

APPENDIX I NON TECHNICAL SUMMARY

ENVIRONMENTAL REPORT

OF THE

KILDARE COUNTY DEVELOPMENT PLAN 2011-2017

STRATEGIC ENVIRONMENTAL ASSESSMENT

for: Kildare County Council

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Naas
County Kildare



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Section 1 Introduction and Terms of Reference

This is the Non-Technical Summary of the Environmental Report of the Kildare County Development Plan 2011-2017 Strategic Environmental Assessment (SEA). The purpose of the Environmental Report is to provide a clear understanding of the likely environmental consequences of decisions regarding the future accommodation of growth in County Kildare.

What is an SEA?

SEA is a systematic process of predicting and evaluating the likely environmental effects of implementing a proposed plan, or other strategic action, in order to ensure that these effects are appropriately addressed at the earliest appropriate stage of decision-making on a par with economic and social considerations.

Why is it needed?

The SEA was carried out in order to comply with the provisions of the SEA Regulations and in order to improve planning and environmental management within Kildare. The output of the process are an Environmental Report and an SEA Statement, both of which should be read in conjunction with the County Development Plan.

How does it work?

All of the main environmental issues in Kildare were assembled and presented to the team who prepared the new Plan. This helped them to devise a plan that protects whatever is sensitive in the environment. It also helped to identify wherever there are environmental problems in the area - so that these won't get any worse - and ideally the plan tries to improve these.

To decide how best to make a plan that protects the environment as much as possible the planners examined alternative versions of the plan. This helps to highlight the type of plans that are least likely to harm the environment.

What is included in the Environmental Report which accompanies the Plan?

The Environmental Report contains the following information:

- A description of the environment and the key environmental issues;
- A description and assessment of alternatives for the Plan;
- An assessment of Plan policies and objectives; and,
- Mitigation measures which will aid compliance with important environmental protection legislation - e.g. the Water Framework Directive, the Habitats Directive - and which will avoid/reduce the environmental effects of implementing the Plan.

What happens at the end of the process?

On adoption of the Plan, an SEA Statement was prepared and made public.

The SEA Statement must include information on how environmental considerations have been integrated into the Plan and why the preferred alternative was chosen for the Plan in light of the other alternatives.

Section 2 The County Development Plan

2.1 Structure and Content

The Plan is set out in a written statement, with accompanying maps. It comprises 18 Chapters which can be grouped into the following sections as well as a number of appendices:

- Chapters 1 and 2 set out the introduction, strategic context and core strategy for the proper planning and sustainable development of County Kildare.
- Chapters 3-14 set out detailed policies and objectives for settlement, housing, economic development, movement and transport, water, drainage and environmental services, energy and communications, retail, rural development, social and community development, heritage and landscape.
- Chapters 15 and 16 outline urban and rural design guidance to promote quality developments.
- Chapters 17 and 18 incorporate village plans, rural settlement plans and environs plans.
- Chapter 19 sets out development management objectives and standards to be applied to future development proposals in the county. The purpose of these standards and objectives is to guide and assist the formulation of development proposals and to regulate the impact of development on the environment.

2.2 Vision Statement

Through the pre-draft public consultation process a number of key themes emerged for consideration regarding the overall vision for the County over the period 2011-2017. These themes have been amalgamated and expressed in the following vision:

"To build on the strengths of the county by facilitating sustainable development, through the provision of high quality employment opportunities and residential developments supported by quality urban and rural environments with physical and social infrastructure to support communities throughout the county."

The vision is intended to act as a 'prompt' for all strategies, policies and objectives of the Plan.

2.3 Relationships with Other Relevant Plans and Programmes

2.3.1 National Development Plan 2007-2013

The National Development Plan 2007-2013 (NDP) is designed to underpin the development of a dynamic competitive economy over the period 2007 - 2013. It envisages a total investment of €184 billion over 7 years to 'secure the further transformation of our country socially and economically within an environmentally sustainable framework'.

2.3.2 National Spatial Strategy 2002-2020

The National Spatial Strategy 2002-2020 (NSS) is a 20-year planning framework for the entire Country to guide policies, programmes and investment. It seeks to promote a better balance of social, economic and physical development between the Regions. With regard to the NSS, the following issues are of particular importance for Kildare:

- Effective integration of land use and transportation;
- Supporting the region's capacity for innovation;
- Facilitating ease of movement of people and goods; and,

- Maintaining a high quality environment.

2.3.3 Sustainable Development: A Strategy for Ireland 1997

This Strategy provides a framework for the achievement of sustainable development at local level and calls on planning authorities to incorporate the principles of sustainability into Development Plans.

2.3.4 Transport 21 & Smarter Travel, A Sustainable Transport Future

Transport 21 is the capital investment framework for the transport system over the period 2006-2015. It comprises of two investment programmes – a National Programme and a Programme for the Greater Dublin Area. County Kildare will benefit from both programmes which aim to increase accessibility, ensure sustainability, expand capacity, increase use of public transport, enhance quality, create a high quality, efficient national road and rail network and to strengthen national, regional and local public transport services. *Smarter Travel, A Sustainable Transport Future* is the new transport policy for Ireland for the period 2009-2020. The policy recognises the vital importance of continued investment in transport to ensure an efficient economy and continued social development, but it also sets out the necessary steps to ensure that people choose more sustainable transport modes such as walking, cycling and public transport.

2.3.5 Regional Planning Guidelines for the Greater Dublin Area

Ireland is divided into eight regional forward planning regions, Dublin, Midlands, Mid East, Mid West, South East, South West, West and Border, each with its own regional planning authority composed of Elected Members selected by the constituent local government councils. Regional planning authorities are required, under the Planning and Development Regulations 2001 to 2009, to draw up Regional Planning Guidelines (RPGs), long term strategic planning frameworks, for their relevant region. RPGs must have regard to the National Spatial Strategy. County Kildare is located within the Greater Dublin Area for which the RPGs for the Greater Dublin Area 2010-2022 have been prepared.

2.3.6 Lower Tier Land Use Plans

Local Area Plans are prepared by the Council for certain settlements and set out in greater detail the Council's requirements for new development, including such factors as density, layout and design requirements, community facilities, transportation, open space and recreational facilities. These plans must be consistent with the County Development Plan. The following local plans were adopted during the course of the County Development Plan 2005-2011: Prosperous, Athgarvan, Allenwood, Kilcullen, Derrinturn, Monasterevin, Sallins, Castledermot, Kilcock, Clane, Leixlip, Collinstown and Celbridge. Development Plans are currently being implemented in the Town Council administrative areas of Naas and Athy.

2.4 Environmental Protection Objectives

The Plan is subject to a number of high level national, international and regional environmental protection policies and objectives, including those which have been developed as Strategic Environmental Objectives (see Section 3.10). Examples of Environmental Protection Objectives include the aim of the EU Habitats Directive - which is to contribute towards ensuring biodiversity through the conservation of natural habitats and of wild fauna and flora in the European territory of Member States - and the purpose of the Water Framework Directive - which is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater which, among other things, prevents deterioration in the status of all water bodies and protects, enhances and restores all waters with the aim of achieving good status by 2015. The Plan must be consistent with these objectives and implement them at County level in Kildare.

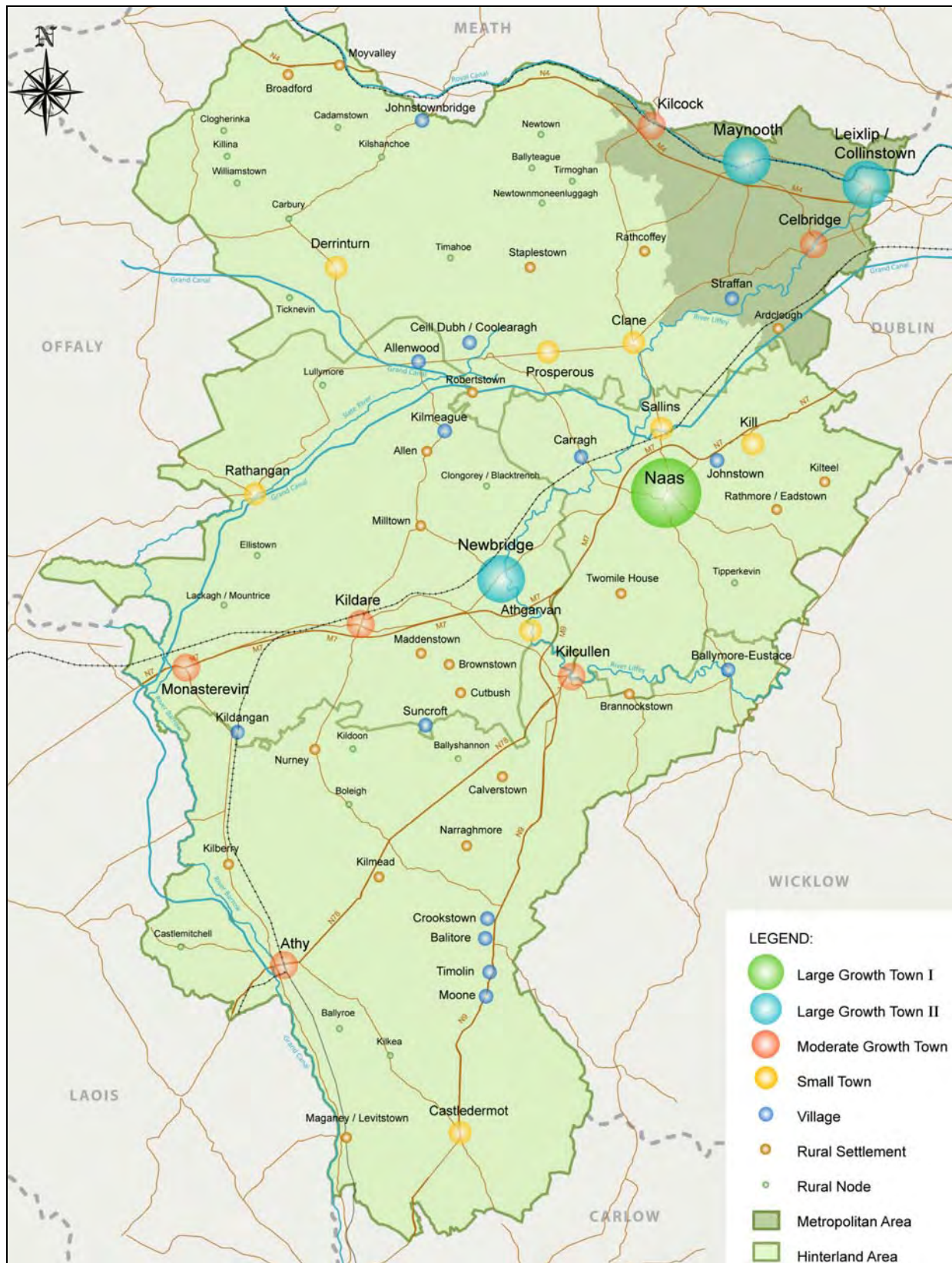


Figure 2.1 Settlement Hierarchy Map from the County Development Plan

Section 3 Existing Environment

3.1 Introduction

The environmental baseline of County Kildare is described in this section. This baseline together with the Strategic Environmental Objectives, which are outlined in Section 4, is used in order to identify, describe and evaluate the likely significant environmental effects of implementing the County Development Plan and in order to determine appropriate monitoring measures.

The environmental baseline is described in line with the legislative requirements encompassing the following components – biodiversity, flora and fauna, population, human health, soil, water, air and climatic factors, material assets, cultural heritage, landscape and the interrelationship between these components. A description is also included of the likely effects upon each environmental component under a do-nothing scenario i.e. the likely evolution of the environment without the implementation of the County Development Plan.

3.2 Biodiversity and Flora and Fauna

3.2.1 Overview of the Habitats

County Kildare supports a wide diversity of natural and semi-natural habitats and a wide range of plant and animal species, some of which have come under threat due to development pressures and increased demand for new development land.

Green space, which makes up a large part of the County, consists of a variety of habitats and corridors which provide for the movement of wildlife. Green space within Kildare is comprised of agricultural lands, bogs and heath, woodlands, grasslands and a number of open spaces in residential areas.

The County 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.

Candidate Special Areas of Conservation, Special Protection Areas, Natural Heritage Areas, proposed Natural Heritage Areas and Nature Reserves in the County are mapped below.

3.2.2 Existing Problems

Changes in land cover indicated by the CORINE data indicate that semi natural areas within the County have been replaced by uses which generally include impermeable surfaces. These changes are also likely to result in losses of biodiversity and flora and fauna.

Aquatic flora and fauna is vulnerable to all forms of pollution. As identified under Section 3.5 in the main Environmental Report, most rivers and some underlying groundwater within and surrounding the County are “at significant risk” or “probably at significant risk” with regard to meeting legislative water quality objectives under the Water Framework Directive.

There are existing problems with regard to surface water quality in the County (see Section 3.5 of main Environmental Report) which are likely to be impacting upon aquatic biodiversity and flora and fauna.

3.2.3 Evolution of Biodiversity and Flora and Fauna in the absence of a Development Plan

In the absence of a Development Plan for County Kildare, development would have no guidance as to where it should occur and planning applications would be assessed on an individual basis with flora and

fauna, habitats and ecological connectivity protected under a number of strategic actions relating to biodiversity and flora and fauna protection. The evolution of biodiversity and flora and fauna would be dependent on the rate and extent of any such developments which would take place.

Any beneficial effects upon biodiversity and flora and fauna which would occur as a result of specific policies and objectives in the Plan would not arise if the Plan was not implemented.

In the absence of a Development Plan, any greenfield development would adversely impact upon biodiversity and flora and fauna by replacing natural or semi natural habitats with artificial surfaces. The significance of such impacts would be dependent on whether such developments would result in the loss of habitats or species of importance as well as the cumulative loss and fragmentation of habitats and species as a result of all greenfield developments.

A Development Plan for the area could contribute to the occurrence of development in an appropriate and sustainable manner. Development along or adjacent to the banks of rivers such as the River Liffey, could result in a reduction in ecological connectivity within and between these and other habitats.

