24: Licensed Waste Facilities in County Kildare

Name	Location	Authorisation Reference
Cleary Compost & Shredding Ltd	Larch Hill House Larch Hill Monasterevin Co. Kildare	WFP-KE-10-0064-01
All Spares (Kildare) Ltd	Ballysax The Curragh Co Kildare	WFP-KE-15-0079-01

Name	Location	Authorisation Reference
Aford Ltd	Hempstown Blessington Co Kildare	WFP-KE-15-0075-01
Nordvale Ltd	Laragh Kilcock Co Kildare	WFP-KE-15-0078-01
PheonixRM Limited	Unit W4D Toughers Business Park Naas Co Kildare	WFP-KE-15-0076-01
G&J O'Neill Enterprise Ltd	Unit 74A Naas Industrial Estate Naas Co Kildare	WFP-KE-15-0080-01
Callan Sand & Gravel Limited	Drinnanstown North Rathangan Co. Kildare	WFP-KE-16-0083-01
Kilsaran Concrete	Halverstown Kilcullen Co Kildare	WFP-KE-16-0085-01
Copart Vehicle Auctions Ireland Limited	Big Bog Castledermot Kildare	WFP-KE-16-0082-01
Osberstown Developments Ltd	Millennium Park Naas Co Kildare	COR-KE-16-26-01
RPM Greentech Ireland Ltd	Block W2 Unit A1 Ladytown Business Park Naas	WFP-KE-17-0086-01
Martin Coyne & Adele Clinton	Allenwood North Naas Co Kildare	COR-KE-17-0027-01
Wilton Scrap Metals Ltd	Osberstown Industrial Park Caragh Road Naas Co Kildare	WFP-KE-18-0091-01(T)
Merlon Contractors Ltd	Ryebridge Kilcock Co Kildare	COR-KE-18-0030-01
Bolton Biofuels Ltd	Bellevue Grangeford Castledermot Co Kildare	WFP-KE-18-0093-01
Robert Wilson-Wright	Coolcarrigan Timahoe Co Kildare	COR-KE-18-0031-01
Ballymore Naas Developments Limited	Pipers Hill Kilcullen Road Naas Co Kildare	COR-KE-19-0032-01
Arkill Limited	Boston Hill Quarry Drinnanstown South Rathangan Co Kildare	WFP-KE-18-0087-01
Liam Kelly	Kilbrook Enfield Co Kildare	WFP-KE-18-0092-01
Oliver Richardson	Cappagh Enfield Co Kildare	WFP-KE-18-0090-01
Corcoran Auto Body Works Ltd	Unit 2 Pine Road Tougher Business Park Naas Co Kildare	WFP-KE-18-0088-01
Caglin Ltd	Unit 1 Gateway Business Park Dublin Road Gallows Hill, Athy Co Kildare	WFP-KE-15-0081-01
Irish Lamp Recycling Ltd	Woodstock Industrial Estate Athy Co Kildare	WFP-KE-19-0094-01
Garden Waste Recycling Ltd	Kealstown Maynooth Co Kildare W23 FT91	WFP-KE-19-0095-01
Tommy & Dawn Lynch	Maddenstown South Kildoon Co Kildare R51 YV06	COR-KE-19-0033-01

6 Alternatives Considered

6.1 Introduction

This section identifies and describes different alternative development scenarios considered during the development of the Variation, taking into account higher level strategic actions as well as the geographical scope of the County. The scenarios are evaluated in Section 5.3 resulting in the identification of potential effects and informing the selection of a preferred alternative for the Variation.

One of the critical roles of the SEA is to facilitate an evaluation of the likely environmental consequences of a range of alternative scenarios for accommodating future growth in County Kildare.

Ireland appears to be entering a period of economic recovery that is likely to be sustainable for the foreseeable future. Growth in the regional and national economies will be uneven at first – starting in the environs of the major settlements – before moving to more rural areas later. Kildare’s key location straddling major transportation and infrastructure routes together with its proximity to the Dublin/M50 Metropolitan region will mean that this recovery and growth will be early and amplified in this County.

As Leinster continues to increase in population and prosperity, Kildare is likely to remain one of the fastest growing counties. The demographic growth is likely to support and attract additional enterprise and employment – especially in services sectors and the new services and social media industries that rely on proximity to large pools of educated labour.

Changes in EU agricultural policies are likely to lead to intensification of pockets of high value dairy and tillage in parts of the County. The areas of highest agricultural productivity are in the same general locations as those that are likely to experience growth in settlement and enterprise.

Settlement is likely to concentrate along the major transportation corridors. Motorway and rail connections will drive expansion of demand for affordable housing and good residential amenities. This will concentrate in areas that lie within a 40 to 60-minute commute from the M50 regional concentration of economic activity.

Growing concentrations of population coupled with good transportation access to regional employment opportunities and international transport connections are likely to increasingly attract new enterprise activity. All of Kildare lies within 100km – one hour of Dublin airport – this travel time is a very important locational factor for Foreign Direct Investment. As the price of labour, services and accommodation increases within the M50 there is likely to be a steep increase in enterprises seeking to be located in the better endowed towns and villages within the key Strategic Communication Corridors.

These smaller settlements that can offer high quality of life with affordable accommodation are likely to experience above average demand for growth – and may provide opportunities for significant rejuvenation of older urban cores.

Post Common Agricultural Policy (CAP) - reform intensification of agriculture will result in increased size of holdings (by renting or acquisition) and well as increased environmental pressures due to disposal of wastes arising. The growth is likely to concentrate in and around zones of existing specialisation. Specialist agriculture may increasingly conflict with nonconforming adjacent infrastructure, enterprise and settlement projects - in areas of specialist concentration.

Growth in settlement and enterprise will drive continuing need to install and upgrade infrastructure for energy, water services and transportation in rural areas. Extractive industries will continue to grow - especially close to major settlement and transportation corridors. Increasing prosperity, population and mobility throughout the region will place increasing pressure on regionally significant amenities. This will be most acute adjacent to strategic transportation corridors, such as canal and river corridors and the east Kildare Uplands as well as on small scaled attractions based on nature, culture or recreation.

The alternative development scenarios must be realistic, capable of implementation, and should represent a range of different approaches within statutory and operational requirements of the County Development Plan. In some cases, the preferred scenario will combine elements from the various alternatives considered.

As the current CDP has been reviewed and the Variation has been proposed, a ‘do nothing’ alternative is not considered, nor is it required to be by the SEA Directive.

The scenarios considered provide for alternative methods of meeting the requirements of the RSES, as described in Section 2.1. These range from a scenario that balances growth in larger towns whilst protecting small towns and rural areas from unsustainable growth to scenarios with an emphasis on growth within the large growth towns of Naas and Maynooth.

Some three alternative plan scenarios have been considered, as described in Section 5.2.

6.2 Alternative Plan Scenarios Considered

6.2.1 Alternative Plan Scenario 1

Scenario 1 centres on the concept of balanced growth in key towns and self-sustaining growth towns whilst protecting small / rural towns, villages and rural areas from unsustainable growth. Scenario 1 is made up of the following key principals:

- Allocate growth of 12% in each of the key towns Naas and Maynooth that have high quality transport links and capacity to act as regional drivers.

- Support growth in key towns allowing 8.5% growth in self-sustaining growth towns that contain a reasonable level of jobs, services and good transport links.
- Contain housing growth in self-sustaining towns allowing 5.5% growth and focusing on delivery of services, employment growth and infrastructure.
- Contain housing growth in small towns allowing for 3% growth again focusing on delivery of services, employment growth and infrastructure.
- Contain housing growth in rural towns and villages allowing for 1.5% growth and again focusing on delivery of services, employment growth and infrastructure.
- Manage growth in rural areas by allocating 4.5% growth across rural settlements, rural nodes and rural dwellers to protect the character of the countryside, assist in reaching climate change goals by reducing the need for car-based journeys / long-distance commuting and pressure to deliver services in isolated areas.

6.2.2 Alternative Plan Scenario 2

Scenario 2 centres on the concept of compact growth and the densification of Key Towns therefore prioritising urban areas. Scenario 2 is made up of the following key principals:

- This option places an emphasis on the Key Towns of Maynooth and Naas where each settlement would take 20% each of the total allocation until 2023.
- In this scenario the role of Maynooth in the Northwest corridor of the MASP (Metropolitan Area Strategic Plan as defined by the RSES) is exploited, which emphasises on the rail links to employment lands identified in Leixlip. Concentration is paid to developing the sustainable urban extension of Railpark as well as other key sites around the town.
- In Naas the focus of development will be placed on regeneration within the town centre as well as consolidation of the built form in other parts of the town. New development will be concentrated within the Northwest Quadrant where both residential and employment development will be centred around the proposed north-south public transport priority route which will link Millennium Park to the town centre.

6.2.3 Alternative Plan Scenario 3

Scenario 3 also centres on the concept of compact growth in urban areas particularly Maynooth and Naas. Allocated percentage growth as per the adopted CDP will be retained, with a proportionate reduction (in accordance with the RSES & NPF transitional population targets) respectively for each settlement in the County. Scenario 3 is made up of the following key principles:

- Encourage the focus of new development in consolidation within the existing urban footprint, by ensuring 30% of all new homes are targeted within the existing built-up areas to achieve compact growth of urban settlements.

- Supporting the achievement of more sustainable towns and villages through residential and employment opportunities with a focus on urban regeneration and compact growth together with supporting social and community facilities.
- Promoting economic development and employment opportunities within defined Strategic Employment Development Areas in the North-West corridor of the Metropolitan Area, in line with the overall Growth Strategy.
- While there is a focus on compact growth in urban areas there is a corresponding growth reduction in rural settlements. However, the Growth Strategy for the Region still supports rural areas with a network of towns and villages. The population growth of Villages should not grow beyond 25% of the Census 2016 population with a growth of 20% for Rural Settlements.
- The Growth Strategy also embeds a network of Key Towns, namely Naas and Maynooth, to deliver sustainable regional development.

6.3 Assessment of Alternatives

This section provides an assessment of each of the three alternative scenarios considered in the preparation of the Variation. This determination sought to understand whether each alternative was likely to improve, conflict with or have a neutral interaction with the receiving environment.

Each of the three alternative scenarios considered seek to meet the requirements of the NPF, as described in Section 2.1, by providing additional residential opportunities in County Kildare. As outlined in the requirements of the Variation, each of the alternative scenarios aim to meet the housing requirements in the RSES by concentrating on the concept of compact growth, and the consolidation and densification of the town centres and adjoining lands. This approach is common to each of the alternative scenarios, with some Variation in housing allocation.

The alternatives considered include scenarios that balance growth in larger towns whilst protecting small towns and rural areas from unsustainable growth and scenarios with a focus on growth within the large growth towns of Naas and Maynooth. The alternative scenarios are realistic and capable of implementation, representing different approaches to fulfil the requirements of the Variation.

By concentrating on the consolidation of the MASP as a means of fulfilling residential requirements, rather than exploring opportunities for rural development, the potential for urban sprawl and its associated negative environmental effects could become an issue. Urban sprawl is known to contribute to an increase in the reliance on private vehicle use, traffic congestion, air pollution, ambient noise, habitat fragmentation, and a decline in community cohesiveness. An increase in the population density of town centres and adjoining lands could result in a potential strain on the material assets which service the area. Provision of necessary supporting infrastructure is required in order to facilitate new development in growth areas and it should be ensured that sufficient network capacity is available with regards services and utilities.

This can be achieved through the implementation of phased development in growth areas, and by implementing the recommendations of the RSES Transitional Population Projections.

Infill development also provides an opportunity for the regeneration and revitalisation of Large Town centres, where vacant sites are targeted for redevelopment. This is likely to result in a positive effect on the landscape and visual setting of County Kildare. Urban regeneration of this nature does however have the potential to negatively affect features of archaeological and architectural heritage, particularly where development is proposed in the existing Architectural Conservation Area in the town.

Each of the alternative scenarios considered, seek to promote permeability and green linkages throughout County Kildare. This is likely to result in a positive effect on human health, air quality and climate, through improved pedestrian connectivity, and through the promotion of walking and cycling in urban areas. Over-utilisation of existing green areas does however have the potential to interfere with nature conservation objectives and natural heritage sensitivities. The provision of an expanded green buffers and open spaces will however enhance and off set potential negative impacts arising.

The provisions of the preferred Scenario 3 are evaluated using compatibility criteria (see Table 7.3 below) in order to determine how they would be likely to affect the status of the Strategic Environmental Objectives (SEOs). The SEOs and the alternatives are arrayed against each other to identify which interactions - if any - would cause effects on specific components of the environment.

6.3.1 Comparison of Scenarios

Alternative Scenario 1 centres on the concept of balanced growth across self-sustaining growth towns whilst protecting small, rural towns and villages from unsustainable growth. This scenario allocates 24% growth to Key Towns, with the remainder of growth allocation balanced across the County. The issue with this is that some areas do not have the capacity or infrastructure to withstand growth. This has the potential to have a negative impact on material assets, population and human health and potentially biodiversity and landscape and visual. Achieving balanced growth across all self-sustaining towns, small towns, villages is also unnecessary as areas closer to Dublin and the Dublin MASP are recognized as requiring higher growth due to proximity to the centre of employment and economic growth as opposed to other parts of the County. This scenario has the risk of negative environmental impact due to urban sprawl as opposed to compacted urban growth. For example, if Greenfield sites are used for residential development there are many negative environmental indicators which this can negatively effect, including biodiversity, land and soils, and landscape and visual.

Scenario 2 focuses 40% of the allocated growth on the Key Towns of Maynooth and Naas until 2023, much higher than Scenario 1. This scenario recognizes that the Key Towns require a concentrated focus due to their proximity and accessibility to Dublin as well as their existing infrastructure and potential for urban regeneration and development.

However, while although the development of the Key Towns and the North-West Quadrant requires a focus it is important to consider a growth plan for the rest of the County. Even though there is a growth reduction in smaller towns, there is still growth across all land zones, so all must be reasonably considered. There is therefore a potential negative effect on population and human health as well as material assets due to over development in certain areas resulting in an over utilisation of resources.

Scenario 3, the preferred scenario, encompasses the underlying concepts of both Scenarios 1 and 2 in that focus is given to growth in Key Towns, namely Maynooth and Naas, while limiting growth in rural areas. An emphasis is given to compact growth in urban areas as in Scenario 2 but still recognizes and plans for sustainable growth across smaller, rural developments as in Scenario 1.

Scenario 3 supports the continued growth of Dublin as the National Economic Engine, delivers sustainable compact urban areas through the regeneration of towns and villages through a plan-led approach and while still supporting rural communities through the identification of lower order centres including small towns and settlements to provide more sustainable development centres in rural areas.

This scenario, the preferred development strategy, has been informed by RSES and the environmental sensitivities of the County.

It would result in an overall neutral impact on population and human health due to a decrease in growth targets – with a negative impact on the population neutralized by a positive effect on human health. All other indicators have a potential positive or neutral impact. This is because the plan-led approach is balanced avoiding an over utilisation of resources ensuring material assets is not negatively impacted, while at the same time avoiding urban sprawl ensuring human health, landscape and visual are not negatively impacted. It would also reverse commuter patterns by promoting targeted investment for local employment and infrastructure in places that have experienced commuter driven population growth which would also contribute to a potential positive effect on material assets, air noise and climate and population and human health.

Measured growth with emphasis on economic growth in the towns identified as Self-Sustaining Growth Towns and Self-Sustaining Towns. A hierarchy of smaller rural settlements is established to develop rural centres capable of providing a range of services and employment to their local populations. It is proposed that settlements will develop as local centres for rural catchments with growth appropriate to cater for local demand. Lower densities will be encouraged in appropriate locations to provide alternatives to one-off rural dwellings in the immediate rural area. Expansion will be controlled to minimise pressure on services, the environment and unsustainable commuting patterns – mitigating any potential for negative environmental impacts.

7 SEA Objectives, Targets and Indicators

7.1 Introduction

The SEA is designed to assess the potential environmental effect of the policies of the Variation against the environmental baselines established.

