Appendix 19a

SEA Environmental Report Non-Technical Summary

Waterford
City & County Council
Comhairle Cathrach
& Contae Phort Láirge

SEA Environmental Report

Appendix IV – Non-Technical Summary

FOR THE

Waterford City and County Development Plan 2022-2028

for: **Waterford City and County Council**

City Hall

The Mall

Waterford City

by: **CAAS Ltd.**

1st Floor

24-26 Ormond Quay Upper

Dublin 7

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Section 1 Introduction and Terms of Reference

This is the Non-Technical Summary of the Environmental Report for the Waterford City and County Development Plan 2022-2028. The purpose of the Environmental Report is to provide a clear understanding of the likely environmental consequences of decisions regarding the adoption and implementation of the Plan. The Environmental Report has been prepared as part of a Strategic Environmental Assessment (SEA) process for the Plan.

What is 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, social and other considerations.

Why is SEA needed? The Benefits

The SEA has been carried out in order to comply with the provisions of the European SEA Directive and in order to enable sustainable development and environmental protection and management. SEA is the planning authority's and the public's guide to what are generally the best areas for development in the City and County.

SEA enables the planning authority to direct development towards robust, well-serviced and connected areas in the City and County – thereby facilitating the general avoidance of incompatible areas in the most sensitive, least well-serviced and least well-connected areas. Compact development can be accompanied by placemaking initiatives to enable the City and the County's towns and villages to become more desirable places to live – so that they maintain and improve services to existing and future communities.

SEA enables requirements relating to environmental protection and management to be integrated into the Plan so that compatible sustainable development in the City and County's sensitive areas is also facilitated.

SEA provides greater to the public and to developers. Plans are more likely to be adopted without delays or challenges and planning applications are more likely to be granted permission. Environmental mitigation is more likely to cost less.

An overlay of environmental sensitivities in Waterford City and County is shown on Figure 1.1.

The overlay mapping shows that environmental sensitivities are not evenly distributed throughout the City and County. Much of the City and County is identified as having low to moderate levels of sensitivity.

The most sensitive areas include:

- Upland and foothill areas of the County, including the Comeragh Mountains, on account of European Site ecological designations, archaeological heritage and landscape sensitives and areas of extreme and high groundwater vulnerability;
- Parts of the coastline and adjacent coastal areas, including Waterford Estuary, Tramore dunes and coast, the mid-Waterford Coast, Dungarvan Harbour, Helvic Head to Ballyquinn, Ardmore Head and the Blackwater Estuary, on account of European Site and proposed Natural Heritage Area and UNESCO Global Geopark designations, WFD RPA designations, areas of extreme groundwater vulnerability and coastal flood risk;
- Certain locations and areas within the existing built-up footprint of the County, including Waterford City, on account of cultural heritage designations, including entries to the Record of Monuments and Places, Entries to the Record of Protected Structures and Architectural Conservation Areas; and
- Certain areas that are adjacent to streams and rivers, on account of flood risk, including those areas along the Rivers Suir and Blackwater and their tributaries.

How does the SEA work?

All of the main environmental issues in the area were assembled and considered by the team who prepared the Plan. This helped them to devise a Plan that contributes towards the protection and management of environmental sensitivities. It also helped to identify wherever potential conflicts between the Plan and the environment exist and enabled these conflicts to be mitigated.

The SEA was scoped in consultation with designated environmental authorities.

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

- A description of the environment and the key environmental issues;
- A description and assessment of alternatives for the Plan;
- An assessment of the provisions of the Plan; and,
- Mitigation measures, which will avoid/reduce the environmental effects of implementing the Plan and will contribute towards compliance with important environmental protection legislation.

Difficulties Encountered during the SEA process

No significant difficulties have been encountered during the undertaking of the assessment. There was limited water services information available for some settlements within the City and County however objectives requiring the provision of appropriate levels of water services alongside new development have been integrated into the Plan.

There is a data gap relating to WFD surface water status data. There are a number of waterbodies within the Plan area with overall status currently not assigned to them and the term “unassigned status” applies in respect of these waterbodies. The SEA ensured that the Plan contains measures that will contribute towards the maintenance and improvement of status of all water bodies within the zone of influence.

There is uncertainty about water services capacity and demand at certain plants in the County. The SEA ensured that the Plan contains measures that will help to ensure that new development is served by adequate and appropriate water services.

What happens at the end of the process?

An SEA Statement is prepared which summarises, inter alia, how environmental considerations have been integrated into the Plan.