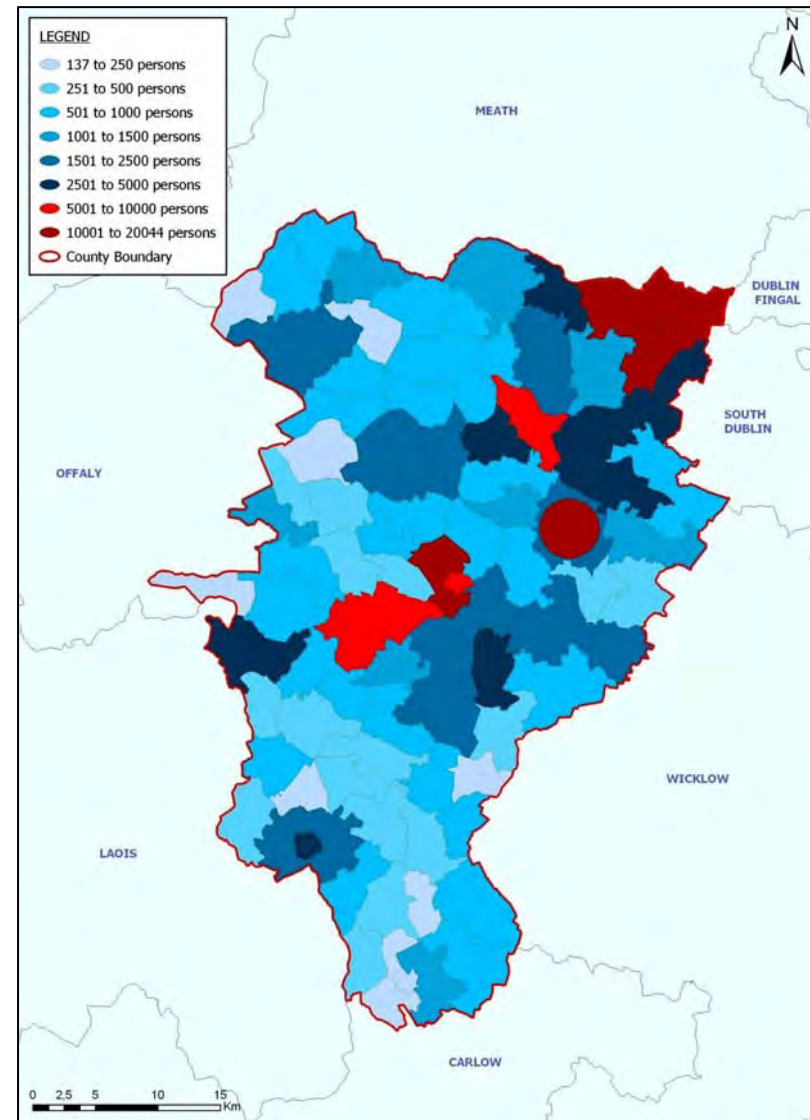
In the absence of a Development Plan there would not be an integration of the ecological protection measures required by the Habitats Directive with the planning or development management of vulnerable areas. Therefore it is likely that there would be less effective protection of ecological resources in the absence of a Development Plan.

The County contains significant areas of industrial peatlands - much of it in semi-state ownership. As the working lives of these areas draws to a close they will be subject to rehabilitation requirements by the operating license conditions. The future of such areas will also be significantly determined by the Habitats Directive which recognises peatlands with a potential to be rehabilitated as priority habitats. Both of these factors may limit the range and type of future uses for such areas.

Pollution of water bodies as a result of any inappropriately sited or managed future developments along rivers would be likely to adversely impact aquatic biodiversity and flora and fauna including salmonid species and other species protected under the Habitats Directive.



cSACs, SPAs, NHAs, pNHAs and Nature Reserves in the County.
 Source: NPWS, 2010 (datasets downloaded January 2010)



Population of County Kildare 2006. Source: CSO (2007)

3.3 Population and Human Health

3.3.1 Population¹

The population of County Kildare has increased from 134,881 in 1996 to 186,335 in 2006 (see map above for most recent population data), representing a growth of 38%. This equates to more than double the national population increase of 17% over the same period. Net migration from abroad and from other counties in Ireland to Kildare accounted for 59.8% of the increase in population.

Significant population growth has occurred within and around the central towns of Naas, Newbridge, Kildare, Clane and Kilcullen, creating a pattern of growth along the M7 and M9 motorways. Significant pockets of population growth also occurred in the north of the County. Populations more than doubled in the rural hinterlands of urban centres like Athy, Naas, Newbridge, Clane and Kilcock and the village of Caragh. While the Athy area experienced significant population increase, the majority of the south of the County experienced lower levels of growth. Areas which experienced population decline over the same period include Leixlip, Rathangan, Ballymore Eustace and Milltown.

Population density varies significantly from concentrations of over 2,000 persons per square kilometre in Newbridge to 0 to 10 persons per square kilometre in a western DED. The urban centres of Naas, Leixlip and Athy experience higher densities compared to more sparsely populated rural areas in the west and south of the county. The urban areas in the northeast of the County have the largest concentration of higher population densities.

3.3.2 Human Health

Human health has the potential to be impacted upon by environmental vectors (i.e. environmental components such as air, water or soil through which contaminants or pollutants, which have the potential to cause harm, can be transported so that they come into contact with human beings). Hazards or nuisances to human health can arise as a result of exposure to these vectors arising from incompatible adjacent land uses for example. These factors have been considered with regard to the description of: the baseline of each environmental component; and the identification and evaluation of the likely significant environmental effects of implementing the Plan and the alternatives.

3.3.3 Existing Problems

Certain environmental vectors within the Plan area - such as air, water or soil - have the potential to transport and deposit contaminants or pollutants, which have the potential to cause harm and adversely impact upon the health of the area's population.

IPPC licensed facilities and Seveso sites could be potential polluters to the Plan area if the facilities do not comply with their licenses.

Although air quality in Kildare meets current standards, there are traffic "hotspots" located along the main road routes especially at intersections in urban areas. These give rise to a harsh sensory environment which may impact upon human health.

3.3.4 Evolution of Population and Human Health in the absence of a Development Plan

In the absence of a Development Plan for the area there would be no framework for the provision of infrastructure to serve existing and future development and this would be likely to delay or hinder the

¹ CSO (various) *Census 2006 Volume 1 - Population Classified by Area; Census 2002 Volume 1 - Population Classified by Area; Census 1996 Volume 1 - Population Classified by Area* Cork: CSO.

provision of infrastructure which would have the potential to result in impacts on environmental vectors to which humans are exposed e.g. a lack of appropriate waste water treatment infrastructure could adversely impact upon drinking water quality and subsequently upon human health.

3.4 Soil

3.4.1 Introduction

Soil is the top layer of the earth's crust. It is formed by mineral particles, organic matter, water, air and living organisms. Soil can be considered as a non-renewable natural resource because it develops over very long timescales. It is an extremely complex, variable and living medium and performs many vital functions including: food and other biomass production, storage, filtration and transformation of many substances including water, carbon, and nitrogen. Soil has a role as a habitat and gene pool, serves as a platform for human activities, landscape and heritage and acts as a provider of raw materials. Such functions of soil are worthy of protection because of their socio-economic as well as environmental importance.

Soils in any area are the result of the interaction of various factors, such as parent material, climate, vegetation and human action.

To date, there is no legislation which is specific to the protection of soil resources. However, there is currently an EU Thematic Strategy on the protection of soil which includes a proposal for a Soil Framework Directive which proposes common principles for protecting soils across the EU.

The soils of the County mainly comprise areas of well and poorly drained deep and shallow mineral soil. Large expanses of Cutaway Peat are evident in the north and west of the County.

3.4.2 Existing Problems relating to Soil

Soil has the potential to be polluted and contaminated as a result of pollution from development which is not serviced by appropriate waste water infrastructure and from agricultural sources. Certain parts of the County are not within the catchment of waste water treatment networks and consequently development in these areas uses septic tanks systems to treat waste water arising - it is likely that local pollution of soil is occurring in certain areas as a result of poorly maintained systems.

Greenfield development involves the building upon and thereby sealing off of soil thus representing an environmental problem.

Soil erosion due mainly to surface erosion resulting from construction works and agricultural/forestry/quarrying/mining operations has major potential to impact on water quality and fishery.

Changes in land cover indicated by the CORINE data indicate that semi natural areas within the County have been replaced by uses which generally include impermeable surfaces. The resultant increase in run-off from precipitation and reduced natural surface area may increase the risk of flood events. These changes are also likely to result in losses of biodiversity and flora and fauna.

3.4.3 Evolution of Soil in the absence of the Development Plan

In the absence of the Development Plan, the evolution of soil would be dependent on developments which take place.

The currently proposed Soil Directive suggests encouraging the rehabilitation of brownfield sites, thus reducing the depletion of greenfield sites. However, in the absence of Plan, there would be no framework for the direction of growth towards brownfield sites, where such direction is appropriate. As a result

greenfield development would be likely to occur on an increased basis and would result in the building upon and thereby sealing off of the non-renewable subsoil and soil resources.

In the absence of Plan, there would be no framework for the provision of infrastructure - such as that relating to waste water treatment - to serve existing and future development and therefore soil would have the potential to be polluted and contaminated as a result of pollution from development which is not serviced by appropriate waste water infrastructure.

3.5 Water

3.5.1 Introduction

Water within and surrounding the County has many functions: it provides drinking water to the area's population; it sustains the biodiversity and flora and fauna described above; it provides amenity; and, it is an integral part of the landscape.

The river and canal networks are important landscape water bodies within the County. The River Liffey runs through the eastern part of the County, reaching as far as Newbridge and running into the Pollaphuca Reservoir at Ballymore Eustace, characterising the north-eastern share of the County. The River Barrow, together with the Black River and the Slate River typify the western County boundary. The Rye Water River – a tributary of the River Liffey - runs along the northern County boundary.

3.5.2 Potential Pressures on Water Quality

Human activities, if not properly managed, can cause deterioration in water quality. Pressures exerted by human activities include the following:

- sewage and other effluents discharged to waters from point sources, e.g. pipes from treatment plants;
- discharges arising from diffuse or dispersed activities on land;
- abstractions from waters; and,
- structural alterations to water bodies.

3.5.3 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 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. All public bodies are required to coordinate their policies and operations so as to maintain the good status of water bodies which are currently unpolluted and improve polluted water bodies to good status by 2015.

3.5.4 River Basin Districts and Water Bodies

For the purpose of implementing the WFD, Ireland has been divided into eight river basin districts or areas of land that are drained by a large river or number of rivers and the adjacent estuarine / coastal areas. The management of water resources will be on these river basin districts.

Within each river basin district - for the purpose of assessment, reporting and management - water has been divided into groundwater, rivers, lakes, estuarine waters and coastal waters which are in turn divided into specific, clearly defined water bodies.

The County is located within the Eastern and South Eastern River Basin Districts. The Local Authorities located in the RBDs have prepared and adopted River Basin Management Plans. 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.

3.5.5 WFD Risk Assessments

In order to achieve the objectives of the WFD it is necessary:

- to assess the risk that water bodies may not achieve good quality status;
- to identify the pressures from human activities causing this risk; and,
- to develop strategies and management plans to minimise the risk.

Risk assessment procedures were developed at national level and applied across all River Basin Districts in order to analyse the impact of the pressures referred to above. The risk assessments were predictive, i.e. they examined each pressure and predicted the magnitude which would be likely to have a negative impact.

Each water body has been assessed, on the basis of human activity, whether it is at risk or not at risk of failing to achieve the WFD's objectives by 2015. The classifications used for reporting this assessment are:

- (1a) At Significant Risk - water body is at risk of failing to meet good status in 2015;
- (1b) Probably at Significant Risk - water body is thought to be at risk of failing to meet good status in 2015 pending further investigation;
- (2a) Probably Not at Significant Risk - the water body is expected to meet good status in 2015; and,
- (2b) Not at Significant Risk - water body is expected to meet good status in 2015, pending further investigation.

Water bodies placed in the (1a) At Significant Risk category will need improvement to achieve the required status while water bodies in the (1b) Probably at Significant Risk category are likely to need improvement in order to achieve the required status.

3.5.6 Surface Water

3.5.6.1 EPA Monitoring

Water quality within the County is monitored by the EPA at a number of locations along rivers. The most recent water quality data² identifies varying Q-values in the County from Bad Status (Q1) to High Status (Q5)³. The results are mapped below.

The River Liffey achieves Good Status (Q4) at many of its monitoring points. The south of the County water quality is of Poor (Q2-3, Q3) or Moderate Status (Q3-4). Bad Status (Q1, Q1-2, Q2) is recorded at five points on the County's rivers including the Tully, Slate and Kilcullen.

The EPA classifies lakes according to their trophic status⁴. The EPA monitored lake water quality at Golden Falls in Ballymore Eustace in 2003 it was classified as being oligotrophic/mesotrophic.

² EPA (various) *Water Quality in Ireland* Wexford: EPA

³ The Biotic Index Values, or Q values, are assigned to rivers in accordance with biological monitoring of surface waters - low Q ratings, as low as Q1, are indicative of low biodiversity and polluted waters, and high Q ratings, as high as Q5, are indicative of high biodiversity and unpolluted waters. Good status as defined by the Water Framework Directive equates to approximately Q4 in the national scheme of biological classification of rivers as set out by the EPA.

⁴ Nutrient enrichment, resulting in eutrophication, is the principal pressure on lake quality in Ireland. Nutrient inputs result in plant growth in lakes whose presence is quantified by a measure of the algal pigment chlorophyll. Lake trophic status, or the extent to which a lake is nutrient enriched, is determined by a consideration of the annual maximum chlorophyll values. Trophic Status ranges from Oligotrophic/Mesotrophic to Moderately Eutrophic to Highly/Strongly Eutrophic to Hypertrophic.

Poulaphouca Reservoir, which is located in County Wicklow, received the same result. Mesotrophic lakes are lakes with an intermediate level of productivity, greater than oligotrophic lakes, but less than eutrophic lakes.

Good status as defined by the Water Framework Directive equates to mesotrophic in the trophic classification of lakes, as set out by the EPA.

3.5.6.2 Risk Assessment

The Liffey, Tully, Barrow, Greese, Lerr and the Slate together with most of their tributaries are almost entirely classified by the Risk Assessments contained in the Characterisation Reports of the Eastern and South Eastern River Basin Districts as being *at significant risk* of failing to achieve the objectives of the Water Framework Directive by 2015.

All remaining rivers and streams in the County, apart from a stretch of the Lemonstown Stream in the east of the County are *probably at significant risk* of failing to achieve the objectives of the Water Framework Directive by 2015.

The only lake in the vicinity of the County which has been classified is Poulaphouca which is *probably at significant risk* of failing to achieve the objectives of the Water Framework Directive by 2015.

These WFD Risk Assessment results are mapped below.

3.5.7 Groundwater

3.5.7.1 Introduction

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 is the part of the subsurface water that is in the saturated zone - the zone below the water table, the uppermost level of saturation in an aquifer at which the pressure is atmospheric, in which all pores and fissures are full of water.

3.5.7.2 Groundwater Quality

The EPA national groundwater-monitoring network includes sampling at some locations that are used for the abstraction of drinking water. Groundwater is monitored at approximately 11 locations throughout the County.

3.5.7.3 Groundwater Protection Schemes

Groundwater Protection Schemes are county-based projects that are undertaken jointly between the GSI and the respective Local Authority.