The policies and associated recommendations are assessed against a range of established environmental objectives and targets. Indicators that are recommended in the SEA are utilised over the lifetime of the Variation to quantify the level of impact that the policies and recommendations have on the environment. This enables us to measure whether they were successful in promoting the sustainable development of the County.

7.2 Environmental Objectives

The formation of the environmental objectives required cognisance of the environmental protection objectives established at a range of levels through the legislation and guidelines outlined in Chapter 2. Global, EU and national level legislation, policy and associated environmental objectives were utilised to develop the environmental objectives for the Variation.

The objectives outlined below are also placed in the context of and linked into the development of the draft policies and recommendations to ensure that the objectives are appropriate for County Kildare.

The environmental objectives are also linked to appropriate targets and indicators outlined in the following sections. The environmental objectives are as follows:

Biodiversity

- Conserve the diversity of habitats and species by limiting adverse impacts on habitats and species of conservation concern, including the SACs / SPAs and to contribute to the protection of the ecological, visual, recreational, environmental and amenity value of the NHAs and pNHAs.

Population and Human Health

- Meet the future housing demand of County Kildare and provide all of the services required to sustainably meet this demand (e.g. health and sanitation services including waste collection, wastewater treatment and potable water supply, electricity, gas, telecommunications, transportation, education and amenity access).

Land and Soils

- Protect quality and quantity of existing soil and geology and maintain and preserve the Warm Spring sites of Geological Heritage.

Water

- Improve/maintain water quality and the management of the watercourses, reservoirs and lakes to comply with the standards of the Water Framework Directive and incorporate the objectives of the Floods Directive into sustainable planning and development.

Air, Noise & Climate

- Protection of ambient environmental of County Kildare through the implementation of European, national and regional policy and legislation relating to air quality, greenhouse gases, climate change, light pollution noise pollution and waste management.

Archaeological, Architectural and Cultural Heritage

- Promote the protection and conservation of the archaeological, architectural and cultural heritage of County Kildare, specifically those buildings identified on the Record of Protected Structures, and Recorded Monuments within the plan area, and promote the historic character and visual setting of the Kildare Architectural Conservation Areas.

Landscape and Visual

- Protect the landscape character, values, sensitivities, focal points and views in Kildare County, particularly the historic character and visual setting of the Architectural Conservation Areas.

Material Assets

- Make best use of existing infrastructure and phase the significant future growth of County Kildare in line with the capacity and delivery of the sustainable development of new physical infrastructure.

7.3 Environmental Targets

Each of the Environmental Objectives has a range of Environmental Targets which the CDP Policies and Recommendations are aimed towards. These targets need to be quantifiable to ensure that monitoring can be carried out effectively. The following targets have been established to direct the sustainable implementation of the Policies and Recommendations and to ensure that the environment is maintained and/or improved where possible.

Biodiversity

- Consider siting of new development on non-sensitive sites.
- Improve/conserves and protect all designated sites and species within County boundary.
- Deliver the requirement of the Habitats Directive (Article 4, Paragraph 4) for the maintenance or restoration of annexed habitats and species within SACs at a “favourable conservation status.

- Promote the maintenance and, as appropriate, achievement of favourable conservation status of habitats and species, in association with the NPWS and other stakeholders.
- Protect SPAs, Annex I bird species, and regularly occurring migratory bird species and their habitats, and avoid pollution or deterioration of important bird habitats outside SPAs.
- Improve the ecological coherence of Natura 2000 sites by encouraging the management of, maintaining, and where appropriate developing, features of the landscape which are of major importance for wild fauna and flora. Such features are those which, by virtue of their linear and continuous structure (such as rivers with their banks or the traditional systems for marking field boundaries) or their function as stepping stones (such as ponds or small woods), are essential for the migration, dispersal and genetic exchange of wild species.
- Protect NHAs, National Parks, Nature Reserves, Wildfowl Sanctuaries, Refuges for Fauna or Flora and sites proposed for designation.
- Improve/maintain protection for important wildlife sites, particularly urban wildlife corridors and linear and stepping-stone features for migration, dispersal and exchange of wildlife.
- Improve access for the appreciation and promotion of wildlife.

Population and Human Health

- Minimise population exposure to high levels of noise, vibration and air pollution.
- Increase modal shift to public transport.
- Co-ordinate land use and transportation policies.
- Improve access to recreation opportunities.

Land and Soils

- Prevent pollution of soil through adoption of appropriate environmental protection procedures during construction and maintenance works on site.
- Ensure polluting substances are appropriately stored and banded.
- Ensure appropriate management of existing contaminated soil in accordance with the requirements of current waste legislation.
- Re-use of brownfield lands, rather than developing Greenfield lands, where possible.
- Minimise the consumption of non-renewable sand, gravel and rock deposits.

Water

- Support the achievement of “good” ecological and chemical status/potential of waterbodies in accordance with the Water Framework Directive.

- Minimise flood risk through appropriate management of flood vulnerable zones.
- Promote sustainable drainage practices to improve water quality and flow.

Air, Noise & Climate

- Minimise air and noise emissions during construction and operation of new developments.
- Promote reduction of greenhouse gas emissions to the atmosphere.
- Limiting climate change and adapting to climate change.

Archaeological, Architectural and Cultural Heritage

- Regeneration of derelict and underutilised heritage sites.
- Improve appearance of areas with particular townscape character.
- Improve protection for protected archaeological sites and monuments and their settings, protected structures and conservation areas and areas of archaeological potential.
- Enhance access to sites of heritage interest.

Landscape & Visual

- Improve protection for landscapes of recognised quality.
- Maintain clear urban/rural distinctions.
- Enhance provision of, and access to, green space in urban areas.
- Ensure development is sensitive to its surroundings.

Material Assets

- Improve availability and accessibility of commercially provided facilities and public services.
- Increase local employment opportunities.
- Improve efficiencies of transport, energy and communication infrastructure.
- Promotion of sustainable transport infrastructure i.e. increased public transport.
- Reduce the generation of waste and adopt a sustainable approach to waste management.

7.4 Environmental Indicators

The assessment of Policies and Recommendations with respect to the Environmental Objectives and Targets is required to be measurable. The Environmental Indicators need to be capable of the following:

- Describing trends in the baseline environment.

- Demonstrating the likely significant effect of the implementation of the Variation.
- Being used in a monitoring programme.
- Providing an early warning of significant unforeseen adverse effects.
- Prioritising key environmental effects.
- Ensuring the number and range of environmental indicators are manageable in terms of time and resources.

Consequently, a range of Environmental Indicators required to assess the level of impact on the environment are outlined in **Table 6.1**.

Table 6.1: Environmental Indicators

Item	SEA Indicator
Biodiversity	Number and extent of Protected Sites. Areas actively managed for conservation. Population and range of Protected Species. Achievement of the Objectives of Biodiversity Plans.
Population & Health	Census population data. Rates of unemployment per area. Dependency ratio Deprivation Index Commuting times and modes of transport % increase in housing (number and type).
Soils & Geology	Rates of re-use/recycling of construction waste. Rates of cement/concrete production. Rates of brownfield site and contaminated land reuse and development. Rates of greenfield development.
Water Resources	Compliance of potable water sources with water quality regulations. Compliance of surface waters with national and international standards. Potable and wastewater treatment capacities versus population. % of wastewater receiving tertiary treatment. Achievement of the Objectives of the River Basin Management Plans. Amount of new developments within flood plains. Annual costs of damage related to flood events.
Air, Noise & Climate	Traffic, Transport and Vehicular survey data. National and region-specific emission data. Compliance with national standards. Reduction in greenhouse gas emissions. Number and extent of emission licensed facilities. Number of energy/renewable energy production facilities. Rates of energy/renewable energy consumption.
Heritage	Updating of inventories to include new sites/features. Achieving the objectives of development plans regarding heritage protection.

Item	SEA Indicator
	Range and extent of areas of heritage potential. Range and extent of areas of special planning controls.
Landscape & Visual	Range and extent of Amenity Landscapes. Rates of development within designated landscapes. Rates of urban expansion. Rates of deforestation. Rates of agricultural land re-development. % change of land use from rural to urban.
Material Assets	Location/level of Infrastructure. Achievement of development plan objectives. Rates of deprivation. Rate of waste disposal to landfill statistics. Range and extent of recycling facilities and services. Rates of recycling.

8 Assessment of Significant Effects

The approach used for assessing likely significant effects was objectives led. The assessment was primarily qualitative in nature, with some assessment based on expert judgement, as outlined in Section 5.3. This qualitative assessment compares the likely effects against the Strategic Environmental Objectives to see which Policies and Recommendations meet the Strategic Environmental Objectives and which, if any, contradict these.

Particular reference was made to the potential for cumulative effects in association with other relevant plans and programmes within the Kildare/Dublin Metropolitan Area.

Particular regard was also paid to the need for the sustainable development of ecological resources (including the conservation of fish and other species of fauna and flora, habitats and the biodiversity of water ecosystems and commercial and natural fisheries) as economic resources. In conjunction with the Habitats Directive Assessment due consideration was given to potential significant effects of the policies and recommendations on ecological resources for the following areas:

- Surface and ground water quality.
- Surface water hydrology.
- Fish spawning and nursery areas.
- Passage of migratory fish.
- Areas of natural heritage importance.
- Designated marine protected areas.
- Biological diversity.
- Ecosystem structure and functioning.
- Seabirds and marine mammals.
- Fish and shellfish cultivation.
- Sport and commercial fishing and angling.
- Amenity and recreational areas.
- Mineral and aggregate resources.
- Sediment transport and coastal erosion.
- Navigation.
- Other legitimate use of the sea.

8.1 Assessment of Environmental Effects

The environmental effects of the Variation objectives were assessed with respect to the existing environmental baseline as outlined in Chapter 4 and the environmental objectives listed in Chapter 6.

The assessment process categorised environmental effects using the ratings outlined in **Table 7.1** which is based on the impact assessment criteria defined by the EPA for environmental impact assessment.

Table 7.1: Significance Ratings

Significance of Effects	
	Neutral
	Positive
	Negative
	Uncertain

The matrix outlined in **Table 7.3** highlights these potential effects. It assesses all policies and objectives in the plan. This assessment outlines an unmitigated scenario. Where potential effects are identified, it is expected that these can be mitigated through the implementation of the mitigation measures outlined in Section 8.1.

Having regard to the objectives of the CDP, in particular the objectives outlined in **Table 7.2** below, it is assumed that the necessary provisions for the protection of biodiversity, land and soils, water, heritage and landscape will be undertaken prior to any development in Kildare County.

Note that a number of objectives have been removed (previous SO11, SO12 and SO13) as part of this Variation. There are no environmental impacts or consequences associated with the removal of these objectives as there is no change in outcome. These objectives have now been put into effect as part of carrying out this Variation and thus they are no longer required.

Table 7.2: Relevant Kildare County Development Plan Policies and Objections

Environmental Receptor	Relevant objectives
	County Development Plan Objectives
Biodiversity	NH1, NH2, NH3, NH4, NH5, NH6, NH7, NH8, NH9, NH10, NH11, NH12, NH13, NH14, NH15, NH16 NHO1, NHO2, NHO3, NHO4, NHO5, NHO6, NHO7, NHO8, NHO9, NHO10
Population and Human Health	LE1, LEO1, LEO2, LEO3, C1, C2, C3, EF1, EF2, EF3, EF4, EF5, EFO1, EFO2, EFO3, EFO4, EFO5, EFO6, EFO7 HS1, HS2, HS3, HS4, HS5, HSO1, HSO2, HSO3, HSO4, HSO5 MT1, MT2, MT3, MT4, MT6, MT7, MT8, MT9, MT11, MT12, MT15, MTO1, MTO3, MT04 PT1, PT2, PT3, PT4, PT5, PT6, PT7, PT8, PT9, PT10, PT11, PT12, PT13 PTO1, PTO2, PTO3, PTO4, PTO5, PTO6, PTO8 WC1, WC2, WC4, WC5, WC6, WC7, WC8, WC9, WC10, WC14 WCO1, WCO2, WCO3, WCO4, WCO5, WCO6, WCO7, WCO8, WCO9
Land and Soils	EO18, EO19, EO20, EO21, EO22, EO23 VM5, VM10 VM1, VM2, VM3, VM11, VM14, PC1
Water	WQ1, WQ2, WQ3, WQ4, WQ5, WQ6
Air, Noise and Climate	ER1, ER2, ER3, ER4, ER5, ER6, ER7, ER8, ERO1 WE1, WE2, WE3, WE4, WE5, WEO1 HD1, HD2, HD3, HD4 SE1, SE2, SE3, SE4 BE1, BE2, BE3 EW1, EW2 EB1, EB2, EB3, EBO1 GT1 MT1, MT2, MT3, MT4, MT6, MT7, MT8, MT9, MT11, MT12, MT15, MTO1, MTO3, MT04 PT1, PT2, PT3, PT4, PT5, PT6, PT7, PT8, PT9, PT10, PT11, PT12, PT13 PTO1, PTO2, PTO3, PTO4, PTO5, PTO6, PTO8 WC1, WC2, WC4, WC5, WC6, WC7, WC8, WC9, WC10, WC14 WCO1, WCO2, WCO3, WCO4, WCO5, WCO6, WCO7, WCO8, WCO9 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10
Archaeological, Architectural and Cultural Heritage	PS1, PS2, PS3, PS4, PS5, PS6, PS7, PS8, PS9, PS10, PS11, PS12, PS13, PS14, PS15, PS16, PS17, PS18, PS19, PS20, PS21 PSO1, PSO2, PSO3, PSO4, PSO5, PSO6, PSO7, PSO8 ACO1, ACO2, ACO3, ACO4 CH01, CH02 VS1, VA2, VA3, VA4, VA5, VA6, VA7, VA8 VAO1, VAO2 ACA1, ACA2, ACA3, ACA4, ACA5 ACAO1, ACAO2, ACAO3, AH1, AH2, AH3, AH4, AH5, AH6, AH7, AH8, AH9, AH10, AH11, AH12 AO1, AO2, AO3, AO4, AO5 HF1 HFO1, HFO1

Environmental Receptor	Relevant objectives
	County Development Plan Objectives
Landscape & Visual	LA1, LA2, LA3, LA4, LA5, LA6, LA7 LO1, LO2, LO3, LO4, LO5, LO6, LO7, LO8, LO9, LO10, LO11 LU1, LU2, LU3, LU4, LU5 TA1, TA2, TA3, TA4 WC1, WC2, WC3, WC4, WC5, WC6, WC7, WC8, WC9
Material Assets	WW1, WW2, WW3, WW4, WW5, WW6, WW7, WW8, WW9, WW10, WW11, WW12, WW13 MT1, MT2, MT3, MT4, MT6, MT7, MT8, MT9, MT11, MT12, MT15, PT1, PT2, PT3, PT4, PT5, PT6, PT7, PT8, PT9, PT10, PT11, PT12, PT13 PTO1, PTO2, PTO3, PTO4, PTO5, PTO6, PTO8 WC1, WC2, WC4, WC5, WC6, WC7, WC8, WC9, WC10, WC14 WCO1, WCO2, WCO3, WCO4, WCO5, WCO6, WCO7, WCO8, WCO9 WM1, WM2, WM3, WM4, WM5, WM6, WM7, WM9, WM10, WM11, VM15

8.1.1 Principal Environmental Effects

The matrix outlined in **Table 7.3** highlights these potential effects. It assesses the policies and objectives that have been changed as part of the Variation to the Kildare County Development Plan. This assessment outlines an unmitigated scenario. If potential negative effects are identified, it is expected that these can be mitigated (see Section 8.1).