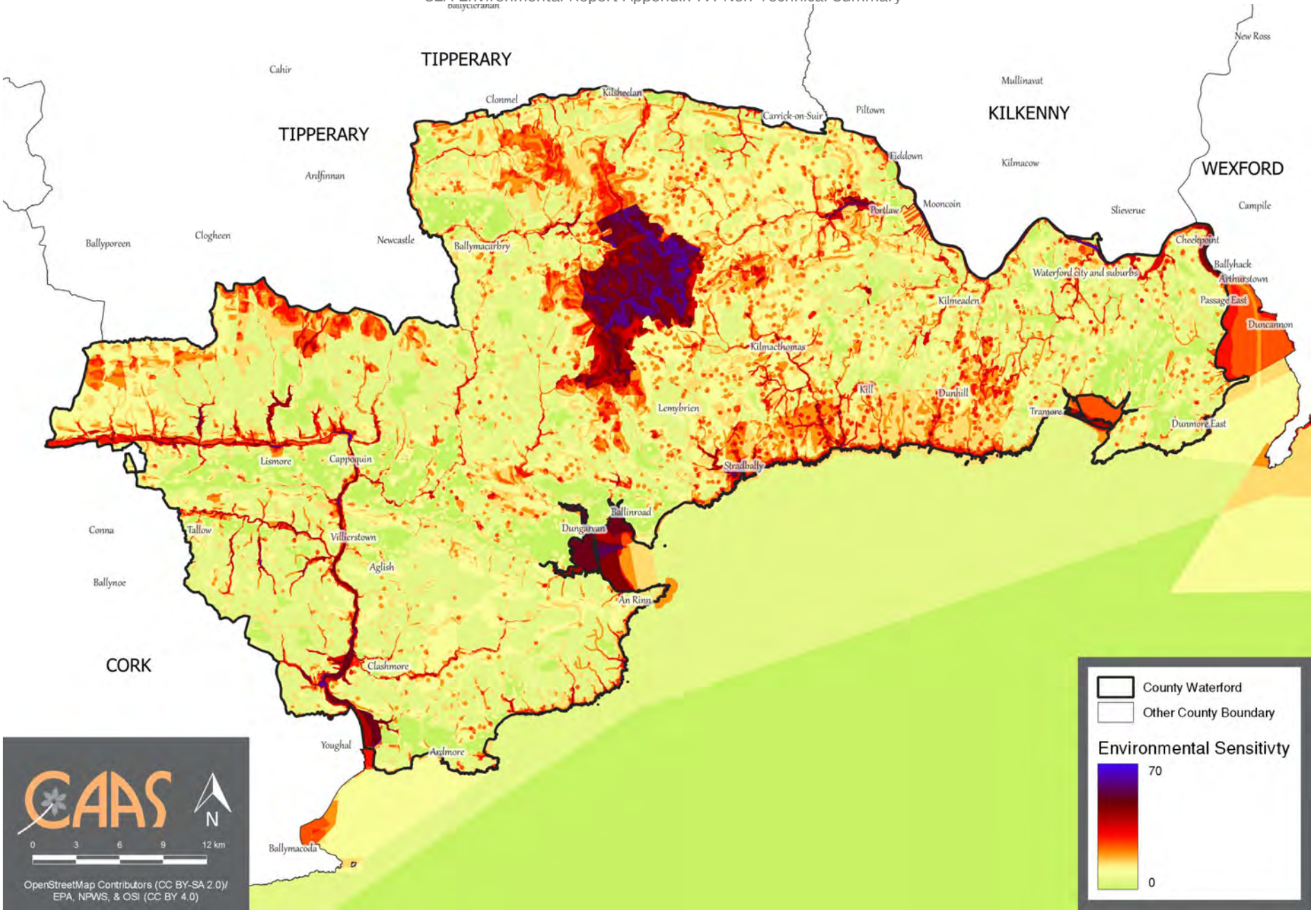

Figure 1.1 Environmental Sensitivities that the Plan directs incompatible development away from

Section 2 The Plan

2.1 Introduction and Content

The Waterford City and County Development Plan is a land use plan and overall strategy for the proper planning and sustainable development of Waterford City and County over the six-year period 2022-2028. The Development Plan comprises a series of separate, but interrelated elements. The Plan is structured as follows:

- Volume 1: Written Statement consisting of the following:
  - Part 1: Vision and Strategy
  - Part 2: Waterford City
  - Part 3: Waterford City & County
- Volume 2: Development Management Standards
- Volume 3: Supporting Appendices (including: Retail Strategy: Housing Need and Demand Assessment; Landscape and Seascape Characterisation Assessment; RPS; ACAs; this SEA Environmental Report; and Natura Impact Report.