Groundwater sources, particularly public, group scheme and industrial supplies, are of critical importance in many regions. Consequently, the objective of source protection zones is to provide protection by placing tighter controls on activities within all or part of the zone of contribution (ZOC) of the source.

A Groundwater Protection Scheme has been carried out in County Kildare. The resultant protection zones are shown below.

3.5.7.4 WFD Risk Assessment of Groundwater

The groundwater underlying much of the County is classified as *probably not at significant risk*. An area classified as *not at significant risk* runs along part of the eastern County boundary while an area of groundwater in the north east of the County is *at significant risk*. Areas of groundwater which is *probably at significant risk* exist, mainly along the south western boundary and in the central area of the County.

3.5.7.5 Aquifer Vulnerability

The Geological Survey of Ireland (GSI) rates aquifers according to their vulnerability to pollution. Aquifer vulnerability refers to the ease with which pollutants of various kinds can enter underground water.

Groundwater vulnerability in the County varies considerably from *low* to *extreme*. One large area of *high* vulnerability lies in the centre of the County. Areas of *extreme* vulnerability are mainly along the eastern boundary of the County and to the west of the large area of *high* vulnerability mentioned above. These areas generally contain areas with *rock near the surface or Karst*, the most extreme vulnerability. Groundwater of *low*, *moderate* and *high* vulnerability is dispersed throughout the County.

3.5.7.6 Aquifer Productivity

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, eight of which occur in the County.

The predominant categorisation in the County 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* is 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*.

3.5.8 Register of Protected Areas

In addition to risk assessments, the WFD requires that Registers of Protected Areas (RPAs) are compiled for a number water bodies or part of water bodies which must have extra controls on their quality by virtue of how their waters are used by people and by wildlife.

The WFD requires that these RPAs contain: areas from which waters are taken for public or private water supply schemes; designated shellfish production areas; bathing waters; areas which are affected by high levels of substances most commonly found in fertilizers, animal and human wastes - these areas are considered nutrient sensitive; areas designated for the protection of habitats or species e.g. salmonid areas; Special Areas of Conservation (SACs); and, Special Protection Areas (SPAs). Waters within and surrounding the County which are listed on the RPAs are shown on the map below.

In Ireland, waters intended for human consumption are protected under the Drinking Water Regulations (S.I. 439/2000). The actual protected areas for drinking water are not outlined within these Regulations, so the protected area for drinking waters is represented by the water body from which the water is abstracted, be it groundwater, river or lake. All groundwater underlying the County is listed on the RPA for Drinking Water Groundwater.

The RPA for Water Dependent Habitats includes habitats that are dependent on water: this includes areas already listed by the National Parks and Wildlife Service as Special Areas of Conservation and Special Protection Areas. Rivers on which certain habitats are dependant are also listed on the RPA. The SPAs and SACs identified above are listed on the RPAs for *Water Dependent Habitats (SPA)* and *Water Dependent Habitats (SAC)*.

Nutrient Sensitive waters include nitrate vulnerable zones and areas designated as sensitive areas under the Urban Waste Water Treatment Directive (91/271/EEC). The Barrow and part of the River Liffey are listed on the RPA for Nutrient Sensitive Rivers.

3.5.9 Flooding

3.5.9.1 Introduction

Flooding is an environmental phenomenon which, as well as having caused economic and social impacts, could in certain circumstances pose a risk to human health. County Kildare is vulnerable to adverse effects which are exacerbated by changes in the occurrence of severe rainfall events and associated flooding of the County's rivers.

3.5.9.2 EU Floods Directive

European Directive 2007/60/EC on the assessment and management of flood risks requires Member States to carry out a preliminary assessment by 2011 in order to identify the river basins and associated coastal areas at risk of flooding. For such zones, flood risk maps are required to be drawn up by 2013. Flood risk management plans focused on prevention, protection and preparedness must be established by 2015. The OPW is currently involved in a research project to develop maps with national coverage indicating areas that might be prone to flooding from rivers and streams. Further work is underway to refine the method and outputs, which, if successful, may enable this information to be made available in March/April 2010.

3.5.9.3 DEHLG Flood Risk Management Guidelines & OPW National Mapping

In November 2009 the DEHLG published *The Planning System and Flood Risk Management* Guidelines for Planning Authorities. These are aimed at ensuring a more consistent, rigorous and systematic approach which will fully incorporate flood risk assessment and management into the planning system. Planning authorities are required to undertake flood risk identification, assessment and management processes as appropriate when preparing or varying development plans and local area plans and in consideration of applications for planning permission. The inclusion of Objective WDO 9 in the Draft Plan - to prepare a countywide flood risk assessment and management - strategy is noted.

The locations of the most significant flooding events in the Plan area - accessible from the OPW's National Flood Hazard Mapping website, are mapped below. Flood events are recorded at various locations along the County's rivers. Flood extents are identified at Monasterevin and in the areas around Kildangan, Nurney, Johnstown and Kilberry. There are a number of recurring flood events particularly at Newbridge, Athy, Maynooth and Celbridge. Many flood events were recorded for the years 1954, 1993, 2000 and 2002.

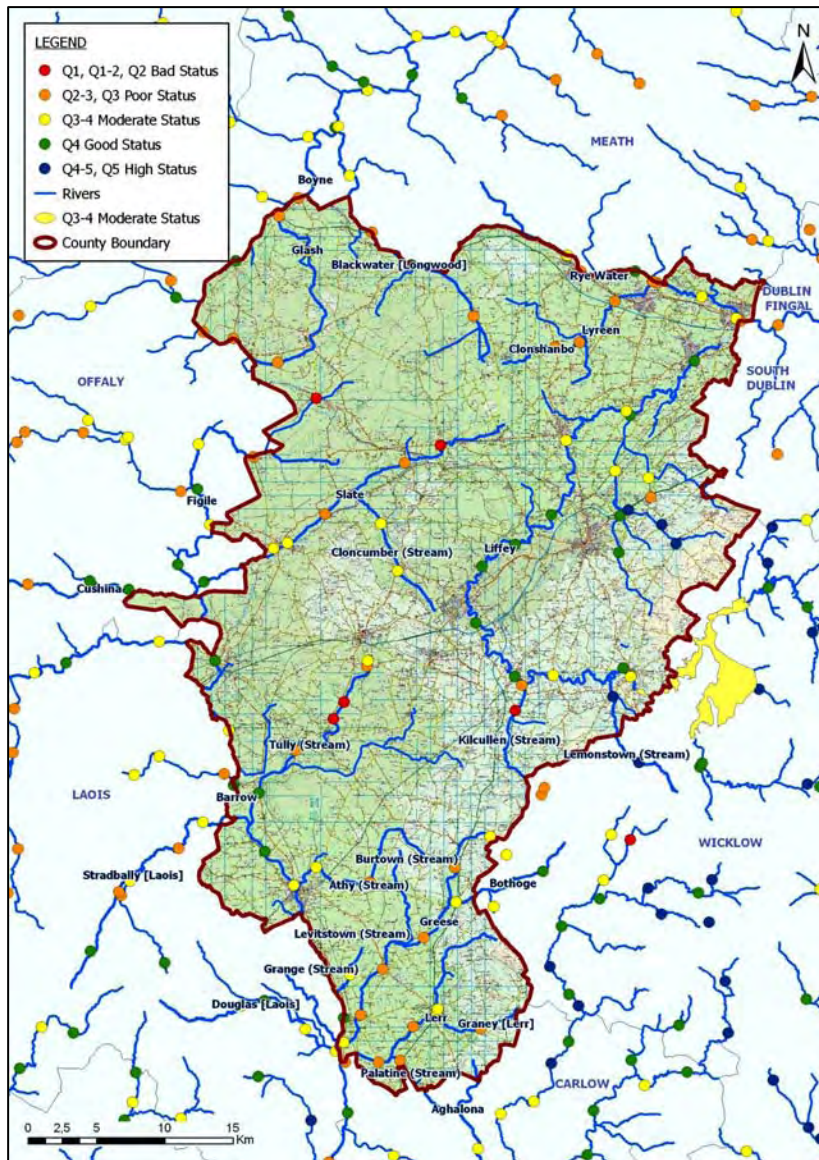
3.5.10 Existing Problems

The above descriptions identify a number of sensitivities with regard to the status of water bodies within the Kildare Plan area. These water quality problems have the potential for significant adverse impact upon human health, drinking water supplies, biodiversity and flora and fauna. Water quality data identifies multiple points on rivers throughout the County as being of Moderate, Poor or Bad Status. The main rivers in the County together with all their tributaries are almost entirely classified by the Risk Assessments contained in the Characterisation Reports of the various River Basin Districts as being either *at significant risk* or *probably at significant risk* of failing to achieve the objectives of the Water Framework Directive by 2015. Flooding has occurred at various locations within the County.

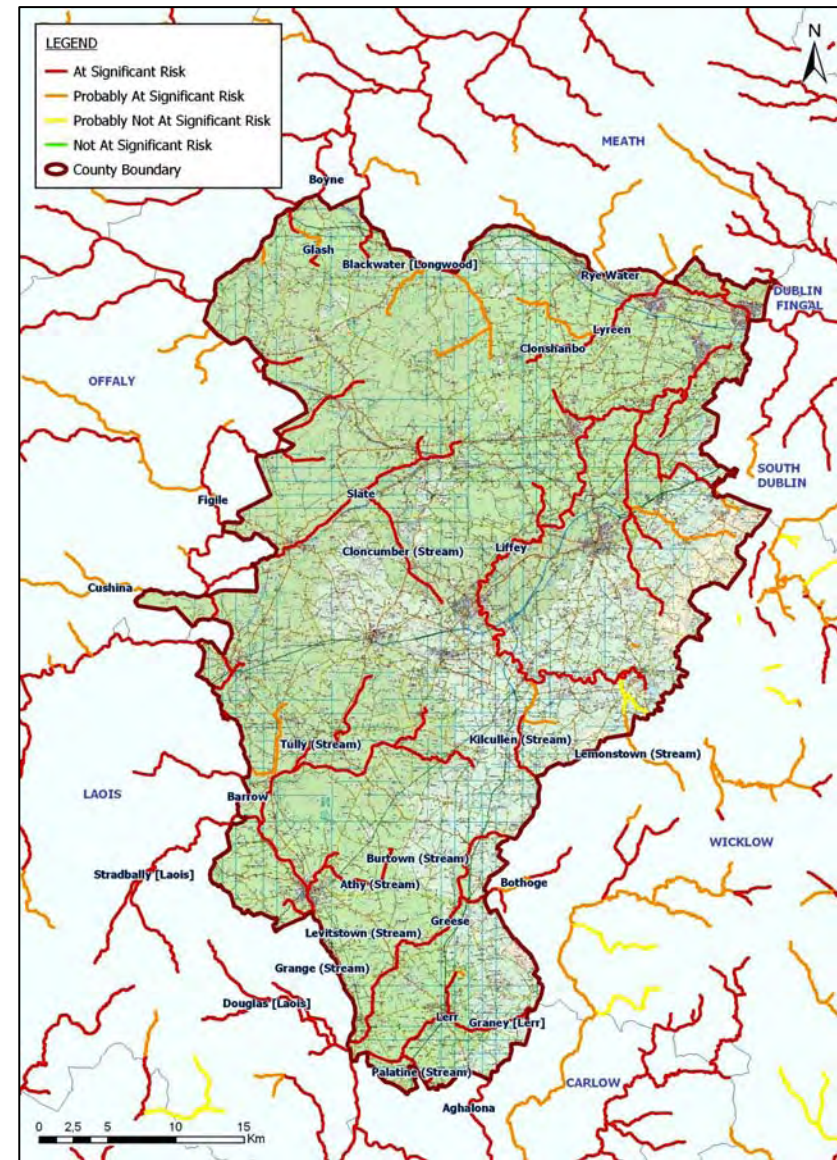
3.5.11 Evolution of Water in the absence of a Development Plan

Based on the current risk assessments, certain surface and ground water bodies are either *at significant risk* or *probably at significant risk* of failing to meet the objectives of the Water Framework Directive by 2015. If growth is not accompanied by appropriate waste water infrastructure/capacity then it is likely that:

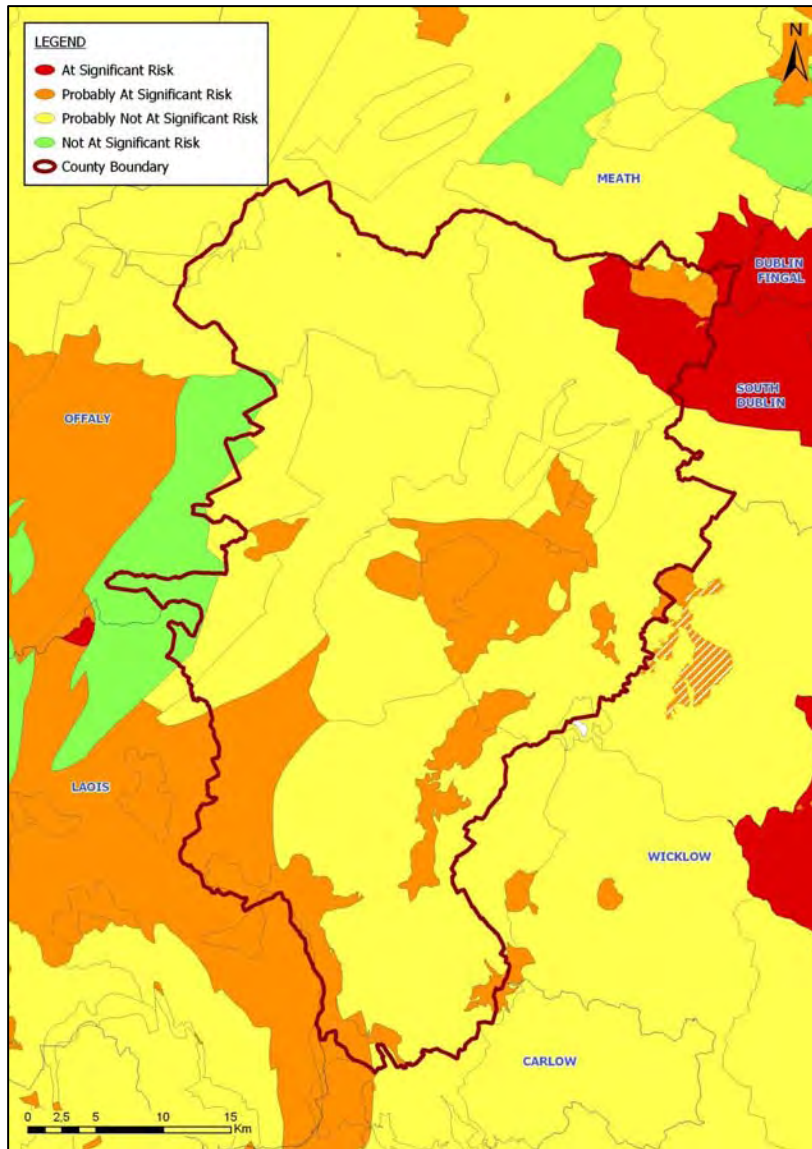
- Certain river and ground water bodies would fail to meet the objectives of the WFD by 2015; and,
- Significant adverse impacts upon the biodiversity and flora and fauna of the County could potentially arise.