Table 7.3: Assessment of Effects- Policies and Objectives of the Variation

Ref	Policy/Objective	SEA Environmental Objectives								Commentary
		Biodiversity	Population & Human Health	Land & Soils	Water	Air, Noise & Climate	Heritage	Landscape & Visual	Material Assets	
Core Strategy										
Policies: Settlement Strategy										
CS2	Direct appropriate levels of growth into the designated growth towns as designated in the Settlement Strategy.									<p>This Variation changes the direction for growth from growth centres and moderate sustainable growth towns to growth as designated in the Settlement Strategy. This ensures compliance with the NPF and the new spatial strategy as defined by the RSES as introduced in the Variation.</p> <p>This policy change is related to reduced level of growth compared to the original policy. This will have potential for an overall positive effect on the environment as there will be less pressure on resources. However, a potential neutral effect on population and human health is predicted due to a potential positive effect on human health from reduced development alongside a negative effect on population as the target is for overall reduced population growth.</p>
CS4	Deliver sustainable compact urban areas through the regeneration of towns and villages through a plan-led approach which requires delivery of at least 30% of all new homes that are targeted in these settlements to be within their existing built up footprint.									<p>This change expands the policy to specify the regeneration of towns and villages and includes the requirement of at least 30% of all new homes in these settlements to be within their existing built-up footprint – this emphasizes the revitalisation of existing urban areas, avoiding urban sprawl, in order to achieve sustainable growth, setting a measurable target.</p> <p>The regeneration and revitalisation of the urban centres in Kildare is likely to result in a positive effect on the landscape and visual setting of the County, where development is implemented at an appropriate scale and where development is responsive to its architectural surroundings.</p> <p>The expansion of the urban centres is likely to result in a positive effect on the population, as a result of increased residential, social and commercial opportunities and potential economic investment associated with the same.</p>

Ref	Policy/Objective	SEA Environmental Objectives								Commentary
		Biodiversity	Population & Human Health	Land & Soils	Water	Air, Noise & Climate	Heritage	Landscape & Visual	Material Assets	
										By concentrating on the concept of compact growth and consolidation of the Key Towns and MASP, rather than limiting opportunities for residential, social and commercial expansion to greenfield lands at the periphery of the Large Growth Towns, the potential for urban sprawl and its associated negative environmental effects is reduced, and development can be focused on existing made ground in the urban centres. An overall neutral environmental effect is therefore identified for all other SEOs for the purposes of this assessment.
CS 4(a)	Develop in accordance with the National Planning Framework (NPO 18b) a program for new homes in small towns and villages in association with public infrastructure agencies, local communities, housing bodies and landowners to identify lands for the provision of low density serviced sites with appropriate infrastructure throughout settlements identified as Rural Towns, Villages and Rural Settlements.									<p>This Variation includes additional policy with regards to single homes and new homes in small towns and villages in order to identify lands for the provision of low density serviced sites that have appropriate infrastructure throughout settlements identified as Rural Towns, Villages and Rural Settlements.</p> <p>This would have a potential positive effect on Material Assets as the identification of lands with appropriate infrastructure for site development will ensure that lands without appropriate material assets will not be developed – in this way over exploitation of resources will be avoided.</p> <p>An overall potential neutral environmental effect is identified for all other SEOs as there will be no significant consequences upon implementing this policy.</p>
Policies: Economic Development										
CS5	Support the development of the identified Key Towns of Naas and Maynooth and the Self-sustaining Growth Towns of Leixlip and Newbridge as focal points for									This Variation identifies Naas and Maynooth as ‘Key Towns’ whilst removing Leixlip and Newbridge from the list of larger growth towns. This focuses the large economic growth in Naas and Maynooth while smaller-scale sustainable economic growth is recognized for Leixlip and Newbridge. This is in keeping with the growth reduction as recommended by the NPF and RSES.

Ref	Policy/Objective	SEA Environmental Objectives								Commentary
		Biodiversity	Population & Human Health	Land & Soils	Water	Air, Noise & Climate	Heritage	Landscape & Visual	Material Assets	
	regional critical massing and employment growth.									The effect of removing Leixlip and Newbridge is related to reduced level of growth compared to the original policy. This will have potential for an overall positive effect on the environment as there will be less pressure on resources. However, a potential neutral effect on population and human health is predicted due to a potential positive effect on human health from reduced development alongside a negative effect on population as the target is for overall reduced population growth.
CS6	Encourage and facilitate new employment opportunities which improve the cluster-specific business environment.									This Variation changes the wording from the facilitation of new employment opportunities ‘within economic clusters and the hinterland towns’ to ‘which improves the cluster-specific business environment.’ This recognizes that new employment opportunities have a direct effect on economic clusters whereby increasing employment in an area will often lead to an increase in overall economic development in that area. A potential neutral effect on the environment is predicted as there is no significant change or implications from the previous policy.
CS7	Promote targeted ‘catch up’ investment to support self-sustaining local employment, and in services, sustainable transport and amenities in places that have experienced rapid commuter driven population growth.									The Variation expands on the policy to attract economic activity at appropriate locations to specify that targeted ‘catch-up’ investment should be promoted in order to support self-sustaining local employment, sustainable transport, services and amenities in places that have experienced rapid commuter driven population growth. This would have a potential positive effect on material assets as it would develop infrastructure in areas that require it, expanding and developing the resources available. A potential positive effect on population and human health could also be seen due to the development of services and transport, improving quality of life and accessibility. By increasing sustainable transport, it should reduce private vehicular usage which would potentially have a positive effect on air noise and climate. An overall potential neutral environmental effect is identified for all other SEOs as there will be no significant consequences for these objectives upon implementing this policy.

Ref	Policy/Objective	SEA Environmental Objectives								Commentary
		Biodiversity	Population & Human Health	Land & Soils	Water	Air, Noise & Climate	Heritage	Landscape & Visual	Material Assets	
CS8	Address commuting patterns by building up the local economy to a more sustainable level by promoting self-sustaining employment-based development opportunities in settlements to provide for employment growth for the existing population in order to reverse commuting patterns.									<p>This Variation expands on the policy to address commuting patterns by building up the economy to specify that self-sustaining employment-based development opportunities will be promoted to provide employment growth for the existing population in order to reverse commuting patterns.</p> <p>This policy change could potentially reduce commuter distances which would reduce private vehicular usage and travel times which could have a potential positive effect on air noise and climate and population and human health. There would also be a potential positive effect on material assets as there would be less pressure on existing infrastructure.</p> <p>An overall potential neutral environmental effect is identified for all other SEOs as there will be no significant consequences for these objectives upon implementing this policy change.</p>
Policies: National Climate Change Strategy										
CS16	It is the policy of the Council to: Support the implementation of the National Climate Change Strategy and the National Climate Change Adaption Framework Building Resilience to Climate Change 2012 through the County Development Plan through the implementation of the Climate Resilient Kildare: Climate Adaptation Strategy 2019-2024 in conjunction with all relevant stakeholders. Ensuring that climate action									<p>This Variation removes the need to undergo a Climate Change Adaptation Plan as this has now been carried out. Therefore, the 'Climate Resilient Kildare: Climate Change Adaptation Strategy 2019-2024' is included in this objective to support the National Climate Change Strategy. This Variation also introduces the integration of the climate action considerations into the land use planning and the efficient, sustainable use of land which was not included in the original objective. The effective use of land is necessary for the compliance with the new spatial strategy as defined by the NPF and the RSES.</p> <p>The original policy supports the implementation of the Climate Change Adaptation Strategy – this new policy still supports the implementation of the Climate Change Adaptation Strategy (now existing) therefore there is no implications arising from this Variation. A potential neutral effect on the environment is predicted as there is no significant change from the previous policy.</p>

Ref	Policy/Objective	SEA Environmental Objectives								Commentary
		Biodiversity	Population & Human Health	Land & Soils	Water	Air, Noise & Climate	Heritage	Landscape & Visual	Material Assets	
	considerations are integrated into land use planning and aid the transition to a climate resilient local carbon society, promoting and maximising the most efficient and sustainable use of land.									
Settlement Strategy										
Policies: Settlement Strategy										
SS2	Direct growth into the Key Towns, followed by the Self-Sustaining Growth Towns and the Self-Sustaining Towns, whilst also recognising the settlement requirements of rural communities.									<p>This is as opposed to growth in Large Growth Towns, followed by Moderate Sustainable Growth Towns and Small Towns - this Variation focuses growth in larger urban areas and minimises growth in smaller rural areas in keeping with the guidelines set out in the NPF and RSES.</p> <p>This policy change is related to reduced level of growth compared to the original policy. This will have potential for an overall positive effect on the environment as there will be less pressure on resources. However, a potential neutral effect on population and human health is predicted due to a potential positive effect on human health from reduced development alongside a negative effect on population as the target is for overall reduced population growth.</p>
SS5	Implement through appropriate policies the principles and guidance set out in:									<p>The addition of The National Planning Framework (2018), the Eastern & Midland Regional Spatial & Economic Strategy 2019-2031 (2019) and the Urban Development and Building Heights: Guidelines for Planning Authorities (2018) to the existing policies has been included for this Variation. The introduction of these policies changes the settlement and economic targets and projections providing new residential and growth opportunities in County Kildare.</p>

Ref	Policy/Objective	SEA Environmental Objectives								Commentary
		Biodiversity	Population & Human Health	Land & Soils	Water	Air, Noise & Climate	Heritage	Landscape & Visual	Material Assets	
	<p>(i)The National Planning Framework (2018) and the Eastern & Midland Regional Spatial & Economic Strategy 2019-2031 (2019). (ii) The Sustainable Residential Development in Urban Areas, DEHLG (2009) and accompanying Urban Design Manual-A Best Practise Guide (2009), and: (iii) The Design Manual for Urban Roads and Streets, DTTS and DECLG (2013) and the Urban Development and Building Heights: Guidelines for Planning Authorities (2018), in the preparation and review of town, village and settlement plans.</p>									<p>The actual implementation of the NPF and RSES is provided for in other policies so overall has a neutral effect on the environment.</p> <p>The Urban Development and Building Height Guidelines (2018) ensures that new residential development is managed alongside appropriate infrastructure regulations, a potential strain on existing services and utilities can be avoided, and additional infrastructure or capacity can be provided for as necessary. A positive effect on material assets and population and human health is therefore identified. The limitations set on building heights will also have a potential positive effect on landscape and visual due to minimised obstruction of views.</p>
Objectives: Settlement Strategy										
SO1	Support the sustainable long-term growth of the Key Towns (Naas and Maynooth) and the area to the north-east of the county located within									<p>This is as opposed to supporting the sustainable long-term growth of the named towns of ‘Leixlip, Maynooth, Celbridge and Kilcock’ as stated in the original CDP – this Variation focuses growth on the Key Towns which are identified as being Maynooth and Naas as well as a more generalised area in the ‘North-East of the County within the MASP.’ The new</p>

Ref	Policy/Objective	SEA Environmental Objectives							Commentary
		Biodiversity	Population & Human Health	Land & Soils	Water	Air, Noise & Climate	Heritage	Landscape & Visual	
	the MASP and zone additional lands, where appropriate, to meet the requirements of the Core Strategy and Settlement Hierarchy of this Plan.								<p>statement covers growth in a wider area by not only specifying individual towns while still emphasizing growth in the Key Towns – allowing for more natural sustainable growth.</p> <p>This policy change is related to reduced level of growth compared to the original policy. This will have potential for an overall positive effect on the environment as there will be less pressure on resources. However, a potential neutral effect on population and human health is predicted due to a potential positive effect on human health from reduced development alongside a negative effect on population as the target is for overall reduced population growth.</p>
SO2	Carry out a strategic Land Use, Employment and Transportation Study of north east Kildare including the Dublin Metropolitan Area towns of Leixlip, Maynooth, Celbridge and Kilcock. The preparation of the study will have regard to existing and emerging local area plans. It is envisaged that the study will involve the participation of all strategic stakeholders, including the National Transportation Authority, adjoining local authorities (i.e. Meath, Fingal and South Dublin County Councils), the Regional Assembly, transportation providers, Waterways Ireland, Government Departments and Environmental Agencies.								<p>This minor Variation changes the wording slightly to remove Collinstown from the list of towns in the study area and specifies the Metropolitan Area as being the ‘Dublin Metropolitan Area.’ With Collinstown located in between Leixlip and Maynooth growth can be assumed in this area. These are small changes that do not have significant consequences therefore a potential neutral effect on the environment is expected.</p>

Ref	Policy/Objective	SEA Environmental Objectives								Commentary
		Biodiversity	Population & Human Health	Land & Soils	Water	Air, Noise & Climate	Heritage	Landscape & Visual	Material Assets	
SO4	Ensure that the scale and form of developments envisaged within towns and villages is appropriate to their position within the overall Settlement Hierarchy. Due regard will be given to the Sustainable Residential Development in Urban Areas - Guidelines for Planning Authorities, DEHLG (2009), the accompanying Urban Design Manual – A Best Practice Guide (2009), Urban Development and Building Height Guidelines (2018) and the Urban Design Guidelines contained within Chapter 15 of this Plan.									<p>This Variation consists of the addition of the ‘Urban Development and Building Height Guidelines (2018)’ to the list of plans and policies mentioned in the objective as written in the original CDP.</p> <p>The Urban Development and Building Height Guidelines (2018) ensures that new residential development is managed alongside appropriate infrastructure regulations, a potential strain on existing services and utilities can be avoided, and additional infrastructure or capacity can be provided for as necessary. A positive effect on material assets and population and human health is therefore identified. The limitations set on building heights will also have a potential positive effect on landscape and visual due to minimised obstruction of views.</p>
SO9	Sequentially develop lands within towns and villages in accordance with									

Ref	Policy/Objective	SEA Environmental Objectives								Commentary
		Biodiversity	Population & Human Health	Land & Soils	Water	Air, Noise & Climate	Heritage	Landscape & Visual	Material Assets	
	the Development Plan Guidelines, DEHLG (2007) including any updated guidelines and deliver at least 30% of all new homes that are targeted in settlements within their existing built-up footprint (defined by the CSO).									<p>This Variation includes the additional consideration of updates to the Development Plan Guidelines as well as the additional delivery of ‘at least 30% of all new homes that are targeted in settlements within their existing built-up footprint.’</p> <p>These changes are not significant relevant to the original objective with no implications on implementation, therefore, an overall neutral effect on the environment is predicted.</p>
SO11	Prepare an Infrastructural Assessment for local area plans to inform the zoning of land based on their potential to be serviced.									<p>The previous objective is replaced with the introduction of the requirement for an Infrastructural Assessment for local area plans to inform the zoning of land based on their potential to be serviced.</p> <p>This would result in an overall neutral environmental effect as there is little implications resulting from the implementation of this change. However, there would be a potential positive effect on material assets as the Infrastructural Assessment will be servicing the development.</p>

9 Mitigation Measures and Monitoring

9.1 Mitigation Measures

Mitigation measures are measures envisaged and designed to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the Variation to the Kildare County Development Plan. All potential effects have been identified as neutral or positive, therefore, specific mitigation measures do not need to be considered.

The primary mitigation measure is to ensure the sustainable and appropriate development of County Kildare without compromising the integrity of the natural and built environment. All new development that requires an Environmental Impact Assessment (EIA) in accordance with EIA legislation will address the range of environmental objectives, indicators and targets.

9.2 SEA Monitoring

Article 10 of the SEA Directive requires that monitoring should be carried out in order to identify at an early stage any unforeseen adverse effects associated with the implementation of the Variation.

A monitoring programme is developed based on the indicators selected to track progress towards achieving strategic environmental objectives and reaching targets, enabling effects on the environment to be measured. As previously described, the environmental indicators have been developed to show changes that would be attributable to implementation of the Variation.

The SEA carried out has ensured that any potential significant environmental effects have been identified and given due consideration.

KCC is responsible for collating existing relevant monitored data, the preparation of preliminary and final monitoring evaluation reports, the publication of these reports and, if necessary, the carrying out of corrective action.