2.2 Plan Vision and Core Strategy Strategic Aims

The Vision of the Plan is as follows:

> "By 2028, Waterford City and County will have continued to grow and will be evolving to become an even more attractive, prosperous, resilient, and sustainable place, anchored by Waterford City and Metropolitan area as the Regional Capital, a University and Learning City, and an economic driver for the region. It will be the best city and county in which to live, visit and do business.
>
> We will be recognised as the Regional Capital and for:
> - Our enterprise and inventiveness in the knowledge economy and high-value markets – with a particular focus on biopharmaceuticals, technological innovation, tourism, food and drink, fishing, and the primary industries;
> - The development and growth of our educational capital through our university and its synergies with the broader economy; and,
> - Our unique built, historic, cultural and natural environment, which will be protected and, where appropriate, enhanced as a key asset in underpinning a high quality of health/wellbeing, life and place.
>
> The Council will have taken a proactive approach towards development that promotes and facilitates appropriate and sustainable development, that nonetheless:
> - Ensures the sustainable use of natural resources;
> - Enables us to live within the area's environmental capacity;
> - Enables and enhances our resilience to climate change; and,
> - Creates a more open, diverse and inclusive society."

The Core Strategy Strategic Aims of the Plan are as follows:

1. Based on the population/employment targets and policy objectives of the NPF, RSES & MASP, provide a local policy framework to, support development where it is consistent with the principles of sustainable development, and which is applied through planning decisions which are clear, consistent, robust and risk adverse.
2. Identify investment priorities to deliver and support the settlement strategy and hierarchy, founded on the principle of infrastructure led development.
3. Counteract imbalances in housing type, tenure and location both within settlements, between settlements and across broader rural areas in order to meet the needs of the people of Waterford, mitigating current residential leakage and unsustainable travel patterns.
4. To require, where appropriate, all plans and projects to comply with the requirements of the Strategic Environmental Assessment Directive, the Habitats Directive, Water Framework Directive and Floods Directive. Protect the integrity all Natura 2000 sites, (p) HNA's and locally important Biodiversity Sites in Waterford.
5. To ensure the policies and objectives of the Development Plan demonstrate consistency with the national and regional policy objectives set out in the NPF, RSES and MASP.
6. To implement a tiered and infrastructure led approach to the development of new residential land and engage in active land management to bring forward opportunities for redevelopment where feasible.
7. Develop key infrastructure required to deliver the concentric city model for Waterford City, consistent with the NPF, RSES and MASP and founded on the assimilation of PLUTS and WMATS policy objectives.
8. Implement the Waterford City and County Council Climate Adaptation Strategy 2019 (as amended) and promote a climate resilient pattern of development and land uses which assists in achieving national climate change mitigation and adaption targets.
9. To protect and strengthen the retail primacy of Waterford City within the Southern Region.
10. To protect and enhance the vibrancy and vitality of urban and rural centres and their mixed use functions/capacity as community hubs.

11. To enhance the sense of place throughout settlements in Waterford and deliver 10 minute neighbourhoods through enhanced pedestrian and cycle permeability and mixed land use planning.
12. To protect existing employment and promote new employment areas at strategic locations and in district and local services centres across Waterford County.
13. Acknowledge the vital importance of the tourism sector to economic development and continue to encourage and promote the sustainable development of a range of quality tourism facilities, attractions and accommodation types across Waterford.

2.3 Strategic work undertaken by the Council to ensure contribution towards environmental protection and sustainable development

Far in advance of both the submission of the pre-Draft Plan to the Elected Members for approval, the placing of the Draft Plan on public display and the adoption of the Plan, Waterford City and County Council undertook various works in order to inform the preparation of the Plan. The findings of this strategic work have been integrated into the Plan and will contribute towards both environmental protection and management and sustainable development within the City and County. Strategic work undertaken by the Council includes background work in relation to Plan Strategies and other provisions for a variety of sectors, including: Economy, Tourism, Education and Retail; Transport and Mobility; Utilities Infrastructure, Energy and Communication; Housing and Sustainable Communities; Placemaking; Climate Action, Biodiversity and Environment; Landscape, Coast/ Marine and Blue Green Infrastructure; and Heritage.

2.4 Relationship with other relevant Plans and Programmes

It is acknowledged that many of the major issues affecting the City and County's development are contingent on national policy and government funding. The Plan sits within a hierarchy of statutory documents setting out public policy for, among other things, land use planning, infrastructure, sustainable development, tourism, environmental protection and environmental management. The Plan must comply with relevant higher-level strategic actions and will, in turn, guide lower-level strategic actions. These documents include plans and programmes such as those detailed in Appendix of the main SEA ER. These documents have been subject to their own environmental assessment processes, as relevant. The National Planning Framework (NPF) sets out Ireland's planning policy direction up to 2040. The NPF is to be implemented through Regional Spatial and Economic Strategies (RSESs) and lower tier Development Plans and Local Area Plans. The RSES for the Southern Region sets out objectives for land use planning, tourism, infrastructure, sustainable development, environmental protection and environmental management that have been subject to environmental assessment and must be implemented through the City and County Development Plan. As required by the Planning and Development Act 2000, as amended, the County Development Plan is consistent with and conforms with national and regional policies, plans and programmes, including the NPF and the RSES for the Southern Region. The City and County Development Plan will, in turn, guide lower-level strategic actions, such as Local Area Plans that will be subject to their own lower-tier environmental assessments. In order to be realised, projects included in the City and County Development Plan (in a similar way to other projects from any other sector) will have to comply, as relevant, with various legislation, policies, plans and programmes (including requirements for lower-tier Appropriate Assessment, Environmental Impact Assessment and other licencing requirements as appropriate) that form the statutory decision-making and consent-granting framework.