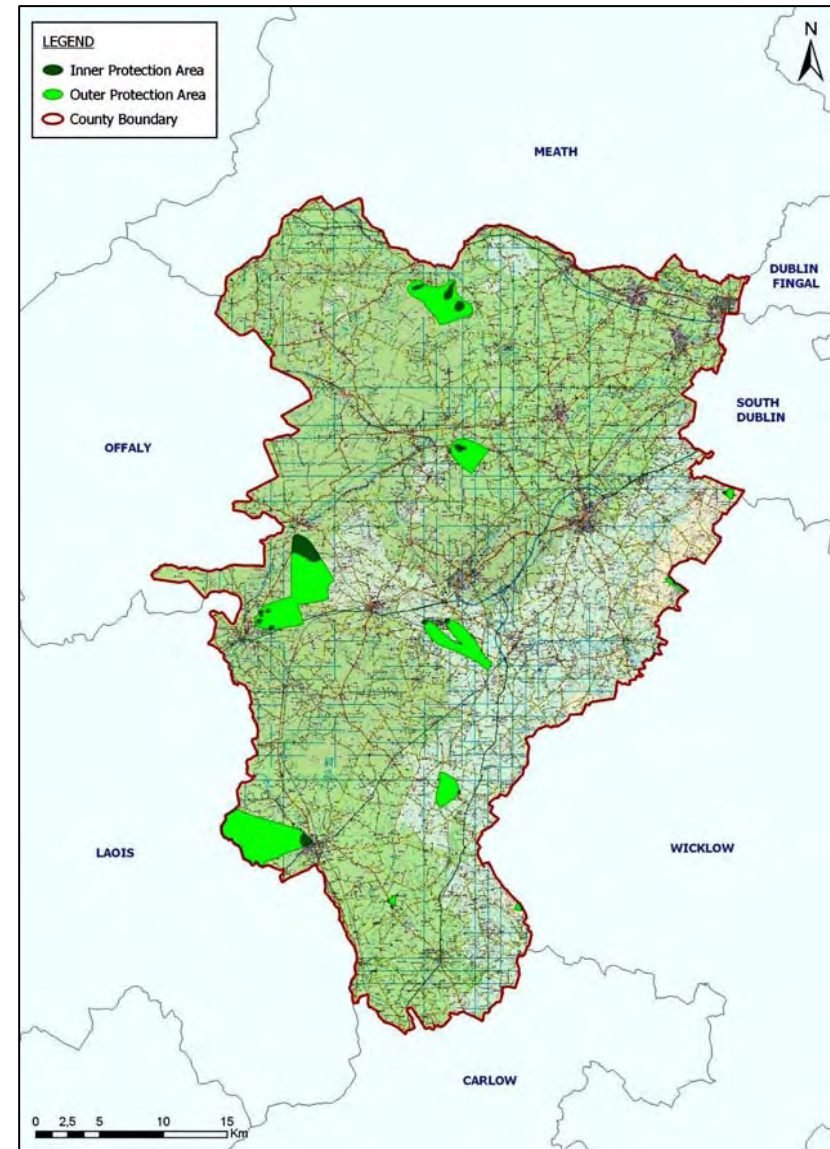
Q-Values (Biotic Index Ratings) at Points on Rivers and Lake Quality. Source: EPA (various)



WFD Risk Assessment of Rivers. Source: EPA (2009)



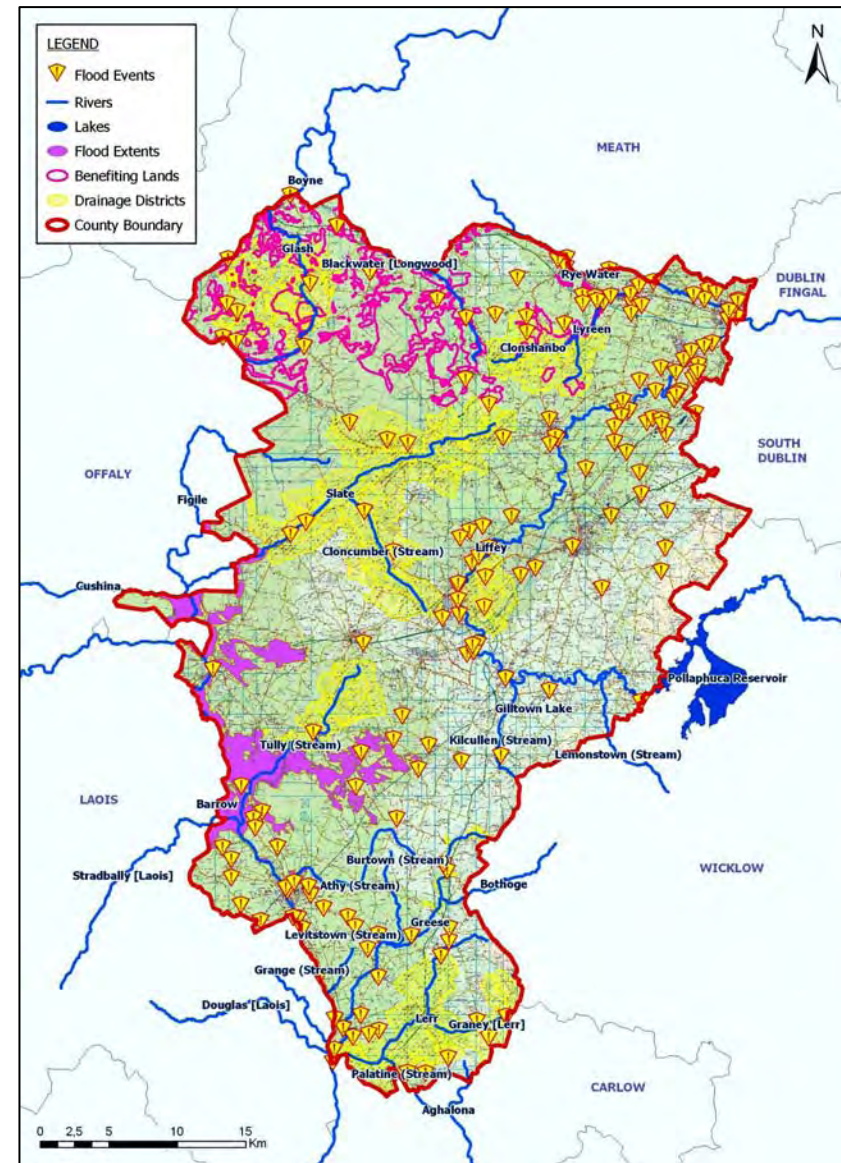
WFD Risk Assessment of Ground Water and Lakes.
Source: EPA (2009)



Ground Water Source Protection Areas. Source: Kildare County Council (2004)



WFD Register of Protected Areas. Source: EPA (2009)



Flood Events & Extents, Benefitting Lands and Drainage Districts in the County. Source: OPW (Various)

3.6 Material Assets

3.6.1 Waste Water

3.6.1.1 Relevant Legislation

The treatment of wastewater is governed by the Urban Waste Water Treatment Directive (91/271/EEC) (amended by Directive 98/15/EEC) transposed into Irish law by the Urban Waste Water Treatment Regulations 2001 (SI 254 of 2001). The Directive aims to protect the environment from the adverse effects of the wastewater discharges by ensuring that wastewater is appropriately treated before it is discharged to the environment. The Regulations stipulate that sewage treatment facilities are in place in all towns by 2005. The treatment of wastewater is also relevant to the Water Framework Directive which requires all public bodies, including Kildare County Council, to coordinate their policies and operations so as to maintain the good status of water bodies which are currently unpolluted and bring polluted water bodies up to good status by 2015.

3.6.1.2 Current Capacity and Demand and Future Upgrades

Relevant available information on waste water infrastructure capacity and demand has been collated for the County and is provided in this section. The information indicates that there is currently spare capacity at Leixlip (22,000 PE⁵), Kildare (2,903 PE), Athy (2,000 PE), Rathangan (2,287 PE) and Monasterevin (6,057 PE). Osberstown is currently operating at capacity. All plants are generally in compliance with the Urban Waste Water Treatment Directive 1991 as amended in 1998.⁶

3.6.2 Drinking Water

3.6.2.1 Drinking Water Quality⁷

Drinking water must be clean and wholesome. That means it must meet the relevant water quality standards and must not contain any other substance or micro-organism in concentrations or numbers that constitute a potential danger to human health.

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. The EPA publishes their results in annual reports which include Remedial Action Lists (RALs). The RAL identifies water supplies which are not in compliance with the Regulations mentioned above. There are no water supplies operated by Kildare County Council which are on the RAL.

3.6.2.2 Current Supply Capacity and Demand and Future Upgrades

Currently in Kildare, excluding the approximate 13MLD demand of Intel, the domestic demand is 63MLD and the non-domestic demand is 13MLD⁸. Kildare County Council is very much dependant on the Greater Dublin Region for its water supply – this will remain the case until it is possible to reduce the percentage dependency on the Region by commissioning the remaining well field schemes and the Barrow Abstraction Scheme and the Kildare Wellfield Development Scheme.

⁵ Population equivalent (in waste-water monitoring and treatment) refers to the amount of oxygen-demanding substances whose oxygen consumption during biodegradation equals the average oxygen demand of the waste water produced by one person.

⁶ Kildare County Council (2009)

⁷ Text in this section is sourced from EPA (2009) *The Provision and Quality of Drinking Water in Ireland: A Report for the Years 2007-2008*, Wexford: EPA

⁸ These are approximate

3.6.3 Waste

A Waste Management Plan for County Kildare has been drawn up in accordance with the 1996 Waste Management Act. The Plan is valid for the period of 2005 - 2010. Section 22 of the Act requires that the Plan be reviewed at least once every five years. The Plan sets out key actions that are to be delivered in each of the Plan's five years.

Waste collected is currently transferred to Dublin from the Integrated Waste Management Facility at Silliot Hill, Kilcullen for baling prior to disposal at Arthurstown Landfill Site.

3.6.4 Vehicular Circulation

County Kildare is well served in terms of vehicular access. Close proximity and good connections to Dublin Airport present a convenient entry point for international business connections. Transport routes are mapped below.

3.6.5 Existing Problems

Certain regions of the Plan area are not within the catchment of the waste water treatment network and consequently development in these areas use septic tanks to treat waste water arising.

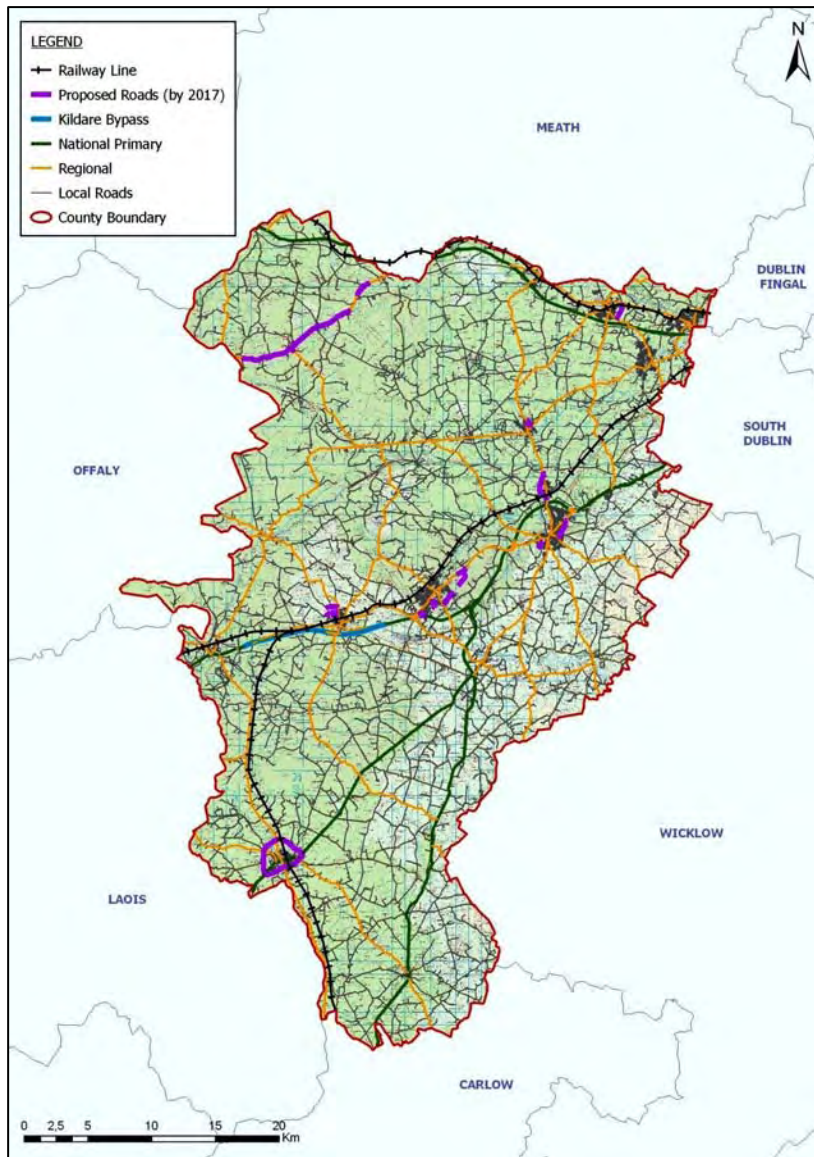
Certain parts of the County are not within the catchment of the waste water treatment network and consequently development in these areas use septic tanks to treat waste water arising.

There are no problems foreseen in terms of waste capacity for the Plan area.