Table 8.2: Monitoring Programme

Environmental Category	Target	Indicators	Data Sources, Responsibility, and Frequency
Biodiversity including Flora and Fauna	<p>Consider siting of new development on non-sensitive sites.</p> <p>Improve/conserves and protect all designated sites and species within County Kildare.</p> <p>Deliver the requirement of the Habitats Directive (Article 4, Paragraph 4) for the maintenance or restoration of annexed habitats and species within SACs at a “favourable conservation status.</p> <p>Promote the maintenance and, as appropriate, achievement of favourable conservation status of habitats and species, in association with the NPWS and other stakeholders.</p> <p>Protect SPAs, Annex I bird species, and regularly occurring migratory bird species and their habitats, and avoid pollution or deterioration of important bird habitats outside SPAs.</p> <p>Improve the ecological coherence of Natura 2000 by encouraging the management of, maintaining, and where appropriate developing, features of the landscape which are of major importance for wild fauna and flora. Such features are those which, by virtue of their linear and continuous structure (such as rivers with their banks or the traditional systems for marking field boundaries) or their function as stepping stones (such as ponds or small woods), are essential for the migration, dispersal and genetic exchange of wild species.</p> <p>Protect NHAs, National Parks, Nature Reserves, Wildfowl Sanctuaries, Refuges for Fauna or Flora and sites proposed for designation.</p> <p>Improve/maintain protection for important wildlife sites, particularly urban wildlife corridors and linear and stepping stone features for migration, dispersal and exchange of wildlife.</p> <p>Improve access for the appreciation and promotion of wildlife.</p>	<p>Census population data</p> <p>Number and extent of Protected Sites.</p> <p>Areas actively managed for conservation.</p> <p>Population and range of Protected Species.</p> <p>Achievement of the Objectives of Biodiversity Plans</p>	<p>Sources: Kildare County Council, National Parks and Wildlife Services, Fisheries Board and EPA.</p> <p>Responsibility: Kildare County Council</p> <p>Frequency: Align with monitoring evaluation report on the effects of implementing Kildare County Development Plan.</p>

Environmental Category	Target	Indicators	Data Sources, Responsibility, and Frequency
Population and Human Health	<p>Minimise population exposure to high levels of noise, vibration and air pollution.</p> <p>Increase modal shift to public transport.</p> <p>Co-ordinate land use and transportation policies.</p> <p>Improve access to recreation opportunities.</p>	<p>Census population data.</p> <p>Rates of Unemployment per area.</p> <p>Dependency ratio</p> <p>Deprivation Index</p> <p>Commuting times and modes of transport.</p> <p>% increase in housing (number and type).</p>	<p>Sources: Kildare County Council and Central Statistics Office.</p> <p>Responsibility: Kildare County Council</p> <p>Frequency: Align with monitoring evaluation report on the effects of implementing Kildare County Development Plan.</p>
Land and Soils	<p>Prevent pollution of soil through adoption of appropriate environmental protection procedures during construction and maintenance works on site.</p> <p>Ensure polluting substances are appropriately stored and banded.</p> <p>Ensure appropriate management of existing contaminated soil in accordance with the requirements of current waste legislation.</p> <p>Re-use of brownfield lands, rather than developing Greenfield lands, where possible.</p> <p>Minimise the consumption of non-renewable sand, gravel and rock deposits.</p>	<p>Rates of re-use/recycling of construction waste.</p> <p>Rates of quarrying.</p> <p>Rates of brownfield site and contaminated land reuse and development.</p> <p>Rates of greenfield development.</p>	<p>Sources: Kildare County Council and Environmental Protection Agency.</p> <p>Responsibility: Kildare County Council</p> <p>Frequency: Align with monitoring evaluation report on the effects of implementing Kildare County Development Plan.</p>
Water Resources	<p>Support the achievement of “good” ecological and chemical status/potential of waterbodies in accordance with the Water Framework Directive.</p> <p>Minimise flood risk through appropriate management of flood vulnerable zones.</p> <p>Promote sustainable drainage practices to improve water quality and flow</p>	<p>Compliance of potable water sources to water quality regulations.</p> <p>Compliance of surface waters with national and international standards.</p> <p>Potable and wastewater treatment capacities versus population.</p> <p>% of wastewater requiring treatment.</p> <p>Achievement of the Objectives of the River Basin Management Plans.</p> <p>Amount of new developments within flood plains.</p>	<p>Sources: Kildare County Council, Environmental Protection Agency and Fisheries Board.</p> <p>Responsibility: Kildare County Council</p> <p>Frequency: Align with monitoring evaluation report on the effects of implementing Kildare County Development Plan.</p>

Environmental Category	Target	Indicators	Data Sources, Responsibility, and Frequency
		Annual costs of damage related to flood events.	
Air, Noise and Climate	Minimise air and noise emissions during construction and operation of new developments. Promote reduction of greenhouse gas emissions to the atmosphere. Limiting climate change and adapting to climate change.	Traffic, Transport and Vehicular survey data. National and region-specific emission data. Compliance with national standards. Reduction in greenhouse gas emissions. Number and extent of emission licensed facilities. Number of energy/renewable energy production facilities. Rates of energy/renewable energy consumption.	Sources: Kildare County Council, Environmental protection Agency and Central Statistics Office. Responsibility: Kildare County Council Frequency: Align with monitoring evaluation report on the effects of implementing Kildare County Development.
Archaeological, Architectural and Cultural Heritage	Regeneration of derelict and underutilised heritage sites. Improve appearance of areas with particular townscape character. Improve protection for protected archaeological sites and monuments and their settings, protected structures and conservation areas and areas of archaeological potential. Enhance access to sites of heritage interest.	Updating of inventories to include new sites/features. Achieving the objectives of development plans regarding heritage protection. Range and extent of areas of heritage potential. Range and extent of areas of special planning controls.	Sources: Kildare County Council and Department of Environment Community and Local Government. Responsibility: Kildare County Council Frequency: Align with monitoring evaluation report on the effects of implementing Kildare County Development.
Landscape and Visual	Improve protection for landscapes of recognised quality. Maintain clear urban/rural distinctions. Enhance provision of, and access to, green space in urban areas. Ensure development is sensitive to its surroundings.	Range and extent of Amenity Landscapes. Rates of development within designated landscapes. Rates of urban expansion.	Sources: Kildare County Council and Department of Environment, Community and Local Government. Responsibility: Kildare County Council

Environmental Category	Target	Indicators	Data Sources, Responsibility, and Frequency
		Rates of deforestation. Rates of agricultural land re-development. % change of land use from rural to urban.	Frequency: Align with monitoring evaluation report on the effects of implementing Kildare County Development Plan.
Material Assets	Improve availability and accessibility of commercially provided facilities and public services. Increase local employment opportunities. Improve efficiencies of transport, energy and communication infrastructure. Promotion of sustainable transport infrastructure i.e. increased public transport. Reduce the generation of waste and adopt a sustainable approach to waste management.	Location/level of Infrastructure. Achievement of development plan objectives. Rates of deprivation. Rate of waste disposal to landfill statistics. Range and extent of recycling facilities and services. Rates of recycling.	Sources: Kildare County Council, Central Statistics Office, National Roads Authority and Environmental Protection Agency. Responsibility: Kildare County Council Frequency: Align with monitoring evaluation report on the effects of implementing Kildare County Development Plan.

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CORINE Land Cover (CLC) Inventory, Environmental Protection Agency

European Communities (Drinking Water) Regulations (No. 2), 2007

GISEA Manual Improving the Evidence Base in SEA (EPA)

Appendix A

Figures

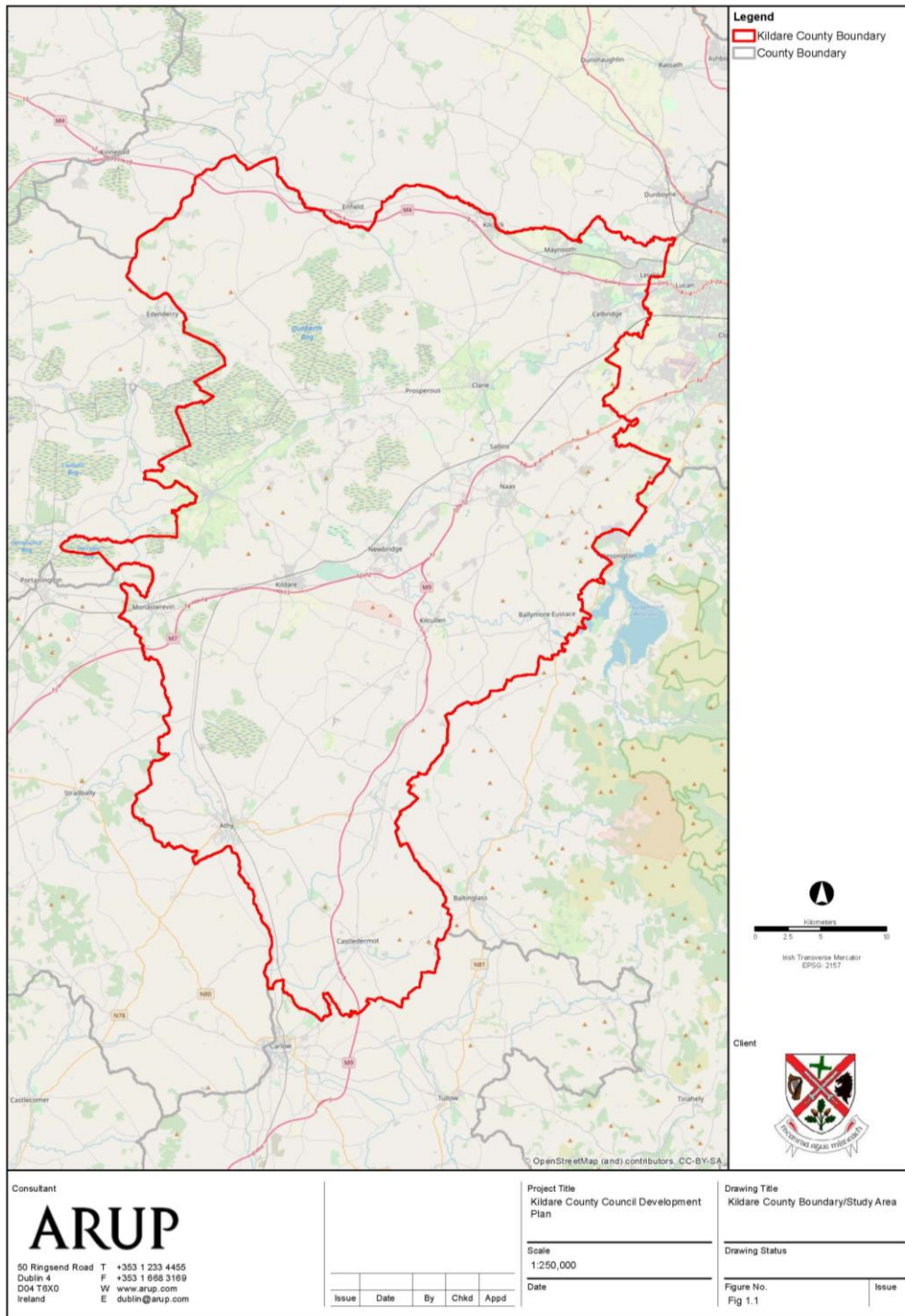


Figure 1.1: Kildare County Boundary

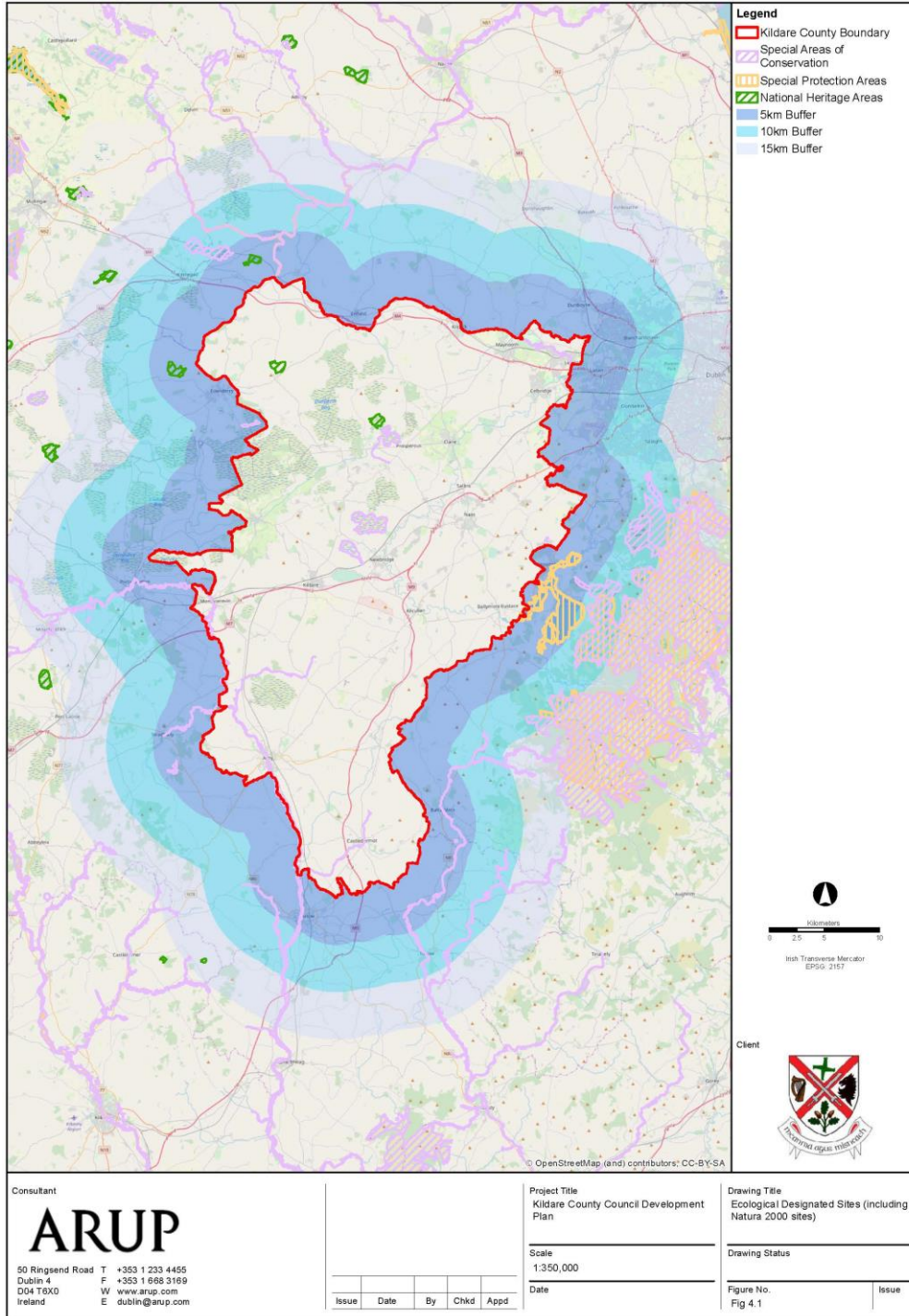


Figure 4.1: Ecological Designated Sites

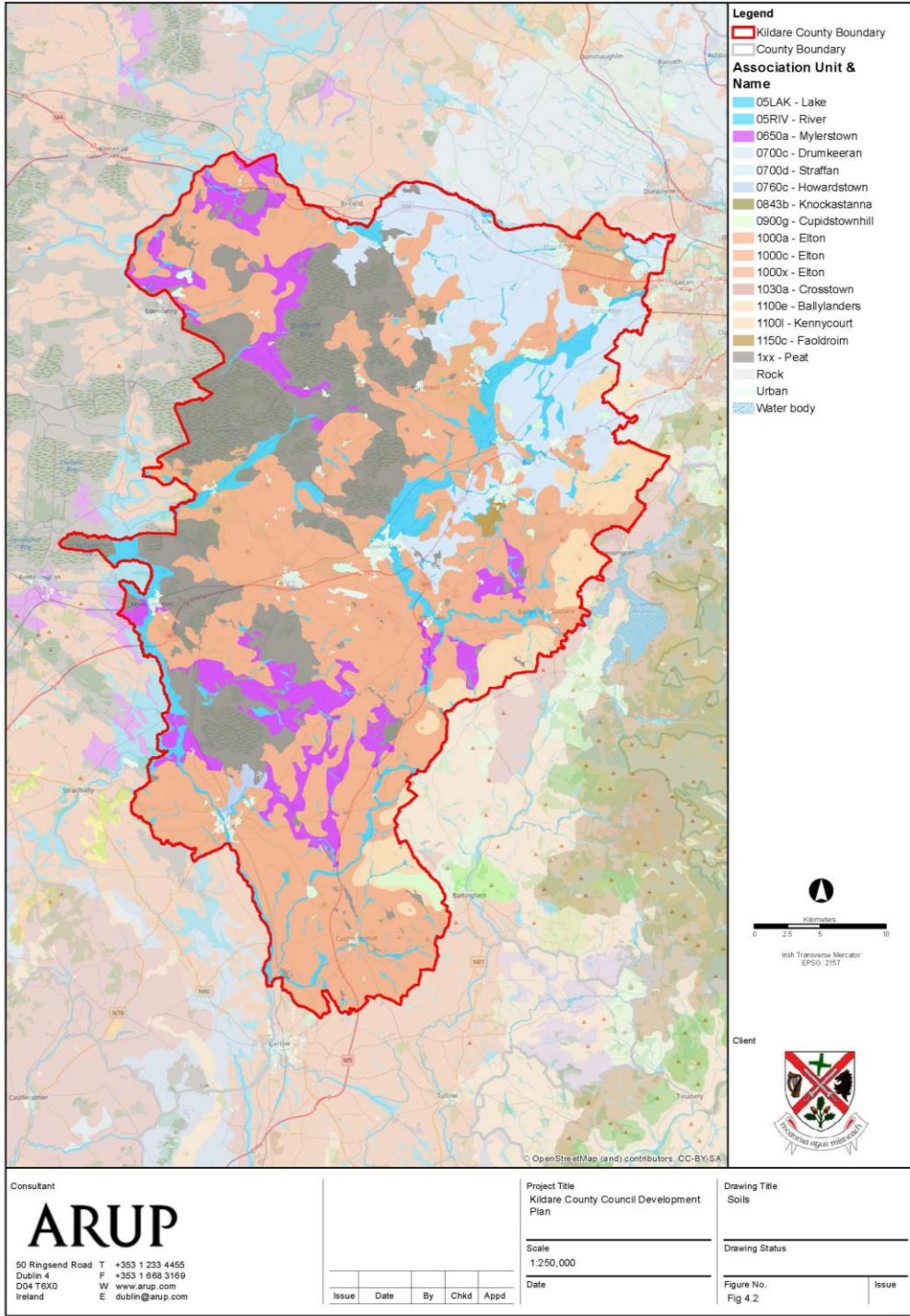


Figure 4.2: Soils

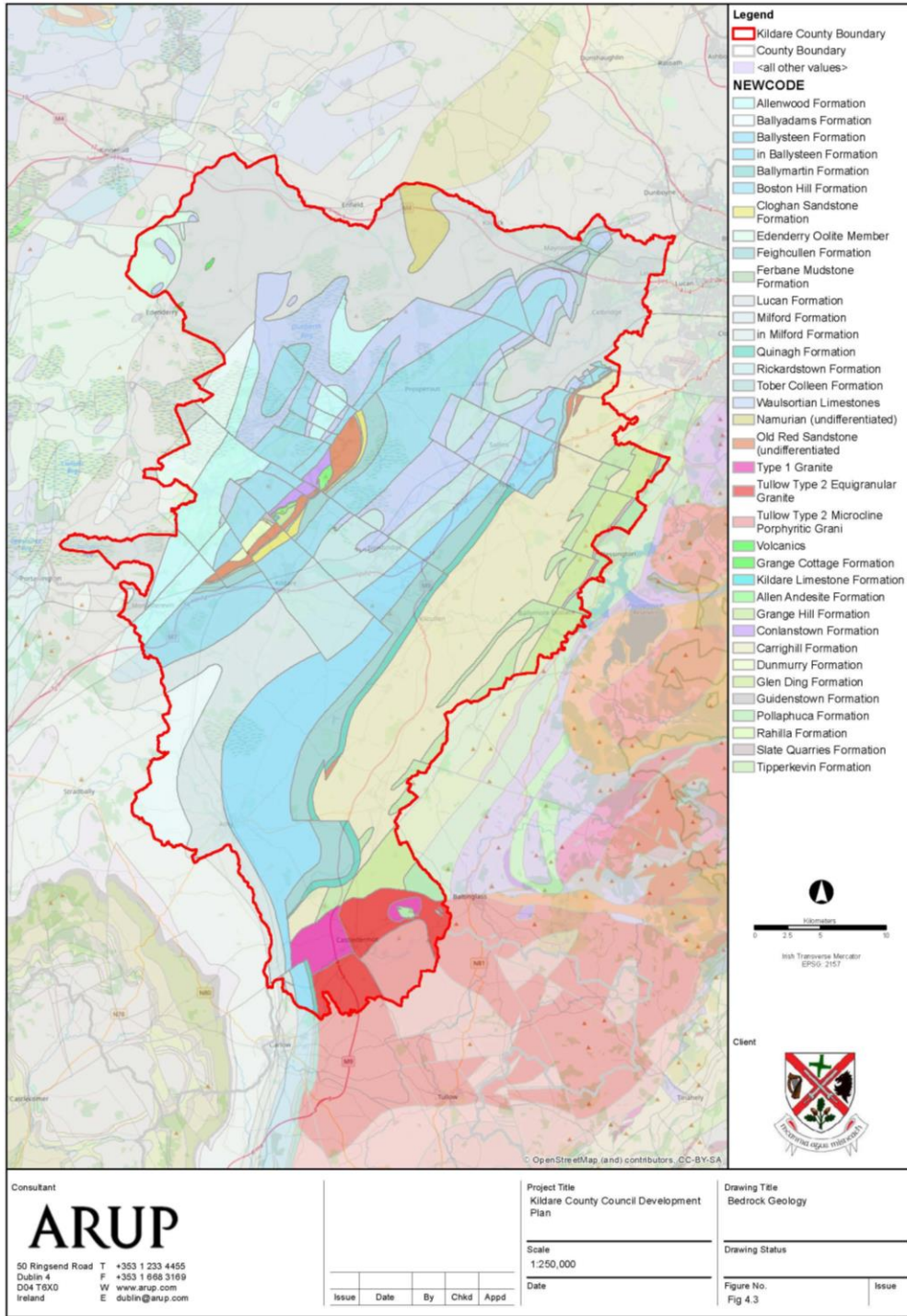


Figure 4.3: Bedrock Geology

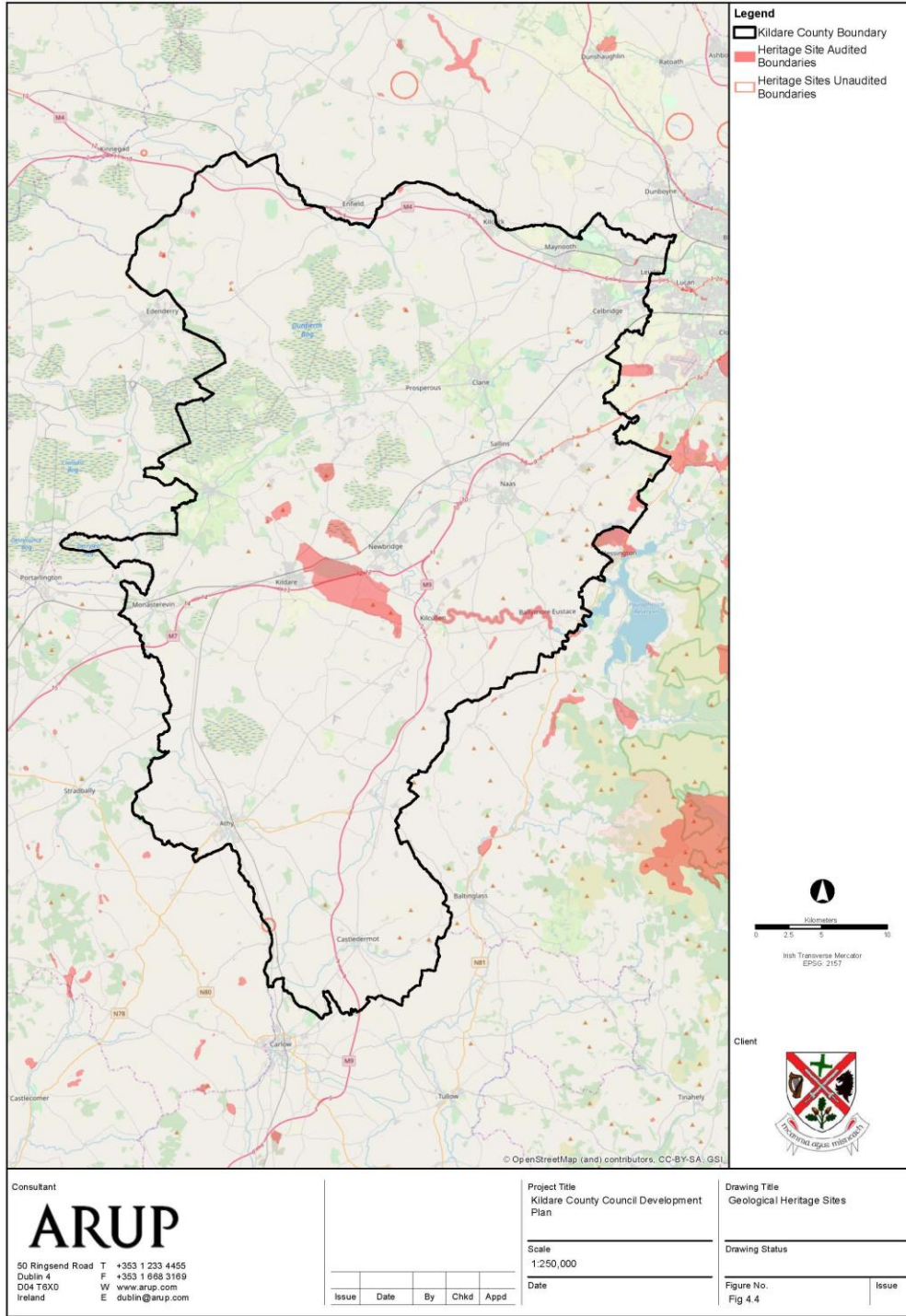


Figure 4.4: Geological Heritage Sites