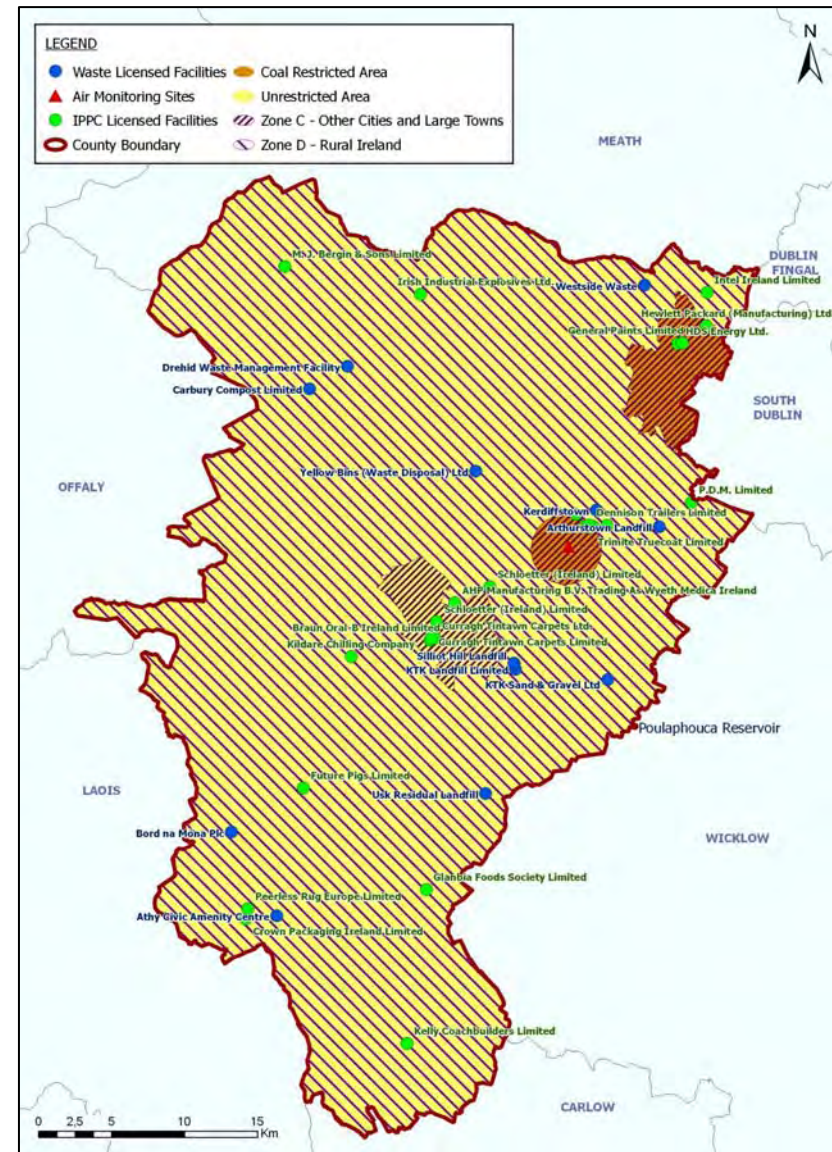
3.6.6 Evolution of Material Assets in the absence of a Development Plan

In the absence of a Development Plan, it is likely that dispersed development would occur. This would make it more difficult to provide the necessary infrastructure such as waste water treatment plants and networks, water supply infrastructure, transport infrastructure and powerlines etc.

Failure to provide sufficient infrastructure for development would be likely to result in significant adverse impacts. For example, failure to upgrade and provide new waste water infrastructure would be likely to adversely impact upon water quality and indirectly significantly adversely impact upon biodiversity and flora and fauna, drinking water supplies and human health.



Road and Rail Network and the proposed N4 and N5 Routes.
 Source: Kildare County Council (Various)



Location of IPPC & Waste Licensed Facilities, Air Quality Monitoring Sites. Source: EPA (2009)

3.7 Air and Climatic Factors

3.7.1 Ambient 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 principles to this European approach are set out under the Air Quality Framework Directive 1996 as transposed into Irish law under the Environmental Protection Agency Act 1992 (Ambient Air Quality Assessment and Management) Regulations 1999 (SI No. 33 of 1999).

Four daughter Directives lay down limits or thresholds for specific pollutants. The first two of these directives cover: sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead; and, carbon monoxide and benzene. Two more daughter directives deal with: ozone; and polyaromatic hydrocarbons, arsenic, nickel, cadmium and mercury in ambient air.

In order to comply with these directives, the EPA measures the levels of a number of atmospheric pollutants. For the purposes of monitoring in Ireland, four zones are defined in the Air Quality Standards Regulations 2002 (SI No. 271 of 2002). The main areas defined in each zone are:

- Zone A: Dublin Conurbation.
- Zone B: Cork Conurbation.
- Zone C: 21 Other cities and large towns comprising Galway, Limerick, Waterford, Clonmel, Kilkenny, Sligo, Drogheda, Wexford, Athlone⁹, Ennis, the Midland Region, Naas, Carlow, Tralee and Dundalk.
- Zone D: Rural Ireland, i.e. the remainder of the State - small towns and rural areas of the country - excluding Zones A, B and C.

County Kildare is mostly in Zone D apart from the areas of Celbridge, Naas and Newbridge which are designated as Zone C. These zones are mapped above.

Air quality monitoring commenced at the Kildare County Council offices at Newbridge in October 2009. Air Quality was monitored on the Sallins Road in Naas at the location shown above from October 2003 to April 2004.

3.7.2 Potential Point Sources of Emissions to Air

3.7.2.1 IPPC Licensed Facilities

The EPA has been licensing certain large-scale industrial and agriculture activities since 1994. Originally the licensing system was known as Integrated Pollution Control (IPC) licensing, governed by the Environmental Protection Agency Act, 1992. The Act was amended in 2003 by the Protection of the Environment Act, 2003 which gave effect to the Integrated Pollution Prevention Control (IPPC) Directive. Detailed procedures concerning the IPPC licensing process are set out in the EPA Acts 1992 to 2007 and the associated licensing regulations.

IPPC licences aim to prevent or reduce emissions to air, water and land, reduce waste and use energy/resources efficiently. An IPPC license is a single integrated license which covers all emissions from the facility and its environmental management. All related operations that the license holder carries in

⁹ The administrative area of Athlone Town Council and the Environs to the east of the Town are included in Zone C.

connection with the activity are controlled by this license. Before a license is granted, the EPA must be satisfied that emissions from the activity do not cause a significant adverse environmental impact.

There are approximately 20 IPPC licensed facilities distributed throughout the County. These are mapped above.

3.7.2.2 Waste Licensed Facilities

In 1996 the EPA began licensing certain activities in the waste sector. These include landfills, transfer stations, hazardous waste disposal and other significant waste disposal and recovery activities.

A waste license is a single integrated license dealing with emissions to all environmental media and the environmental management of the facility. All related waste operations connected to the activity are considered in determining a license application. The EPA must be satisfied that the activity will not cause environmental pollution when carried on in accordance with the license conditions. Detailed procedures on processing waste license applications are set out in the Waste Management Act, 1996 which was amended by the Protection of the Environment Act, 2003 and associated regulations.

There are 11 waste licensed facilities distributed throughout the County. These are shown on the above map.

3.7.3 Noise

A Noise Action Plan has been prepared by Kildare County Council in accordance with the requirements of the Environmental Noise Regulations 2006, Statutory Instrument 140 of 2006. These Regulations give effect to the EU Directive 2002/49/EC relating to the assessment and management of environmental noise.

Strategic noise mapping was undertaken in 2007 by the National Roads Authority for the following major roads:

- M4 between the boundary with South Dublin County Council at Leixlip and the boundary with Meath County Council at Ballynakill and between the boundary with Meath County Council at Martinstown and the boundary with Meath County Council at Clonard;
- N7/M7 between the boundary with South Dublin County Council at Castlewarden and the boundary with Laois County Council at Jamestown;
- M9 between its junction with the M7 at Hillsborough and the Kilcullen Interchange; and
- N9 between Moone and Crookstown, County Kildare.

The results of this assessment have been presented as maps and summary tables of statistics showing the estimated area, number of dwellings and people exposed to long term road traffic noise within the area covered by the noise maps. The results are mapped as a series of coloured 5 dB(A) wide noise level bands above 55 dB L_{den}^{10} and 50 dB L_{night}^{11} .

3.7.4 Climatic Factors

3.7.4.1 Climate Change

Climate change refers to any change in climate over time, whether due to natural variability or as a result of human activity. The release of greenhouse gases into the atmosphere as a result of human activities adds to natural climate variability by increasing the naturally occurring greenhouse effect. This greenhouse effect occurs in the atmosphere and is caused by greenhouse gases which exist naturally in the atmosphere. The greenhouse gases retain the radiation which is released from the earth as a result of heating by the sun. This retention maintains a global temperature which is suitable for ecosystems and life.

¹⁰ L_{den} is the 24 hour noise rating level determined by the averaging of the L_{day} , with the $L_{evening}$ plus a 5 dB penalty, and the L_{night} plus a 10 dB penalty

¹¹ L_{night} is the A-weighted long-term average sound level between 23.00 and 07.00

Climate change is not limited to changes in temperatures or weather - it can also mean changes in the occurrence of extreme and unstable weather conditions, storms and floods, droughts and coastal erosion.

3.7.5 Existing Problems

Traffic hotspots within the County area are likely to have elevated levels of air pollution and noise due to traffic congestion.

Localised air pollution incidences with regard to PM10 and PM2.5 and noise pollution are both likely to occur when demolition/construction takes place - especially in relation to PM10 if suppression techniques are not introduced - and when traffic is queuing for long periods of time.

Ireland's current emissions are exceeding targets agreed in the peer review of Ireland's 2006 submission to the United Nations Framework Convention on Climate Change. It is unlikely that Ireland will meet these targets and it is likely therefore that financial penalties will be incurred. Transport related emissions continue to be the dominant growth sector.

Changes in sea level and/or changes in the occurrence of severe rainfall events as a result of climate change could adversely impact upon the area's human beings, its biodiversity and its economy.

3.7.6 Evolution of Air and Climatic Factors in the absence of a Development Plan

Increases in the use of catalytic converters, cleaner fuels, better engine technology and maintenance is generally reducing the pollution omitted per motor vehicle, however, this reduction is probably being offset by the increase in the number of cars as well as the increase in the volume and incidences of traffic congestion. Increases in the number of cars as well as the increase in the volume and incidences of traffic congestion may lead to increases in air and noise pollution in the future.

If new dispersed development occurs in the County, adverse impacts upon air quality and noise levels, and resultant impacts upon human health, would be likely to arise if unmitigated.

In the absence of the Plan, the realisation of objectives relating to energy efficiency, renewable energy and a reduction in local transport related emissions to air contained within the Plan would be dependent upon the objectives contained in lower tier development and local area plans - which are required to provide for proper planning and sustainable development.

The Plan inter alia provide an opportunity to provide for the regeneration of certain urban and inner suburban areas within the County which are close to existing and proposed high quality public transport linkages. This regeneration would provide for an increased population which would be less dependent upon private modes for local transportation and would therefore be likely to generate less local transport related greenhouse gas emissions than populations located further away from the urban areas. In the absence of the Plan regeneration of the urban areas across the County would be less likely to be achieved as population would be more likely to gravitate towards the east of the County which is in closest proximity to and better connected to the Greater Dublin Area. Such gravitation would produce less additional national and interregional vehicular movement by private and goods vehicles and such increases would be more likely to use capacity in existing and emerging installed infrastructure capacity. It is noted however that the gravitation of new populations to the east would be dependent upon the nature of lower tier development plans which are required to include objectives for the development and renewal of areas in need of regeneration.

3.8 Cultural Heritage

3.8.1 Introduction

Heritage, by definition, means inherited properties, inherited characteristics and anything transmitted by past ages and ancestors. It covers everything, from objects and buildings to the environment. Cultural heritage includes physical buildings, structures and objects, complete or in part, which have been left on the landscape by previous and indeed current generations.

Human interaction with the land is evident from the earliest of times up to the present in the County, from agricultural landscapes to archaeological remains to growing urban centres.

Kildare is one of the oldest towns in Ireland. It originated in pre-Christian times when it was the site of a shrine to the Celtic Goddess Brigid. Today it contains many historic buildings and ruins; the legacy of 1500 years of history.

3.8.1.1 Record of Monuments and Places

The County's archaeological heritage is protected under the National Monuments Acts (1930-2004), Natural Cultural Institutions Act 1997 and the Planning Acts. The Record of Monuments and Places (RMP) is an inventory, put on a statutory basis by amendment to the National Monuments Act 1994, of sites and areas of archaeological significance, numbered and mapped.

The term 'monument' includes all man-made structures of whatever form or date except buildings habitually used for ecclesiastical purposes. All monuments in existence before 1700 A.D. are automatically considered to be historic monuments within the meaning of the Acts.

There are a large number of recorded monuments in the County. Spatial distribution of monuments listed on the RMP is mapped below. Entries include Enclosures, Habitation Sites and Castles.

3.8.1.2 National Inventory of Architectural Heritage

The National Inventory of Architectural Heritage (NIAH) is a state initiative under the administration of the Department of the Environment, Heritage and Local Government 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 the Environment, Heritage and Local Government to the planning authorities for the inclusion of particular structures in their Record of Protected Structures (RPS).

Structures listed on the NIAH occur in clusters in the main settlements in the County including Athy, Kilcock, Maynooth, Monasterevin, Kildare, Naas and Rathangan.

3.8.1.3 Architectural Conservation Areas

The Planning and Development Act, 2000 provides the legislative basis for the protection of such areas, known as Architectural Conservation Areas (ACAs). An ACA is a place, area or group of structures or townscape which is of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest or value, or contributes to the appreciation of protected structures, whose character it is an objective to preserve in a development plan. The ACA designation requires that planning permission must be obtained before significant works can be carried out to the exterior of a structure in the ACA which might alter the character of the structure or the ACA.

ACAs enable the protection of the existing character of areas within the settlements listed above throughout the County. This character is a combination of the various layers of development from earliest

times to the present. Though often not individually very important, vernacular buildings contribute to the acknowledged distinctive character of many of the County's built up areas. Collectively, if properly used and maintained, they can make a significant impact on the retention and enhancement of that character which is important in maintaining local distinctiveness for both inhabitants and visitors.

Boundaries for Architectural Conservation Areas have been defined for Kilcock, Monasterevin, Prosperous, Rathangan, Maynooth, Moone, Leixlip and Ballitore. An ACA exists in Naas.

3.8.2 Existing Environmental Problems

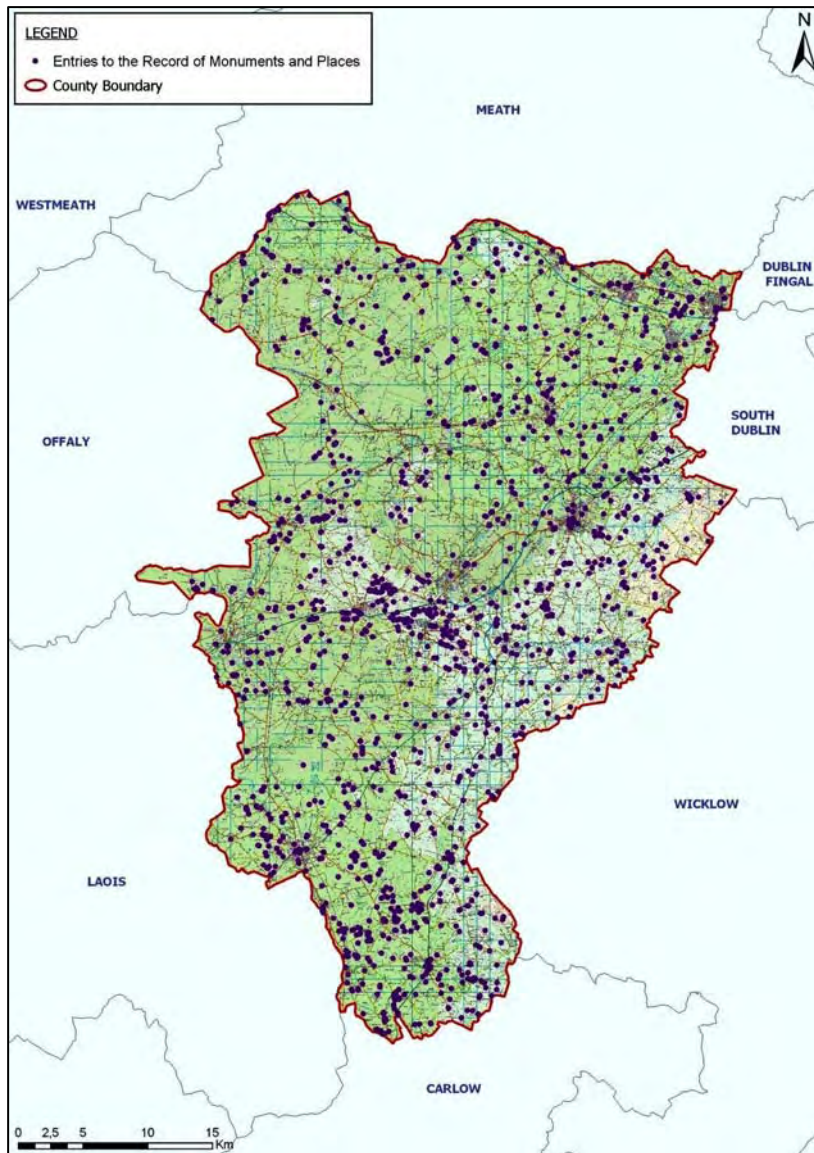
Threats to cultural heritage include the cumulative accommodation of large scale development in the County, development which involves material alteration or additions to protected structures, brownfield development and development on sites adjoining protected monuments, places or structures.

3.8.3 Evolution of Cultural Heritage in the absence of a Development Plan

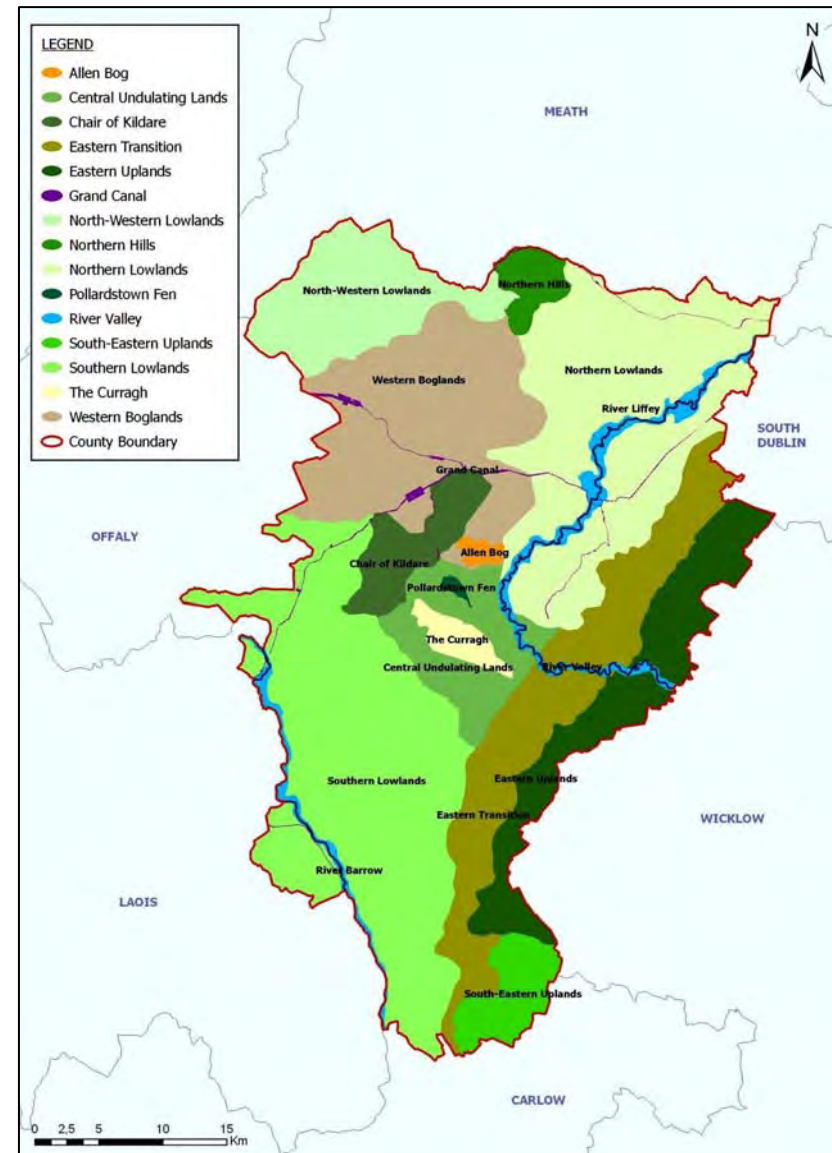
In the absence of the Plan, the evolution of cultural heritage would be dependent on developments which take place.

Such development would have no guidance as to where to be directed and planning applications would be assessed on an individual basis with cultural heritage protected under a number of strategic actions relating to archaeological and architectural protection.

Beneficial impacts upon the protection of cultural heritage which would be likely to arise as a result of the Plan provisions would not necessarily occur.



Entries to the Record of Monuments and Places.
 Source: Kildare County Council (Various)



Landscape Character Areas. Source: CAAS (2003)

3.9 Landscape

3.9.1 Introduction

Landscapes are areas which are perceived by people and are made up of a number of layers:

- landform, which results from geological and geomorphological history;
- land cover, which includes vegetation, water, human settlements;
- human values which are a result of historical, cultural, religious and other understandings and interactions with landform and land cover.

The topography of the County consists of a large, fertile plain broken only by a few small hills such as Dunmurray Hill and the Hill of Allen, with upland areas mainly on the eastern boundary with County Wicklow. The fertile plain forms part of the central lowlands of Ireland and extends throughout most of the County including the unique landscape of the Curragh. Significant areas of bogland are located to the north west of the County. The uplands to the east separate the plains from the Wicklow Mountains and Blessington.

The Royal and Grand Canal as well as the many rivers flowing throughout the County are important landscape features as is Curragh, which represents the largest unenclosed area of arable land of the Country (5,000 acres).

3.9.2 Landscape Character Assessment

A Landscape Character Assessment was prepared for the County by CAAS in 2003 in accordance with the DEHLG's Draft Landscape and Landscape Assessment Guidelines (2000). It classifies the different landscapes of the County in relation to their different characteristics and values and their degree of sensitivity to various kinds of development. The upland areas include the mountainous areas to the east of the County as well as the Chair of Kildare and the hills to the north; the lowland areas examine the low-lying agricultural lands and the urban area environs of Naas, the river valleys refer to the environs of the two major rivers that run through the County (i.e. Rivers Barrow and Liffey), whilst the water corridor areas refer to the landscape areas along the Grand Canal and the Royal Canal. Transition areas refer to the zone between the upland and lowlands areas. These Landscape Character Areas are mapped above.

3.9.3 Scenic Views and Routes

The County contains many sites, areas and vantage points from which views over areas of great natural beauty, local landmarks, historic landscapes and adjoining Counties may be obtained. In addition to scenic views, the County also contains important prospects i.e. prominent landscapes or areas of amenity value or special interest which are visible from the surrounding area.

The Scenic Views and Scenic Routes as listed in the current Kildare County Development Plan 2005-2011 includes views and prospects to and from:

- Water Corridors,
- Canals,
- County Waterways,
- Hills, and;
- Scenic Routes.

3.9.4 Existing Landscape Problems

Generalised landscape problems include the cumulative visual impact resulting from developments such as one off houses. Such developments, which individually often do not have significant adverse impacts, have the potential to cumulatively and adversely significantly impact upon sensitive landscapes.

3.9.5 Evolution of Landscape in the absence of the Development Plan

In the absence of a Development Plan, development would be likely to occur on a one-off, dispersed basis. As outlined above, this could have cumulative impacts on the landscape. However, Development Management would continue to safe the landscape resources that have been highlighted above.

3.10 Strategic Environmental Objectives

Based on an understanding of the existing environment a number of Strategic Environmental Objectives (SEOs) were developed in order to facilitate the evaluation of the Plan and its alternatives and Plan provisions. SEOs are distinct from the objectives of the Plan - although they will often overlap - and are developed from international, national and regional policies which generally govern environmental protection objectives. Such policies include those of various European Directives which have been transposed into Irish law, all of which are intended to be implemented at county level in Kildare and integrated into any plan for the County. The SEOs which were used in the assessment are identified on the table below.

SEO Code	SEO
B1	To ensure compliance with the Habitats Directive with regard to the protection of Natura 2000 Sites and habitats and species listed under Annexes I and II of the Directive
B2	To ensure compliance with Article 10 of the Habitats Directive protection of macro-corridors, stepping stones and contiguous areas of habitat which are important on a County level for wild fauna and flora and essential for the migration, dispersal and genetic exchange of wild species
B3	To sustain existing sustainable rural management practices - and the communities who support them - to ensure the continuation of long established managed landscapes and the flora and fauna that they contain
HH1	To protect human health from hazards or nuisances arising from exposure to incompatible landuses
S1	To prevent pollution and/or contamination of soil
W1	To maintain and improve, where possible, the status of surface waters
W2	To prevent pollution and contamination of ground water
W3	To manage areas that are currently at risk of flooding or are likely to pose a significant flood risk in the future in compliance with The Planning System and Flood Risk Management Guidelines for Planning Authorities and Floods Directive ultimately
M1	To serve new development with adequate and appropriate waste water treatment
M2	To serve users of public water supplies with drinking water that is both wholesome and clean
C1	To reduce travel related greenhouse emissions to air
C2	To encourage modal change from car to more sustainable forms of transport
CH1	To protect the archaeological heritage of the County including entries to the Record of Monuments and Places and/or their context
CH2	To preserve and protect the special interest and character of the County's architectural heritage
L1	To avoid significant adverse impacts on the landscape, especially with regard to sensitive landscapes and protected views and scenic routes

Section 4 Alternative Plan Scenarios

4.1 Description of the Alternative Plan Scenarios

One of the critical roles of the SEA is to facilitate an evaluation of the likely environmental consequences of a range of alternative strategies for accommodating future development in County Kildare. The environmental consequences of 3 scenarios for the Plan were examined.

4.1.1 Alternative Scenario 1: *Dispersed Development Strategy*

The Dispersed Development Strategy (see Figure 4.1) is based on a laissez-faire approach to development, with rural dispersal and limited urban growth. The location and nature of development is completely dependent on market demand, with little consideration of strategic planning or environmental protection. The following are the key elements of this development strategy:

- No adherence to a settlement strategy based on RPGs, Town Plans, LAPs, etc.;
- No creation of critical mass at strategic locations within the County;
- Significant levels of suburbanisation around Leixlip, Maynooth, Celbridge, Kilcock, Naas, Newbridge and other commuter towns;
- Extensive low density greenfield development;
- Uncontrolled development of existing rural settlements and rural housing, particularly in the south of the County;
- Dispersed development in the rural settlements and rural countryside; and,
- Natural Resource enterprises (extractive industries, forestry and wind energy) are developed in an individual basis through out the County.

4.1.2 Alternative Scenario 2: *Structured Development Strategy*

The Structured Development Strategy (see Figure 4.2) follows a strong yet flexible approach to development, based on a well-developed urban structure supported by diverse rural areas. The following are the key elements of this development strategy:

- Emphasis is based on building critical mass in the Metropolitan area (Maynooth, Leixlip, Celbridge, Kilcock) and at key towns and villages along strategic development corridors (Naas, Newbridge, Athy, Kildare, Monasterevin, Kilcullen);
- Emphasis is based on improving public and private transport and other service infrastructure along these strategic development corridors;
- Continued support of the rural area through a sustainable, flexible approach to maintaining the rural economy and population, balanced against responsible environmental protection;
- Reasonable containment of development in the rural areas around the Metropolitan area and at key towns;
- Growth is distributed across the County Settlement structure generally following an adopted settlement strategy and is highly dispersed;
- The metropolitan area and key towns contain the majority of the population growth, infrastructure and enterprise.

4.1.3 Alternative Scenario 3: *Growth in the Metropolitan Area Strategy*

The Growth in the Metropolitan Area Strategy (see Figure 4.3) is based on focusing the vast majority of development in the Metropolitan area, with limited growth dispersed throughout the rest of the County.

The following are the key elements of this development strategy:

- Emphasis is based on focusing the vast majority of development in the Metropolitan Area (Maynooth, Leixlip, Celbridge, Kilcock). Upgrade transport and other service infrastructure within this area. Quality of life is the priority;
- Natural growth levels for the key towns (Naas, Newbridge, Athy, Kildare, Monasterevin, Kilcullen) with strict control of development in their hinterlands;
- A hierarchy of rural settlements with limited and controlled growth in higher order settlements and no growth in the remaining settlements;
- Strict control of development in the rural areas outside of the Metropolitan area and the key towns;
- A strong environmental protection policy would be implemented with the identification of various environmental zones within the County; and,
- Natural Resource enterprises (Extractive industries, Forestry, wind energy) are developed in a controlled manner through out the County.

4.1.4 Alternative Scenario 4: *Centred Development Strategy*

The Centred Development Strategy (see Figure 4.4) is based on building strong urban centres and protecting the rural hinterlands. The focus is on achieving critical mass in the Metropolitan Area and at key towns and villages. The following are the key elements of this development strategy:

- Emphasis on achieving critical mass in the Metropolitan Area (Maynooth, Leixlip, Celbridge, Kilcock) through the strategic development of this area of the County;
- Further growth in key towns along strategic development corridors (Naas, Newbridge, Athy, Kildare, Monasterevin, Kilcullen). These settlements will act as focal points for their rural catchments;
- Strict control of development outside of the Metropolitan area and the key towns;
- A strong environmental protection policy would be implemented with the identification of various environmental zones within the County;
- Growth is distributed across the county following an adopted settlement strategy that reflects the RPGs for the Greater Dublin Area;
- Specific areas are designated for natural resource enterprise such as forestry, mineral extraction and wind farms (where viable);
- The south of the county supports rural enterprise based employment with the strengthening of villages and towns as well as some higher-level rural settlements;
- Quality of life is the priority in strong towns and villages; and,
- Rural settlements are planned and set out in a hierarchy in order to evolve into centres capable of providing a range of services and employment to their local population.