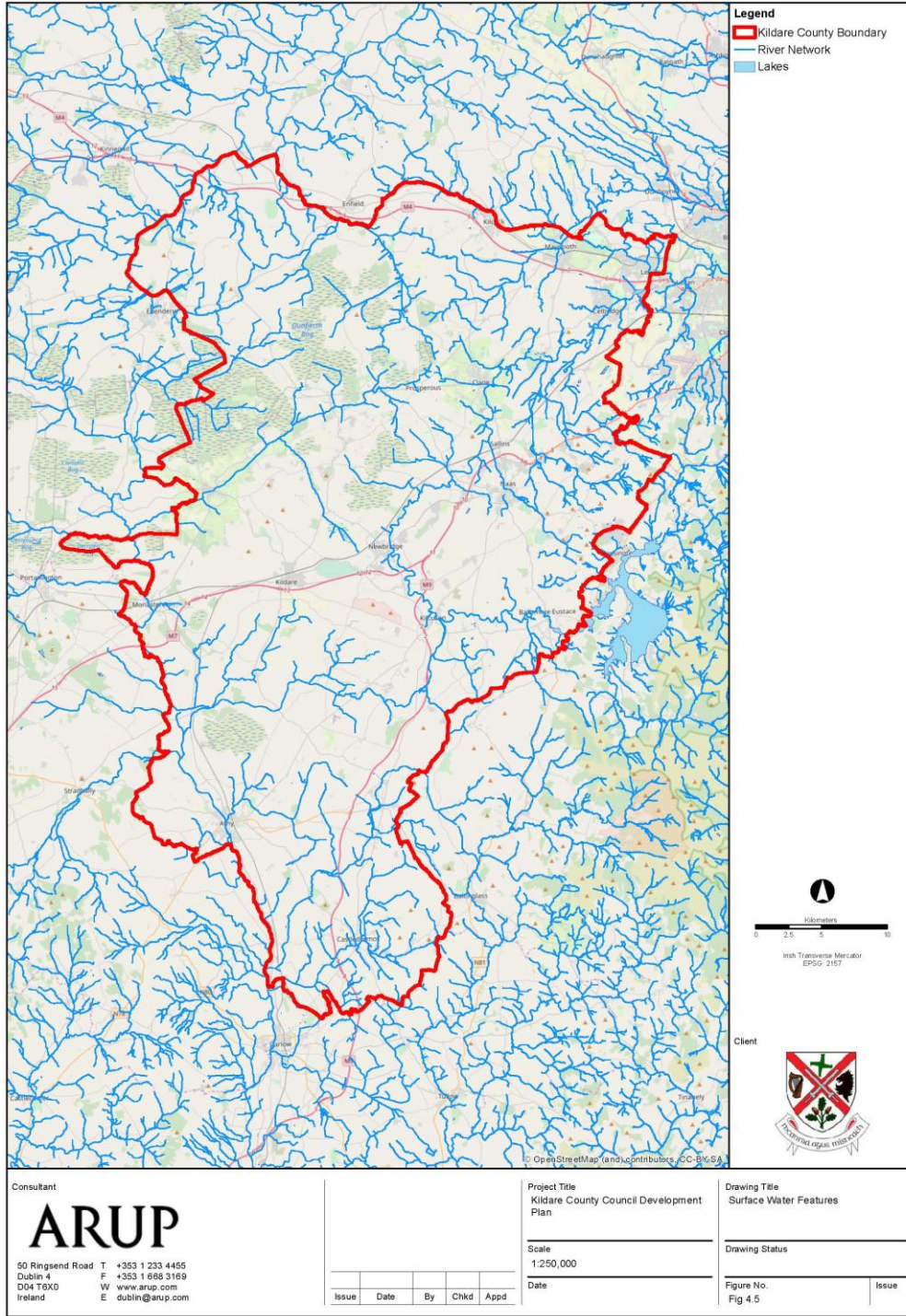


Figure 4.5: Surface Water Features

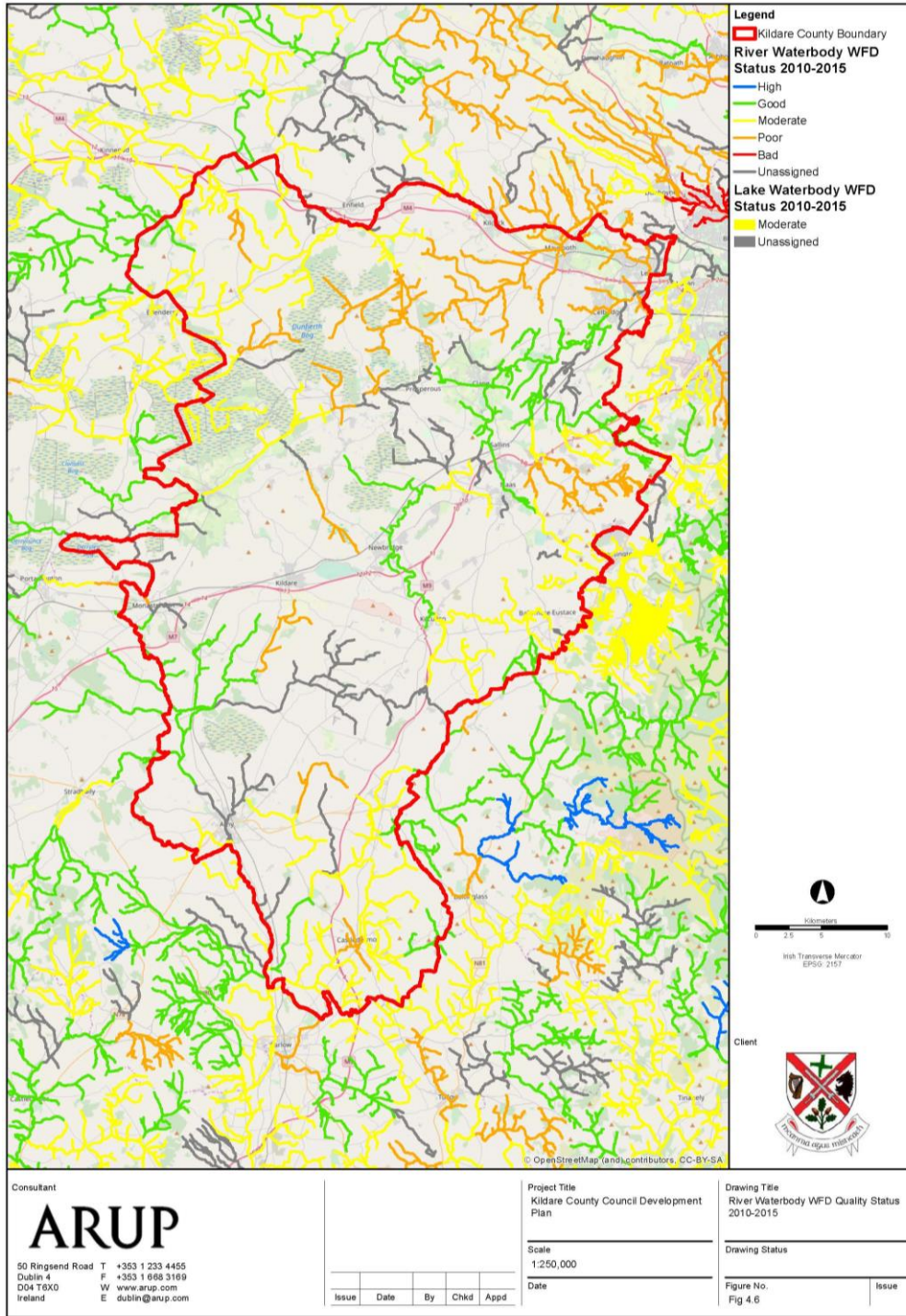


Figure 4.6: River Waterbody WFD Quality

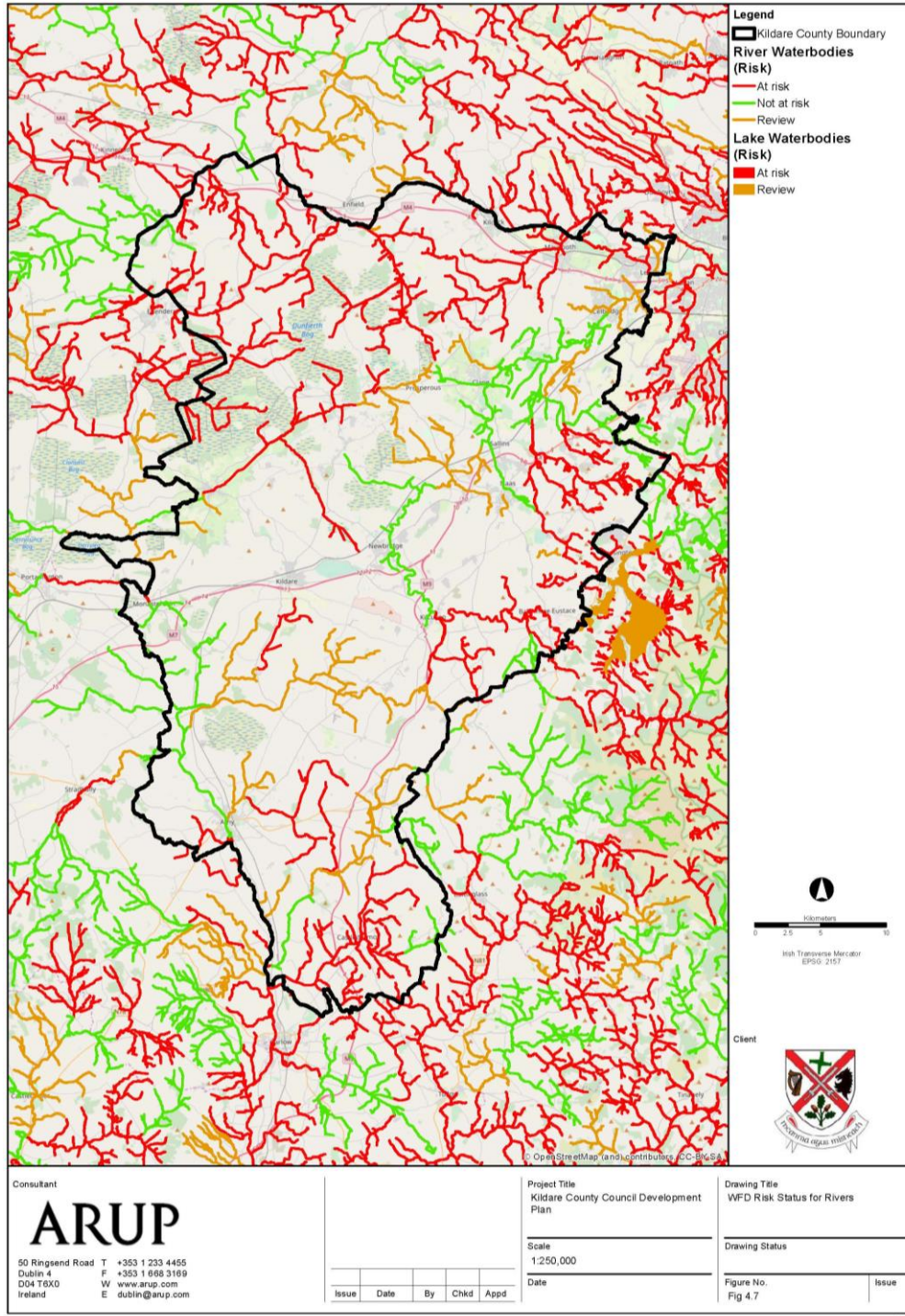


Figure 4.7: WFD Risk Status for Rivers

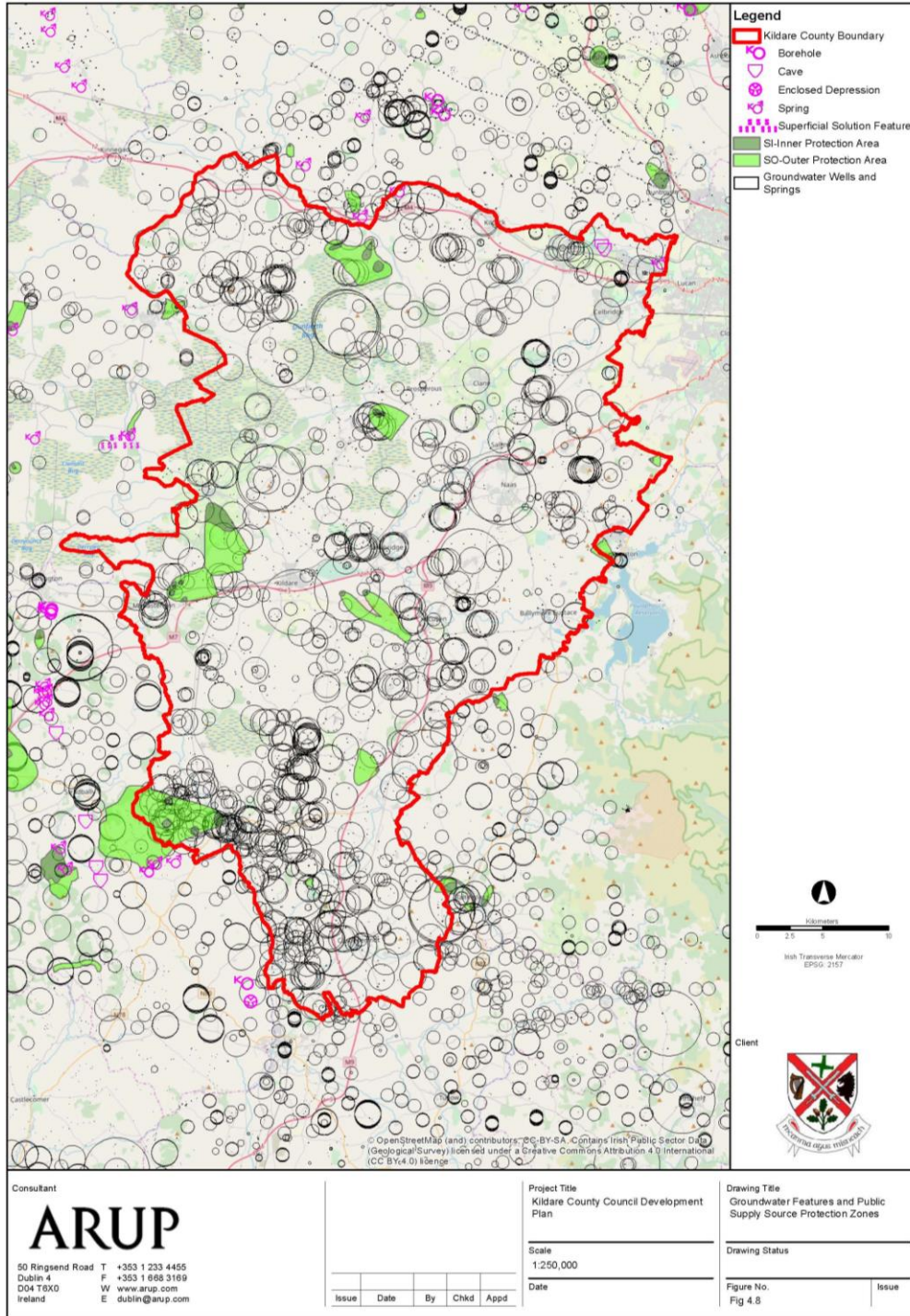


Figure 4.8: Groundwater Features and Protection

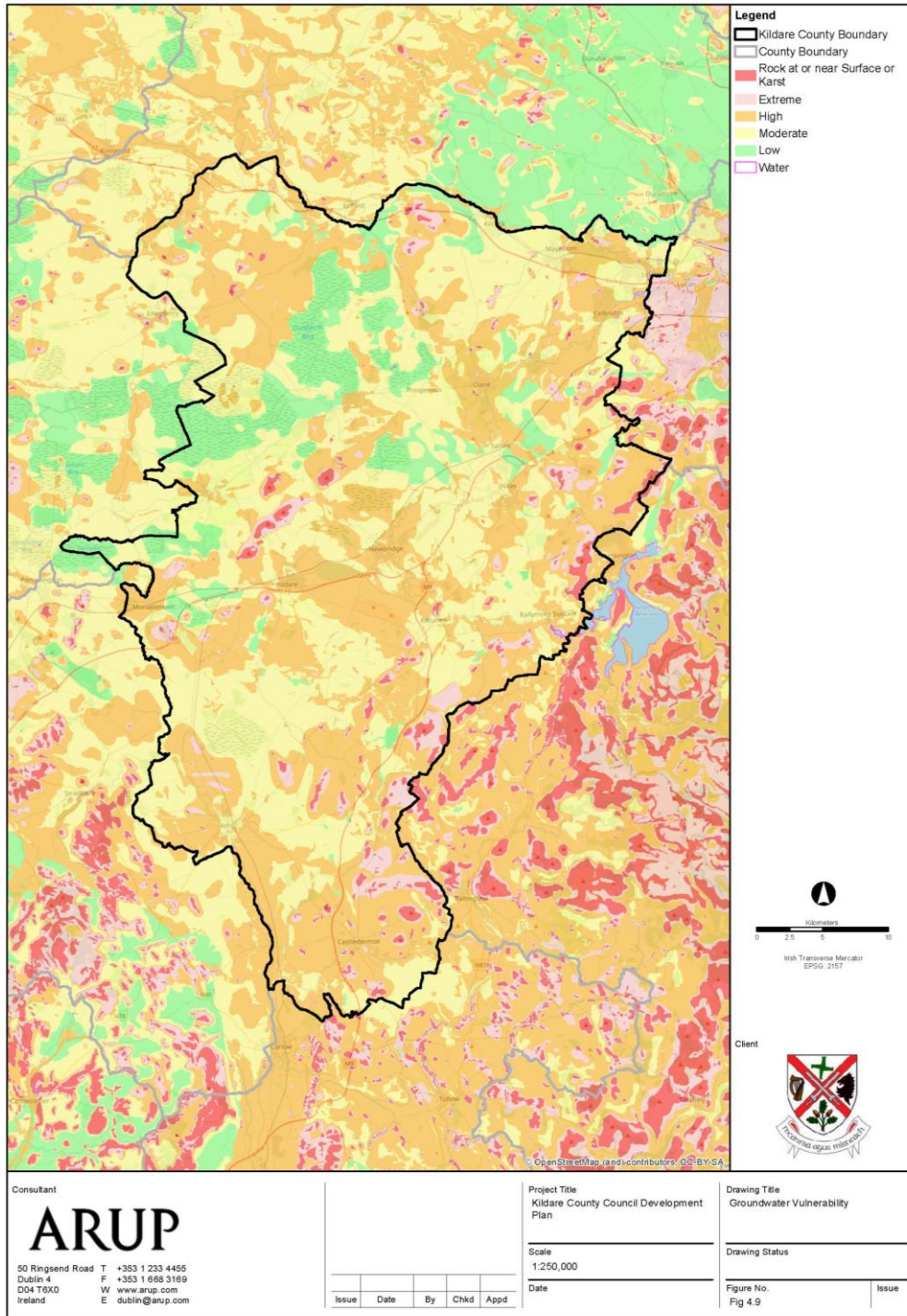