Figure 4.1 Scenario 1: *Dispersed Development Strategy*

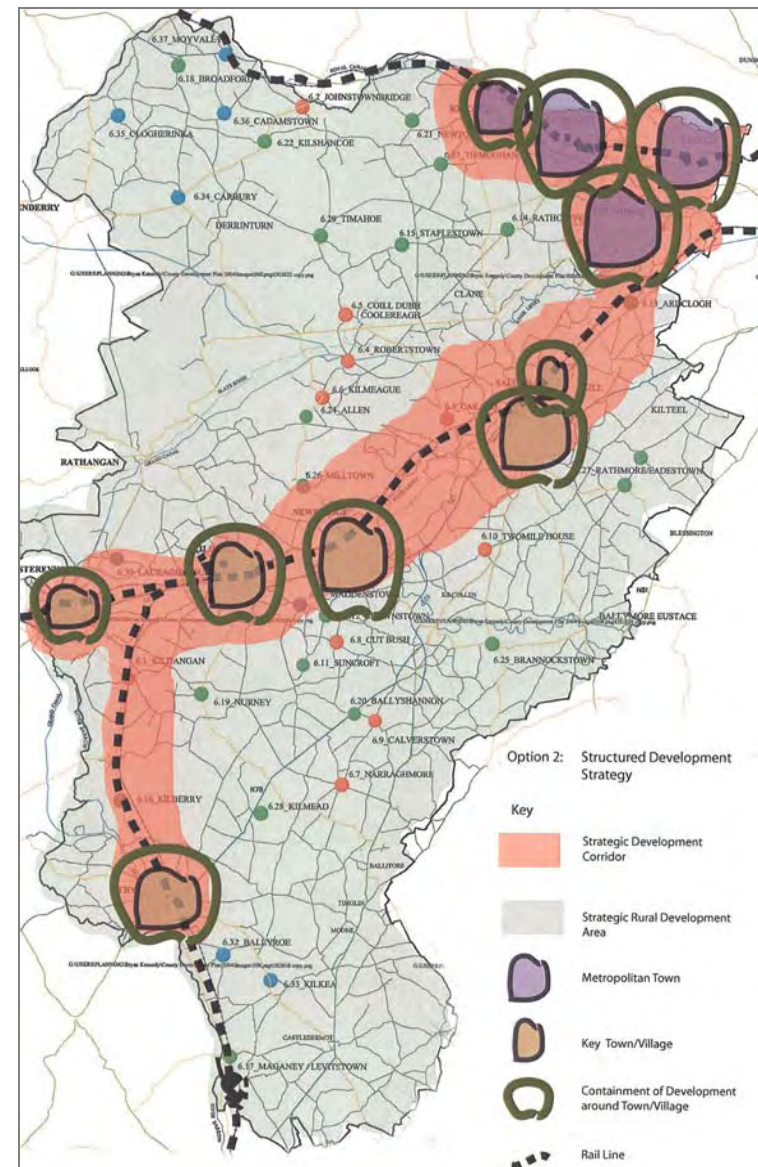
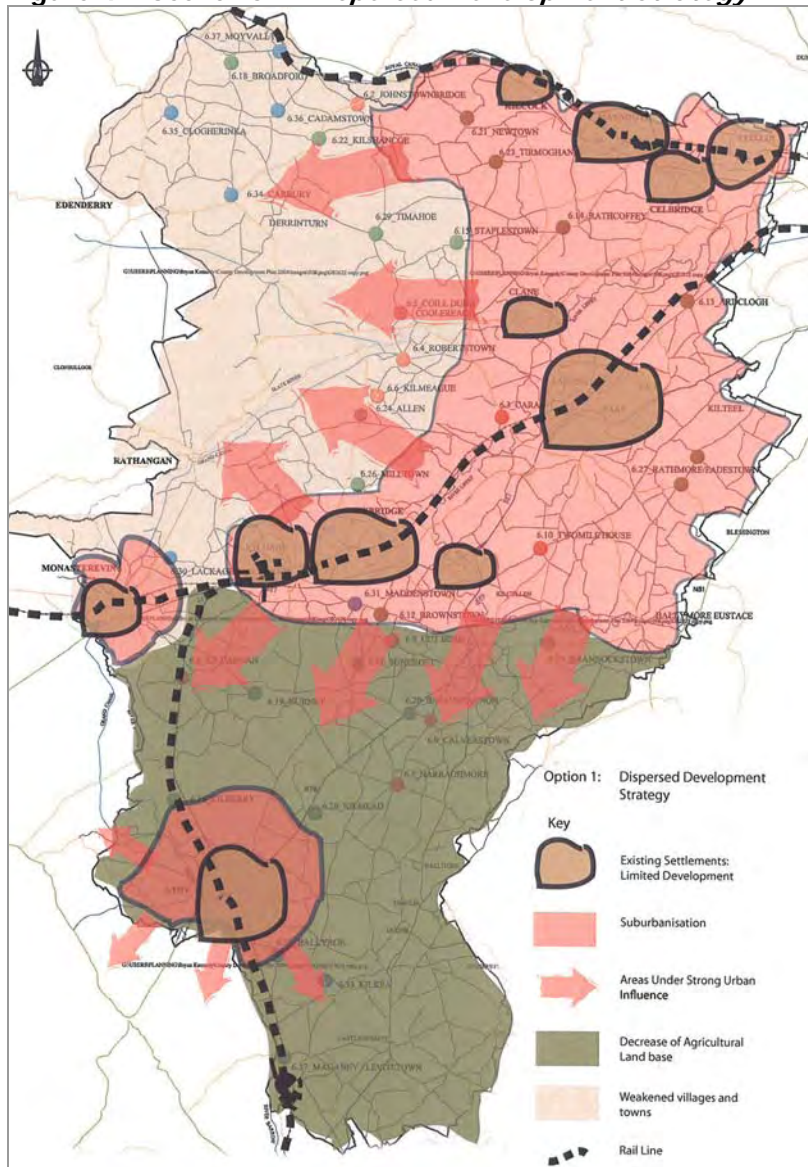


Figure 4.2 Scenario 2: *Structured Development Strategy*

Figure 4.3 Scenario 3: *Growth in the Metropolitan Area Strategy*

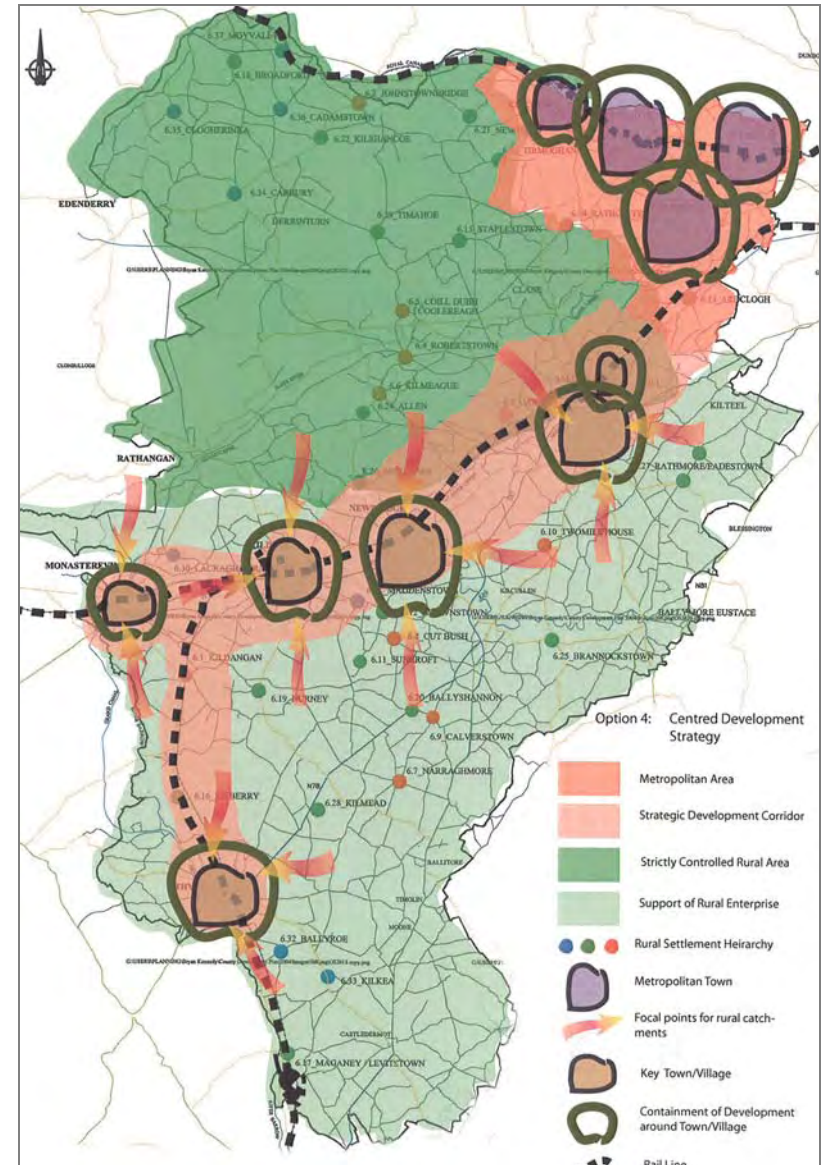
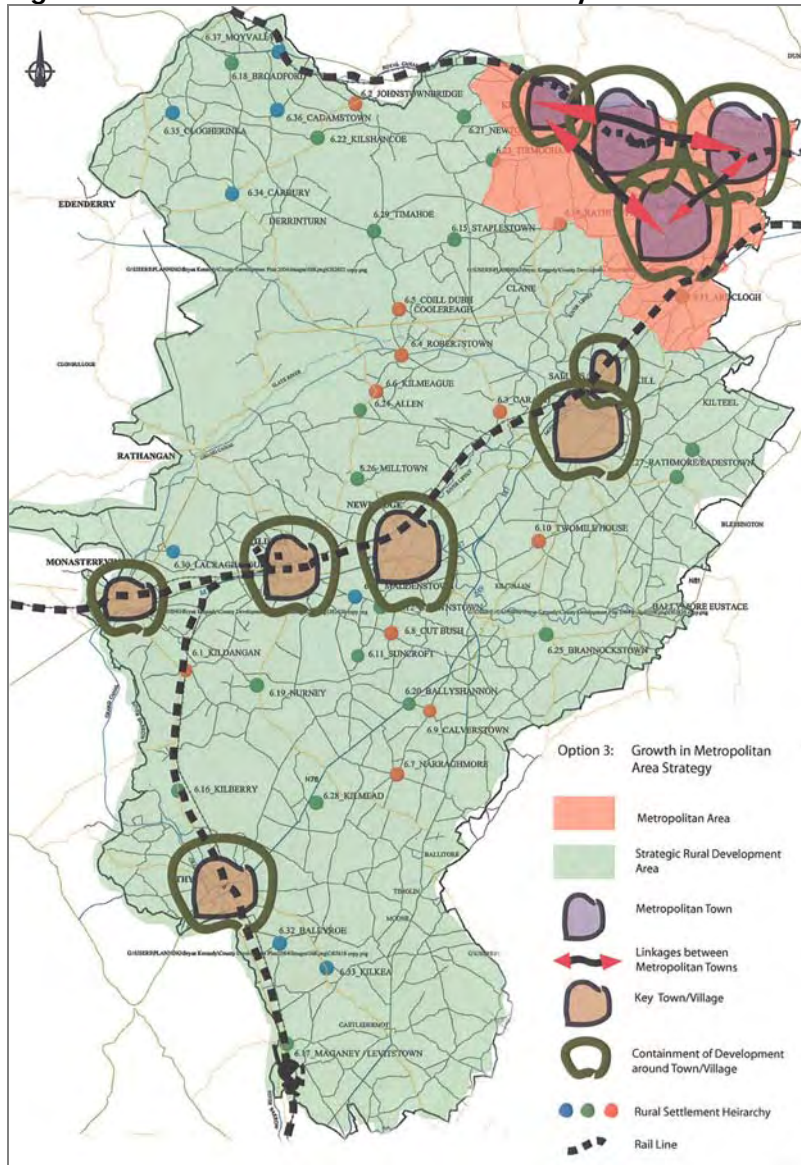


Figure 4.4 Scenario 4: *Centred Development Strategy*

4.2 Evaluation of the Alternative Scenarios

4.2.1 Methodology

This section summarises the evaluation of the Alternative Scenarios which is found in Section 7 of the Environmental Report. Scenarios are evaluated in a succinct and focused way for both planning and environmental impacts against both the existing environment and the Strategic Environmental Objectives (both of which are summarised within Section 3).

4.2.2 Alternative Scenario 1: *Dispersed Development Strategy*

4.2.2.1 Environmental Effects

This scenario is likely to lead to significant increases on pressure on environmental resources in rural areas. In the north-east this pressure is likely to take the form of increasing pollution and drawdown of vulnerable groundwater resources; increased pollution of surface waters; loss of biodiversity and ecological corridors – due to uncontrolled suburbanisation; loss of air quality due to noise and emissions associated with increased levels of dispersed rural and suburban traffic – as well as an overall loss of a clear distinction between rural and suburban areas.

In the south of the county the rural environment is likely to deteriorate due to the gradual cessation of long-established land-use practices that sustain the landscape, habitats and cultural heritage of the County's rural areas.

Around urban areas this scenario is less likely to lead to the establishment of cost-effective provision of shared public infrastructure for transportation or water services – due to low levels of localised population concentration.

4.2.2.2 Critical Planning Evaluation

- Limited development within existing urban centres with instances of inappropriately scaled and designed developments commonplace in the larger towns
- Low density, greenfield development dominant creating low density extensions to urban areas and loss of identity, with urban centres merging together
- Extensive areas of un-controlled development in the rural settlements and rural housing, particularly in the south of the County, decrease the County's agricultural land base
- Villages and towns with lower population bases due to dispersed nature of development in the rural settlements and rural countryside
- Industrial and employment centres are created at inappropriate locations

4.2.2.3 Planning Effects

- The influence of Dublin City and its environs on growth within the commuter belt is dominant with significant expansion to the footprints of the four metropolitan towns
- The rural area experiences significant changes to its environmental quality, character and landscape
- Strategic development does not take place due to the dispersed nature of development that creates a car dependent population
- Lack of critical mass at strategic locations makes the implementation of both urban and rural physical and social infrastructure economically challenging

4.2.3 Alternative Scenario 2: *Structured Development Strategy*

4.2.3.1 Environmental Effects

This scenario is likely to concentrate development, population and demands for infrastructural capacity into the north-eastern part of the county that is most environmentally robust – both on account of the

relatively low density of environmental sensitivities as well as the relatively high concentrations in installed infrastructure with spare capacity – existing and planned. This concentration will contribute to the protection of the more sensitive areas within the County.