Figure 4.9: Groundwater Vulnerability

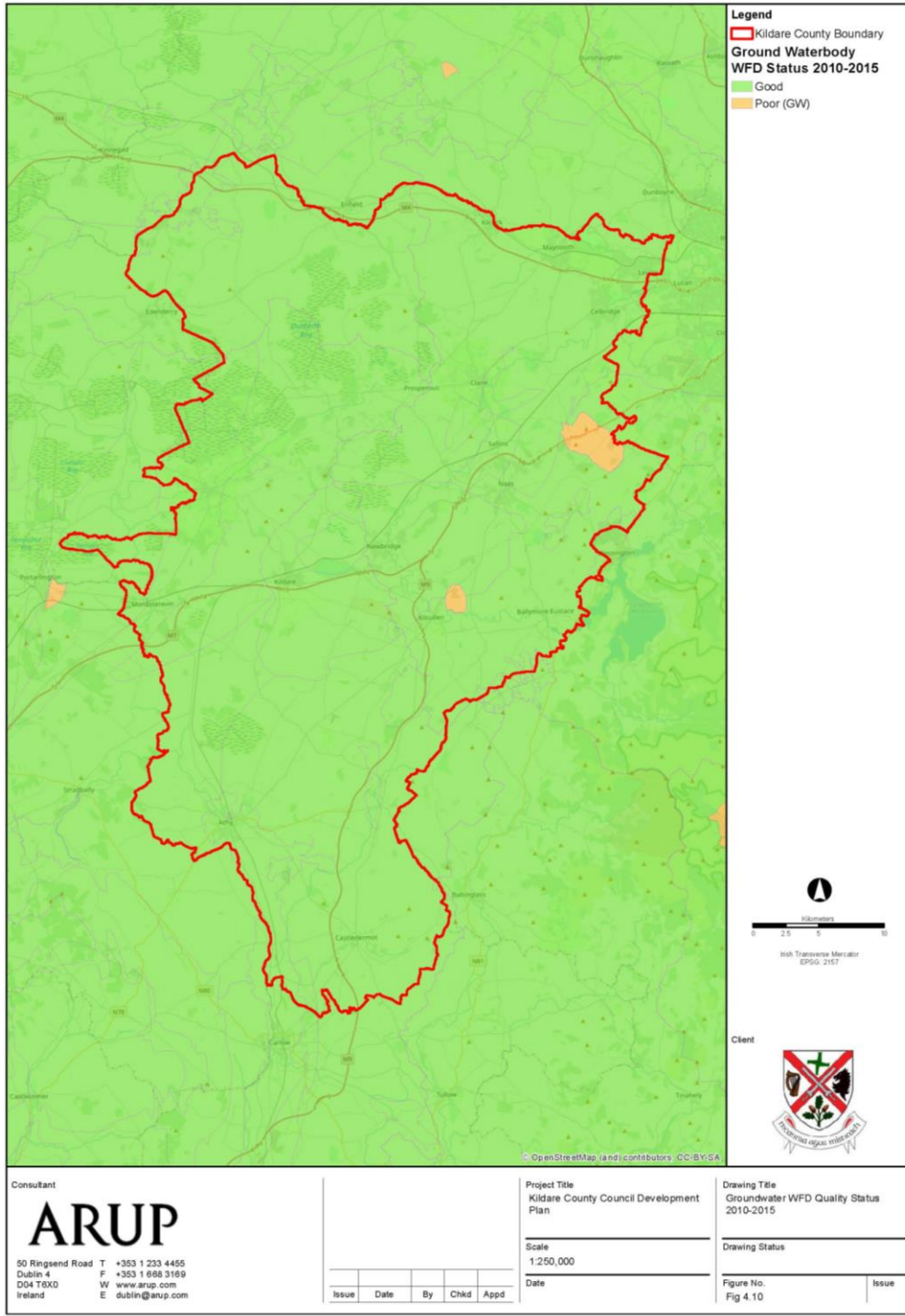


Figure 4.10: Groundwater WFD Quality Status

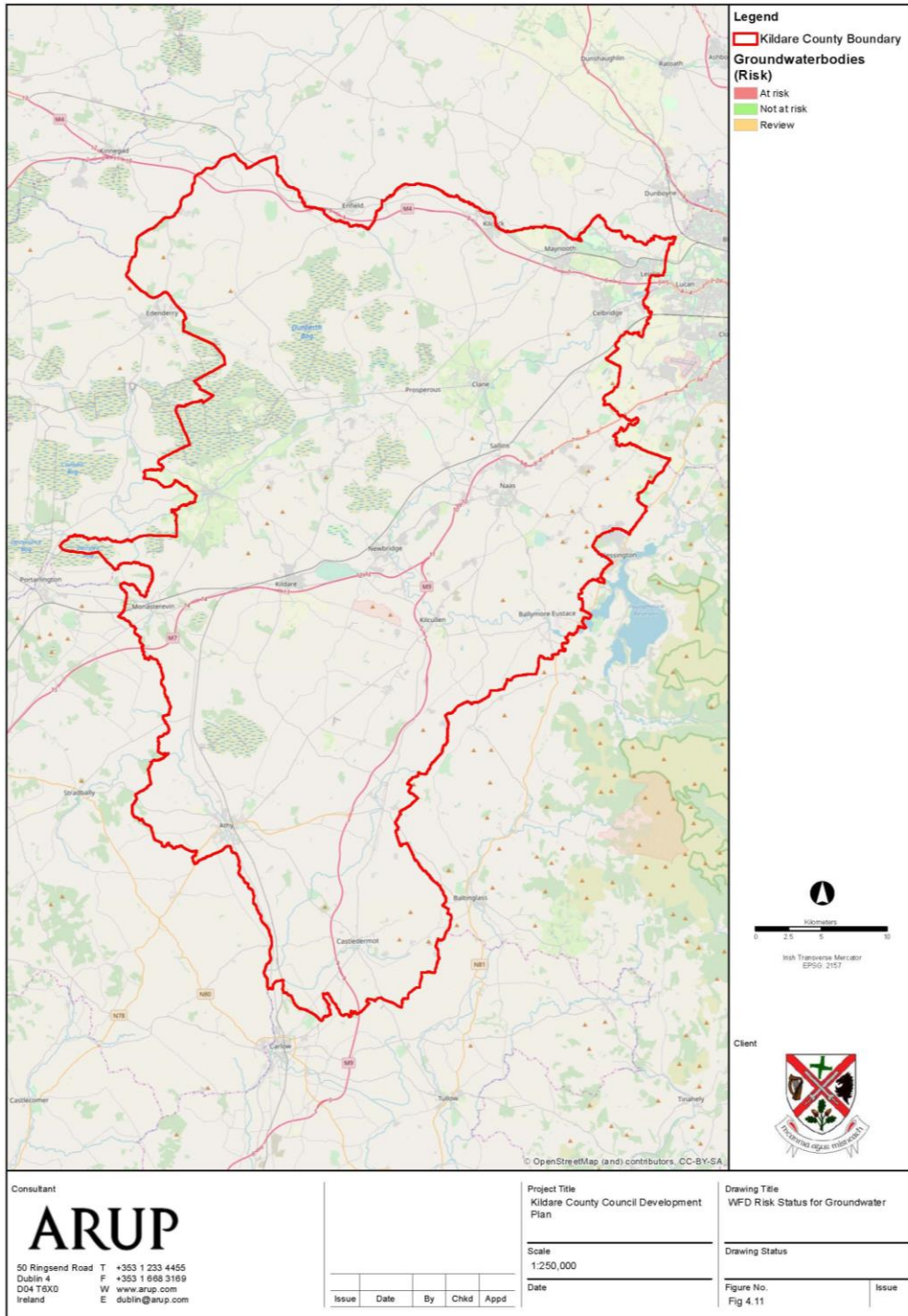


Fig 4.11: WFD Risk Status for Groundwater

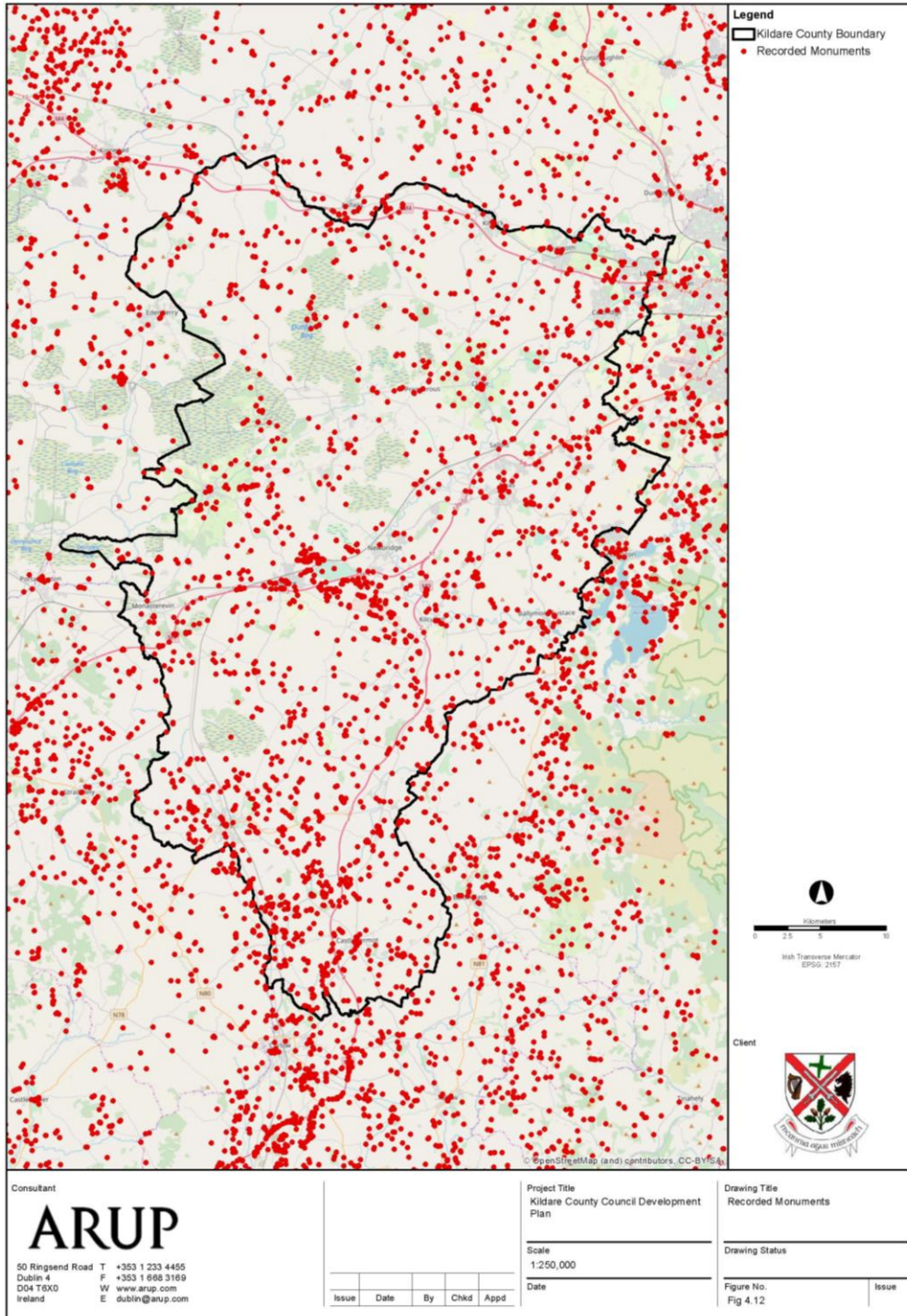


Figure 4.12: Recorded Monuments

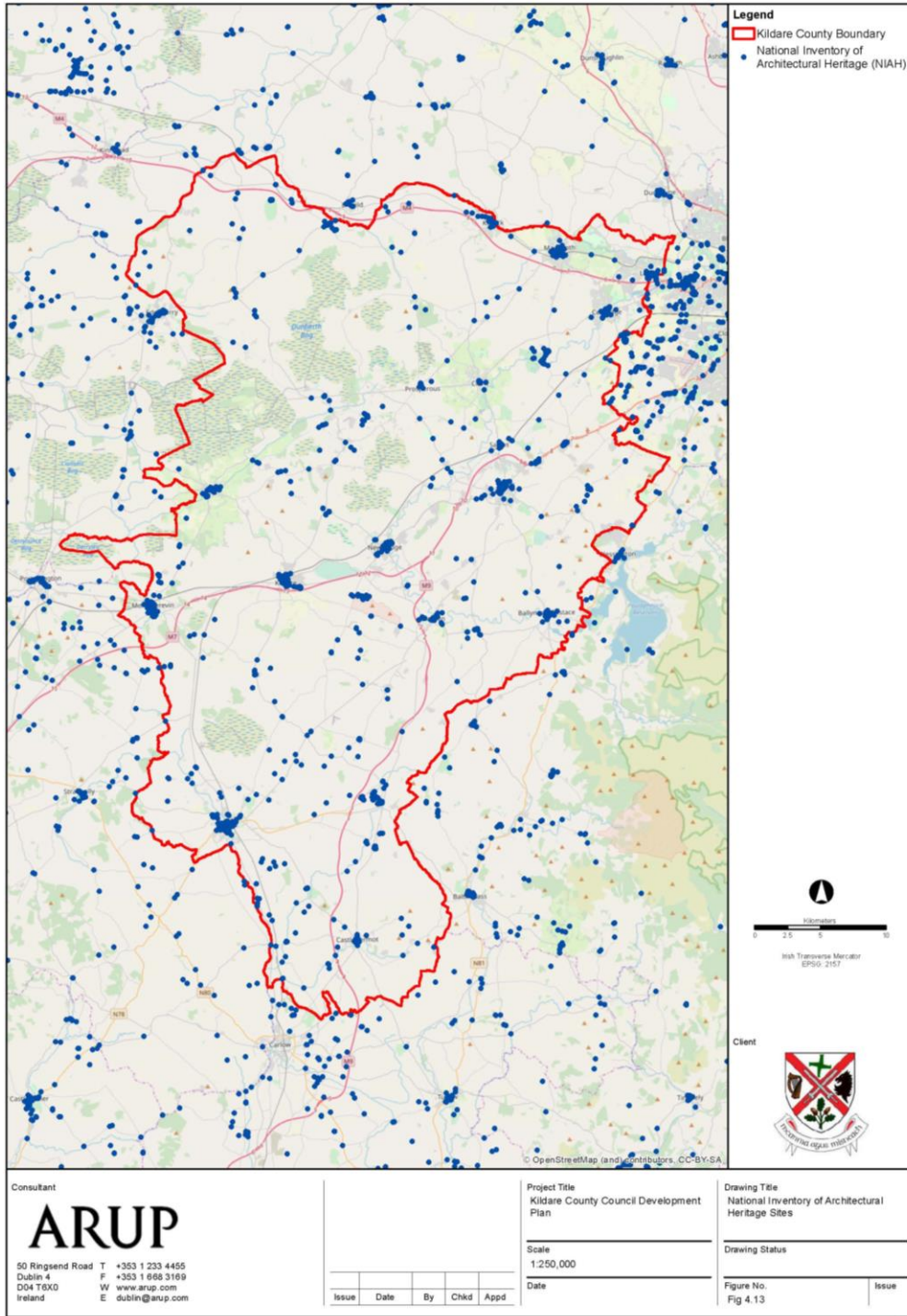


Figure 4.13: National Inventory of AHS