The central corridor where the majority of the rest of the population and development are likely to concentrate is also both environmentally robust as well as being already well served by road, rail, power and gas corridors.

The strategy lacks high-level strategic vision for the targeted enhancement and protection of rural areas.

4.2.3.2 Critical Planning Evaluation

- Critical mass is achieved in the at key towns and villages along strategic development corridors
- The Metropolitan towns develop strong physical and employment links with Dublin City and its environs
- Rural areas develop in a sustainable manner by balancing the development of rural area with the protection of the rural environment

4.2.3.3 Planning Effects

- Improved public and private transport and other service infrastructure provision is more economically viable in the at key towns and villages along strategic development corridors
- Rural economy and population is maintained and enhanced
- Environmental quality of the rural area is maintained and enhanced

4.2.4 Alternative Scenario 3: *Growth in the Metropolitan Area Strategy*

4.2.4.1 Environmental Effects

This scenario is likely to concentrate development, population and demands for infrastructural capacity into the north-eastern part of the county that is most environmentally robust – both on account of the relatively low density of environmental sensitivities as well as the relatively high concentrations in installed infrastructure with spare capacity – existing and planned. This concentration will contribute to the protection of the more sensitive areas within the County.

The central corridor where the majority of the rest of the population and development are likely to concentrate is also both environmentally robust as well as being already well served by road, rail, power and gas corridors.

This strategy also appears to envisage some level of rural development to continue to sustain the future viability of smaller more dispersed rural communities.

The strategy lacks high-level strategic vision for the targeted enhancement and protection of rural areas.

4.2.4.2 Critical Planning Evaluation

- Four Metropolitan town experience significant increased levels of urbanisation with higher density and higher quality physical and social infrastructure provision
- Industrial and employment centres are created at inappropriate locations
- The counties employment and physical infrastructure links with Dublin City and environs increase.
- Key towns experience medium level of population growth
- The remaining towns and villages experience natural levels of growth with some smaller settlements experiencing population decline
- Environmental quality and character of rural areas is maintained with decreasing levels of population growth outside the designated urban settlements

4.2.4.3 Planning Effects

- Higher density development in the Metropolitan towns requires the implementation of more comprehensive land use and transportation strategies to ensure the efficient use of land and to guide their strategic development
- Rural economy and population base declines
- Environmental quality of the rural area is maintained and enhanced

4.2.5 Alternative Scenario 4: *Centred Development Strategy*

4.2.5.1 Environmental Effects

This scenario is likely to concentrate development, population and demands for infrastructural capacity into the north-eastern part of the county that is most environmentally robust – both on account of the relatively low density of environmental sensitivities as well as the relatively high concentrations in installed infrastructure with spare capacity – existing and planned. This concentration will contribute to the protection of the more sensitive areas within the County.

The central corridor where the majority of the rest of the population and development are likely to concentrate is also both environmentally robust as well as being already well served by road, rail, power and gas corridors.

Rural Settlements are generally well matched to those areas with lower sensitivities. This strategy also appears to envisage sufficient levels of continued rural development to sustain the future viability of smaller more dispersed rural communities. These are necessary for the continuity of the long established rural land-use patterns that are necessary for the continuity of the landscape, habitats and cultural heritage of the County's rural areas.

This scenario also offers specific and targeted strategies for rural areas that are carefully tailored and targeted to the specific environmental sensitivities and strengths of different rural areas.

4.2.5.2 Critical Planning Evaluation

- Critical mass is achieved in the at key towns and villages in line with the adopted settlement strategy for the County
- The Metropolitan towns develop stronger physical and employment links with Dublin City and its environs
- The population growth rates in the designated rural settlements allow the provision a range of services and employment to their local population
- Rural areas develop in a sustainable manner by balancing the development of rural area with the protection of the rural environment

4.2.5.3 Planning Effects

- Improved public and private transport and other service infrastructure provision are more economically viable in the Metropolitan towns and key towns;
- More focused planning strategies are required to guide the development of the metropolitan area as a whole;
- The population, economy and environmental quality of the rural area is maintained and enhanced by the implementation of a settlement strategy that allows for the development of a rural population in a sustainable manner and the provision of environmentally reasonable rural enterprises, particularly in the south of the County

4.2.6 Evaluation against SEOs

The Environmental Report describes an evaluation of the alternative scenarios against SEOs which is summarised as follows:

- Scenario 1 had 6 *probably conflicting* interactions and 13 *potentially conflicting* interactions with SEOs.
- Scenario 2 had 10 *improving* and 6 *probably conflicting* interactions with SEOs.
- Scenario 3 had 10 *improving* and 6 *potentially conflicting* interactions with SEOs.
- Scenario 4 had 10 *improving* and 14 *potentially conflicting* interactions with SEOs.

4.2.7 Summary; the Alternative Scenario for the Plan

The Alternatives that were examined were produced and evaluated at an earlier - more embryonic - stage to facilitate the evaluation and selection of a plan - having regard, *inter alia* to environmental consequences.

The Development Plan which emerged from the Plan preparation process and was adopted is Scenario 4 *Centred Development* – this Scenario achieves a good balance between potential environmental impact and conformance with relevant National and Regional planning objectives.

The Settlement Hierarchy Map from the County Development Plan is shown on Figure 2.1 in Section 2 of this report.

With the integration of appropriate mitigation measures (including those which are identified in Section 5 of this report) potential adverse environmental effects which could arise as a result of implementing this scenario would be likely to be avoided, reduced or offset.

Alternative Scenario 4 was chosen to be developed for the Development Plan by the plan-making team and adopted by the Elected Members having regard to both:

1. The environmental effects which were identified by the Strategic Environmental Assessment; and,
2. Planning - including social and economic - effects.

Section 5 Mitigation and Monitoring Measures

5.1 Mitigation

Mitigation measures are measures envisaged to prevent, reduce and, as fully as possible, offset any significant adverse impacts on the environment of implementing the Development Plan. Mitigation involves ameliorating significant negative effects. Where there are significant negative effects, consideration is given in the first instance to preventing such effects or, where this is not possible for stated reasons, to lessening or offsetting those effects. Mitigation measures can be roughly divided into those that: *avoid* effects; *reduce* the magnitude or extent, probability and/or severity of effects; *repair* effects after they have occurred, and; *compensate* for effects, balancing out negative impacts with other positive ones.

Mitigation measures have been incorporated into the Plan through the early consideration of environmental sensitivities, through the selection of the Alternative Scenario for the Plan and through policies/objectives for the following topics:

- Biodiversity and Flora and Fauna
- Water Protection
- Water Services
- Flooding
- Waste Management
- Cultural Heritage
- Landscape
- Air and Noise
- Energy and Greenhouse Gas Emissions

Overleaf is a summary table outlining how likely significant effects (if unmitigated) are linked to relevant mitigation measure(s) - which have been integrated into the Plan and indicator(s) which will be used for monitoring.

5.2 Monitoring

The SEA Directive requires that the significant environmental effects of the implementation of plans and programmes are monitored. The Environmental Report contains proposals for monitoring the Plan which are adopted alongside the Plan. Monitoring enables, at an early stage, the identification of unforeseen adverse effects and the undertaking of appropriate remedial action. In addition to this, monitoring can also play an important role in assessing whether the Development Plan is achieving its environmental objectives and targets - measures which the Development Plan can help work towards - whether these need to be re-examined and whether the proposed mitigation measures are being implemented.

The Environmental Report identifies indicators - which allow quantitative measures of trends and progress in the environment over time. Measurements for indicators generally come from existing monitoring sources.

A preliminary monitoring evaluation report on the effects of implementing the Development Plan will be prepared within two years of the making of the plan. The Council is responsible for collating existing relevant monitored data, the preparation of a monitoring report, the publication of this report and, if necessary, the carrying out of corrective action.

The following summary table shows indicators which were selected for monitoring the various environmental components. Also identified on the table are the likely significant effects - if unmitigated - and corresponding mitigation measures.

Table 5.1 SEA Summary Table: Likely Significant Effects, Mitigation Measures and Indicators for Monitoring

Likely Significant Effect, if unmitigated	Mitigation Measure Reference(s) from the Plan (including)	Primary Indicator(s) for Monitoring
Loss of biodiversity with regard to Natura 2000 Sites	Policies: HB 1, NT 5, WS 8, DS 1, DS 2, DS 3, DS 4, DS 5, DS 6 and DS 7 Objective: NHO 5	B1: Conservation status of habitats and species as assessed under Article 17 of the Habitats Directive
Loss of biodiversity with regard to ecological connectivity and stepping stones	Policies: HB 1, NT 1, NT 2, NT 3, NT 4, NT 5, TW 1, TW 2, TW 3, TW 4, TW 5, TW 6, IS 1, IW 1, IW 2, IW 3, IW 4, IW 5, IW 6, IW 7, IW 8 and IW 9 Objectives: NHO 1, NHO 2, NHO 3, NHO 4, NHO 5, NHO 6 NHO 7, NHO 8 and NHO 9	B2: Percentage loss of functional connectivity to macro-corridors, stepping stones and contiguous areas of habitat which are important on a County level without remediation as a result of implementation of the Plan – as evidenced from a resurvey of CORINE mapping
Loss of rural management practices	Policy NHO5 and Various provisions of the Core Strategy, Economic Development Strategy and Housing Chapter	B3: Population of the County involved in land management
Spatially concentrated deterioration in human health arising from exposure to incompatible land uses	Policies: WS 1, WS 2, WS 3, WS 4, WS 5, WS 6, WS 7, WW 1, WW 2, WW 3, WW 4, WW 5, WW 6 AG 3, RH 5, ECD 16, ECD17, WQ 1, WQ 2, WQ 3, WQ 4, WQ 5, WS 6, PC 1, PC 2, PC 3, PC 4, PC 5, PC 6 and NR 4 Objectives: WDO 1, WDO 2, WDO 3, WDO 4, WDO 5, WDO 6, WDO 7, WDO 12, WDO 13, WDO 14, ENO 4, EN 4, EN 6, EN 7, EN 8 and EN 9	HH1: Occurrence (any) of a spatially concentrated deterioration in human health arising from environmental factors as identified by the Health Service Executive and Environmental Protection Agency
Pollution and/or contamination of soils.	Policies: AG 3, RH 5, ECD 16, ECD17, WQ 1, WQ 2, WQ 3, WQ 4, WQ 5 and WS 6 Objectives: WDO 4, ENO 4, EN 7, EN 8 and EN 9	S1: Number of instances of pollution and/or contamination of soil
Adverse impacts upon the quality of surface waters	Policies: WQ 1, WQ 2, WQ 3, WQ 4 and WQ 5 Objective: WDO 4	W1: Classification of Overall Status (comprised of ecological and chemical status) under the European Communities Environmental Objectives (Surface Waters) Regulations 2009 (SI No. 272 of 2009)
Adverse impacts upon ground water quality	Policies: WQ 1, WQ 2, WQ 3, WQ 4 and WQ 5 Objective: WDO 4	W2: Groundwater Quality Standards and Threshold Values under Directive 2006/118/EC
Flooding	Policies: SW 1, SW 2, SW 3, SW 4, SW 5, SW 6, SW 7, SW 8, SW 9, SW 10, SW 11, SW 12, SW 13, SW 14, SW 15, SW 16, SW 17, SW 18, SW 19 and SW 20 Objectives: WDO 9, WDO 10, WDO 11 and WDO 14	W3: Number of developments granted permission on lands which pose - or are likely to pose in the future - a significant flood risk

Likely Significant Effect, if unmitigated	Mitigation Measure Reference(s) from the Plan (including)	Primary Indicator(s) for Monitoring
Inadequate waste water treatment for new populations	Policies: WS 1, WW 1, WW 2, WW 3, WW 4, WW 5, WW 6, WW 7, WW 8, WW 9 and WW 10. Objectives: WDO 1, WDO 2 and WDO 14	M1i: Number of new developments granted permission which can be adequately served with waste water treatment over the lifetime of the Plan M1ii: Preparation of a Water Services Strategic Plan - in compliance with the Water Services Act - for the functional area of the Council
Inadequate drinking water supply for new populations	Policies: WS 1, WS 2, WS 3, WS 4, WS 5, WS 6, WS 7 and WS 9. Objectives: WDO 1, WDO 3, WDO 5, WDO 6, WDO 7, WDO 12 and WDO 13	M2i: Number of non-compliances with the 48 parameters identified in the European Communities (Drinking Water) Regulations (No. 2) 2007 which present a potential danger to human health M2ii: Preparation of a Water Services Strategic Plan - in compliance with the Water Services Act - for the functional area of the Council
Increases in greenhouse gas emissions and increases in car dependency	Policies: TL 2, TL 4 and TL 5 Objectives: ST1, ST 2, ST 3, ST 4, ST 5, ST 6, ST 7, ST 8, ST 9, ST 10, ST 11, ST 12, ST 13, ST 14, ST 16 and ST 15	C1i: Percentage of population within the County travelling to work or school by public transport or non-mechanical means C1ii: Average distance travelled to work or school by the population of the County
Effects on entries to the Record of Monuments and Places	Policies: AH 1, AH 2, AH 3, AH 4, AH 5, AH 6, AH 7 and AH 8 Objective: AAO 14	CH1: Percentage of entries to the Record of Monuments and Places - including Zones of Archaeological Potential - (and their context of the above within the surrounding landscape where relevant) protected
Effects on entries to the Record of Protected Structures and Architectural Conservation Areas	Policies: AH 1, AH 2, AH 3, AH 4, AH 5, AH 6, AH 7, AH 8, PS 1, PS 2, PS 3, PS 4, PS 5, PS 6, PS 7, PS 8, PS 9, PS 10, PS 11, PS 12, PS 13, PS 14, PS 15, PS 16, PS 17, VA 1, VA 2, VA 3, VA 4, VA 5, VA 6, VA 7, ACA 1 and ACA 2 Objectives: AAO 1, AAO 2, AAO 5, AAO 6, AAO 7, AAO 8 and AAO 11	CH2i: Percentage of entries to the Record of Protected Structures (and/or their context within the surrounding landscape where relevant) protected CH2ii: Number of additions to the Record of Protected Structures and the number of additional ACAs
Visual impacts on the landscape or on 'views and prospects to be preserved'	Policies: LA 1, LA 2, LA 3, LA 4, LA 5 and SR 1 Objectives: LO 1, LO 2, LO 3, LO 4, LO 5, LO 6 and LO 8	L1: Number of complaints received from statutory consultees regarding avoidable impacts on the landscape resulting from development which is granted permission under the Plan