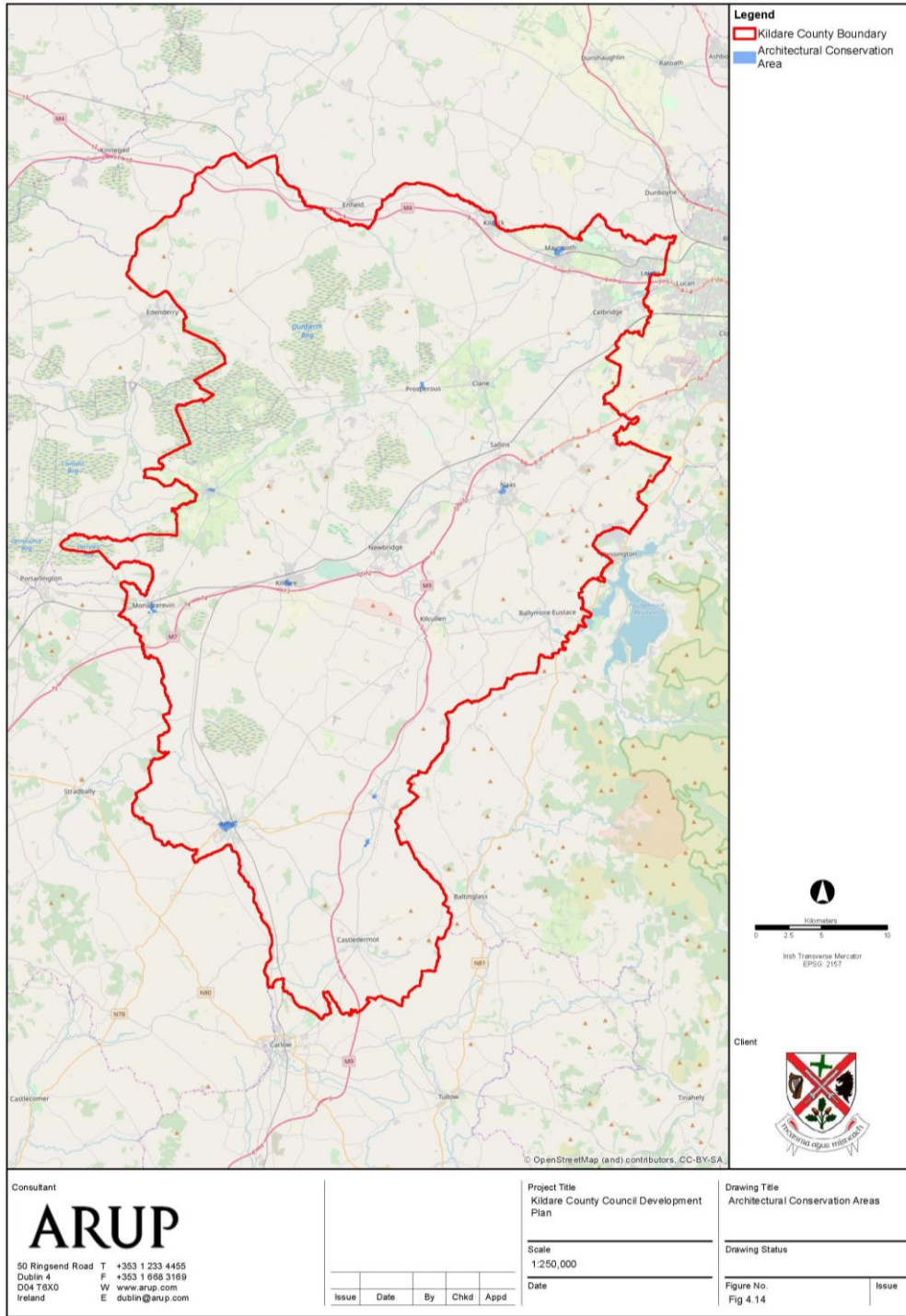


Figure 4.14: Architectural Conservation

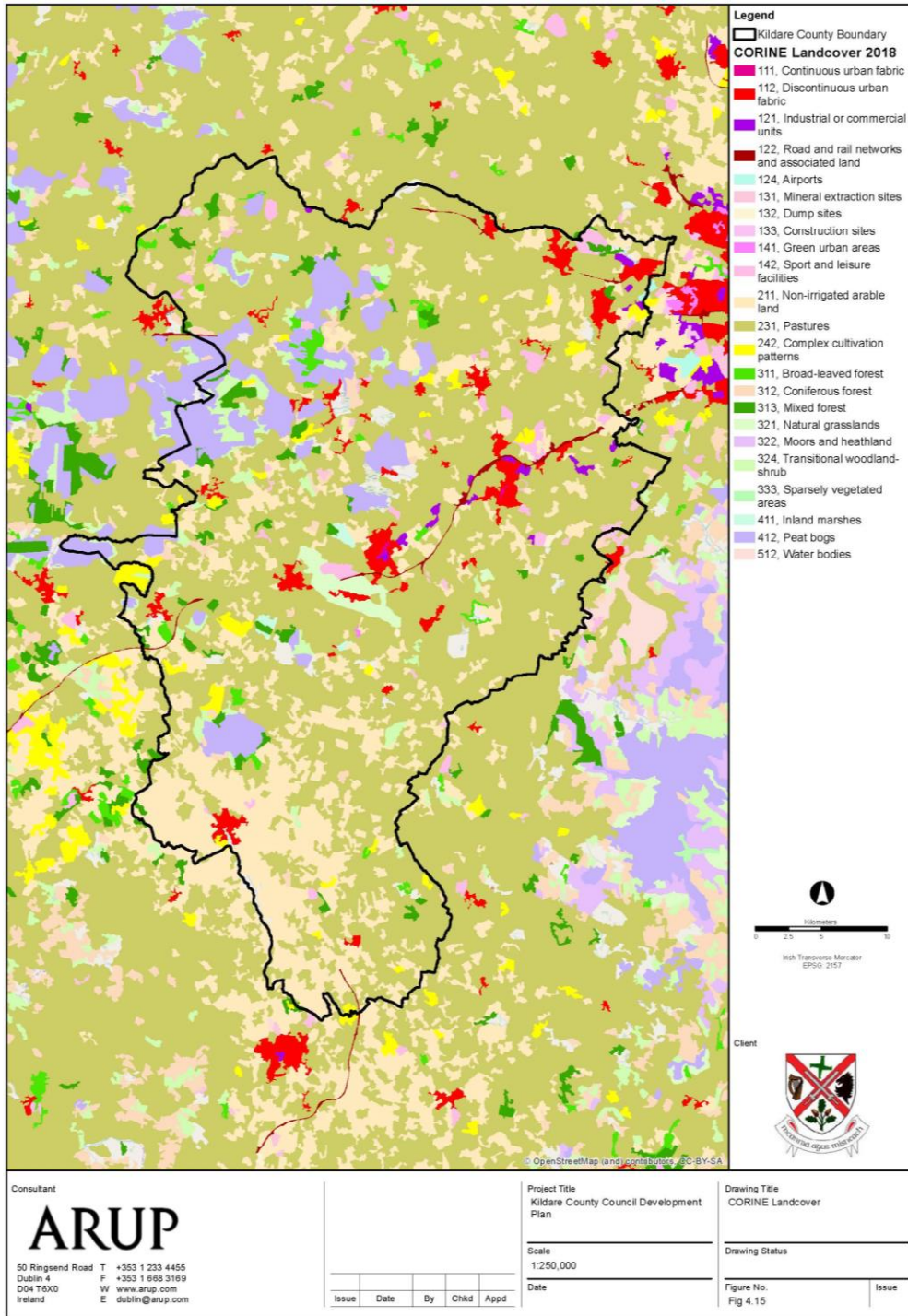


Figure 4.15: CORINE Landcover

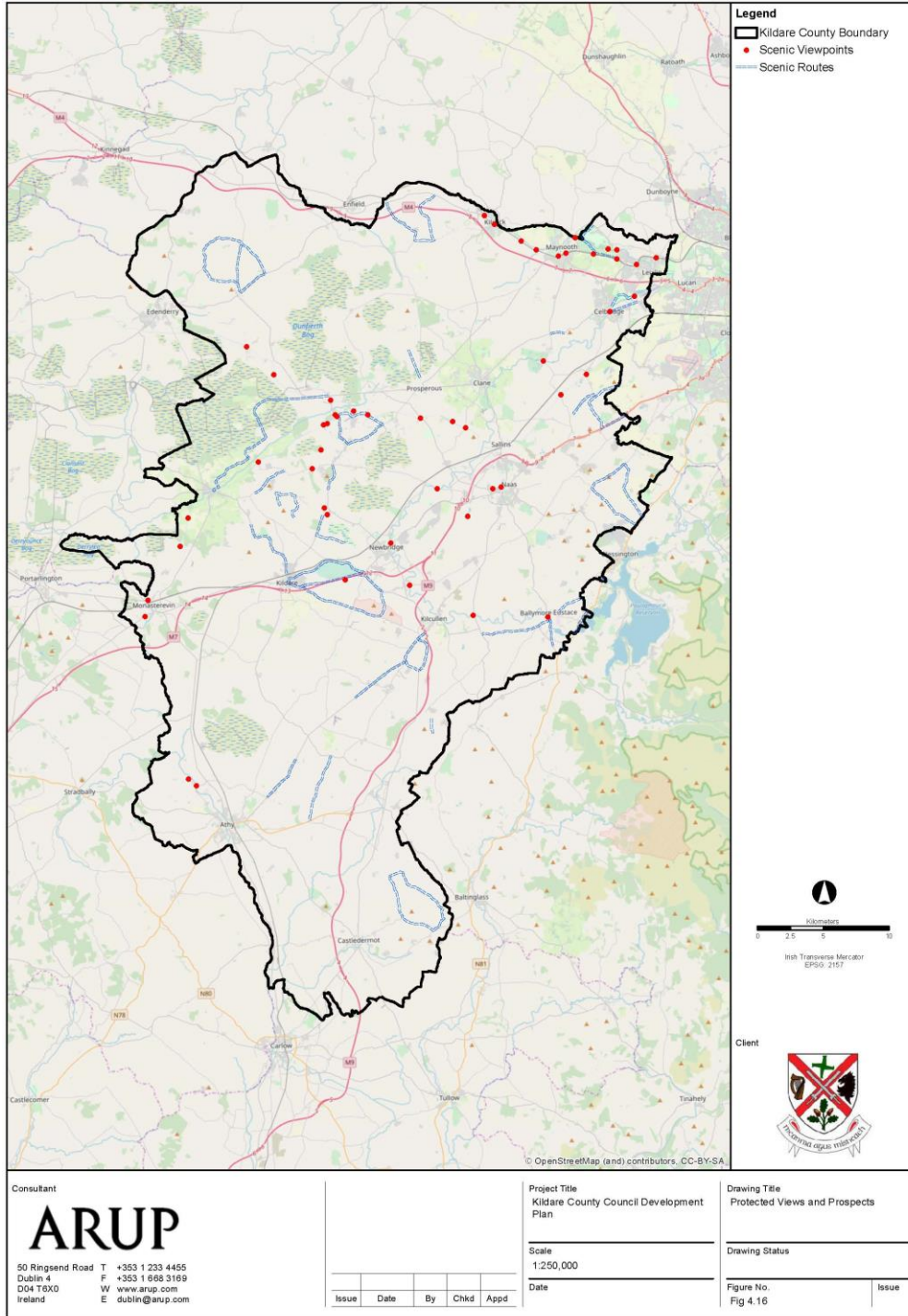


Figure 4.16: Protected Views and Prospects

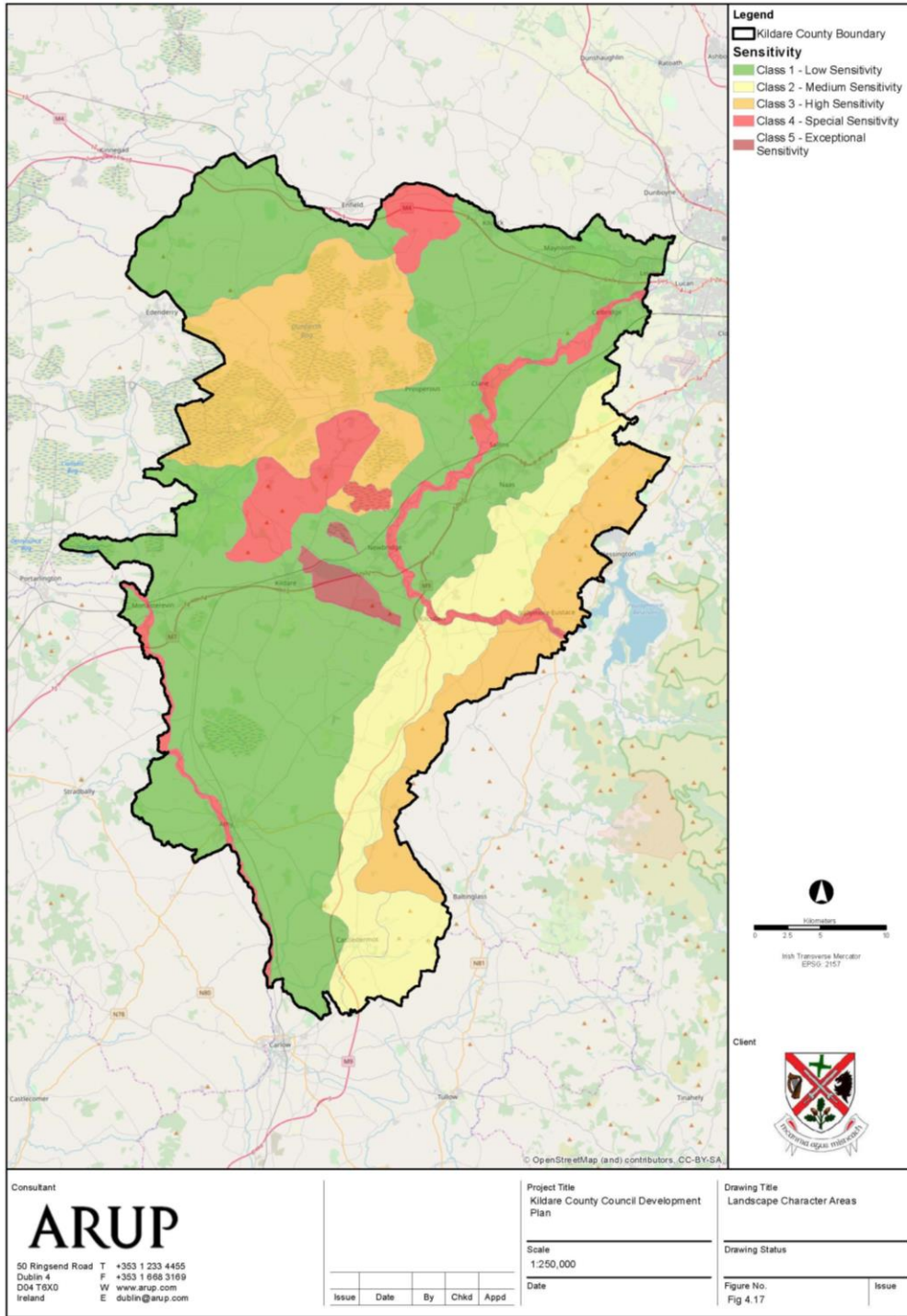


Figure 4.17: Landscape Character Areas

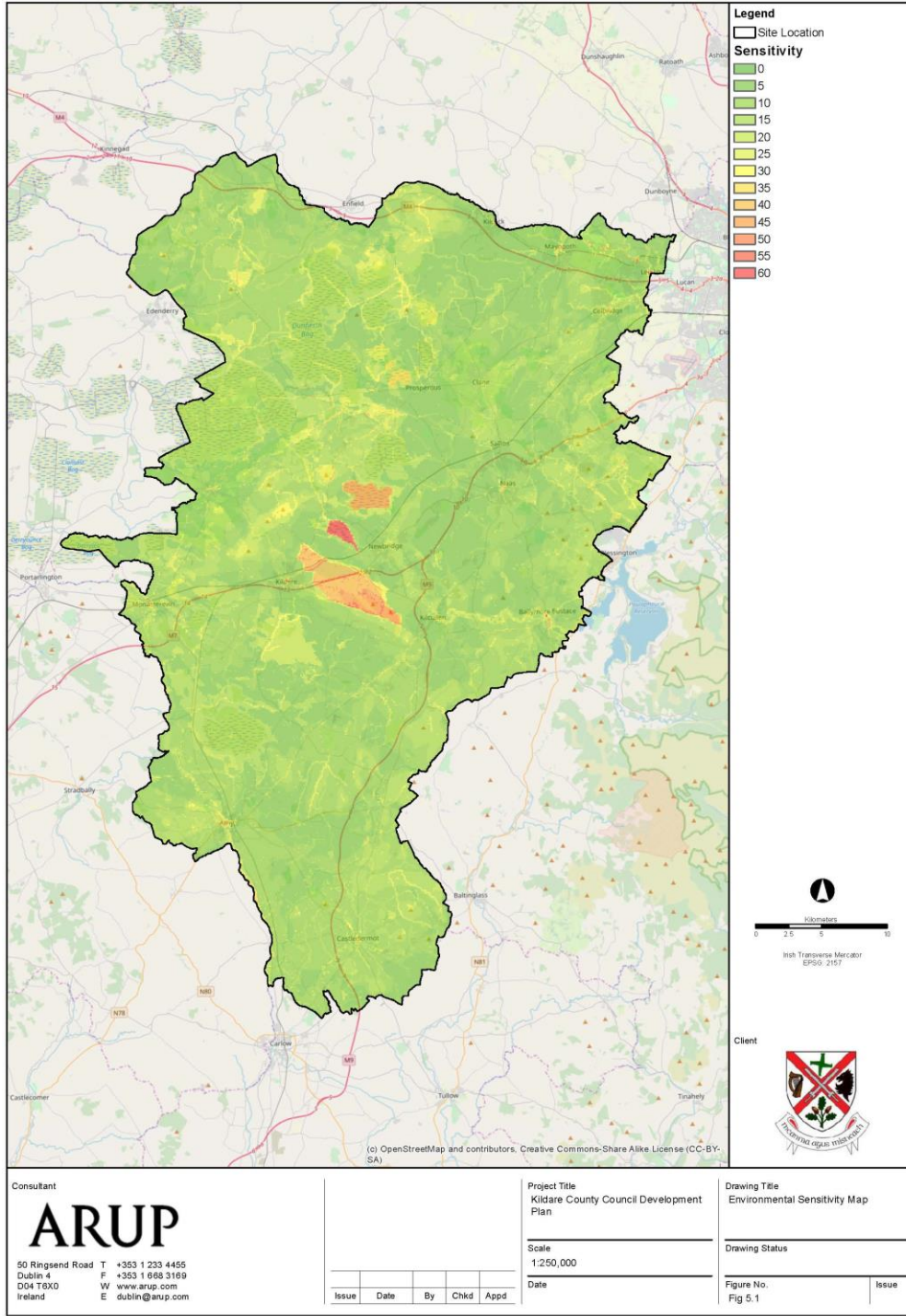


Figure 5.1: Environmental Sensitivity Map