Section 3 The Environmental Baseline

3.1 Introduction

The summary of the environmental baseline of the City and County is described in this section. This baseline together with the Strategic Environmental Objectives, which are identified in Section 3.11, is used in order to identify, describe and evaluate the likely significant environmental effects of implementing the Plan and in order to determine appropriate monitoring measures.

3.2 Likely Evolution of the Environment in the Absence of the Plan

In the absence of a new Plan it is uncertain how permission for new development would be applied for and considered. The current City and County Plans have contributed towards environmental protection within Waterford City and County. If the current City and County Plans were to expire and not be replaced by a new Plan, this would result in a deterioration of the City and County's planning and environmental protection framework. As a result, there would be an increased likelihood in the extent, magnitude and frequency of adverse effects on all environmental components occurring, including:

- Arising from both construction and operation of development and associated infrastructure:
    - Loss of/damage to biodiversity in designated sites (including European Sites and Wildlife Sites) and Annexed habitats and species, listed species, ecological connectivity and non-designated habitats; and disturbance to biodiversity and flora and fauna;
    - Habitat loss, fragmentation and deterioration, including patch size and edge effects; and
    - Disturbance (e.g. due to noise and lighting along transport corridors) and displacement of protected species such as birds and bats.
- Potential interactions if effects arising from environmental vectors.
- Potential adverse effects on the hydrogeological and ecological function of the soil resource, including as a result of development on contaminated lands.
- Potential for riverbank and coastal erosion.
- Potential adverse effects upon the status of water bodies and entries to the WFD Register of Protected Areas (ecological and human value), arising from changes in quality, flow and/or morphology.
- Increase in flood risk and associated effects associated with flood events.
- Failure to provide adequate and appropriate waste water treatment (water services infrastructure and capacity ensures the mitigation of potential conflicts).
- Failure to adequately treat surface water run-off that is discharged to water bodies (water services infrastructure and capacity ensures the mitigation of potential conflicts).
- Failure to comply with drinking water regulations and serve new development with adequate drinking water (water services infrastructure and capacity ensures the mitigation of potential conflicts).
- Increases in waste levels.
- Potential impacts upon public assets and infrastructure.
- Interactions between agriculture and soil, water, biodiversity and human health – including phosphorous and nitrogen deposition as a result of agricultural activities and the production of secondary inorganic particulate matter.
- Potential conflict between development under the Plan and aiming to reduce carbon emissions in line with local, national and European environmental objectives.
- Potential conflicts between transport emissions, including those from cars, and air quality.
- Potential conflicts between increased frequency of noise emissions and protection of sensitive receptors.
- Potential conflicts with climate adaptation measures including those relating to flood risk management.
- Potential effects on protected and unknown archaeology and protected architecture arising from construction and operation activities.
- Occurrence of adverse visual impacts and conflicts with the appropriate protection of designations relating to the landscape.

3.3 Biodiversity and Flora and Fauna

The most ecologically sensitive and heavily designated and protected areas within County Waterford include upland areas (including peat bogs) and coastal areas (including intertidal flats, islands, sand and dunes). Coastal waters and various rivers and lakes provide habitats for sensitive species. Dispersed areas of marginal agricultural lands that may include ecological sensitivities occur throughout the County's lowlands and foothills.

A network of green spaces, including gardens, parks, graveyards, amenity walks, railway lines and patches of woodland and scrub, provide habitats and ecological connectivity within the County and beyond.

Designated sites within the City and County include Special Areas of Conservation[1] (SACs) and Special Protection Areas[2] (SPAs). These are mapped on Figure 3.1. There are 15 European sites (9 SACs and 6 SPAs) designated within or partially within Waterford City and County. Other ecological designations occur within and adjacent to the City and County and these are detailed in the main SEA Environmental Report.

CORINE[3] land cover mapping shows that the most dominant land cover type throughout the County is pastures. Concentrations of peat bogs occur mainly in the north-west and central parts of the County.

Existing Problems

Ireland's Article 17 report on the Status of EU Protected Habitats and Species in Ireland (DCHG, 2019) identifies various Irish, EU-protected habitats and species to be of unfavourable status and many to be still declining, although it also identifies that a range of positive actions are underway. Categories for pressures and threats on Ireland's habitats and species identified by the report include: Agriculture; Forestry; Extraction of resources (minerals, peat, non-renewable energy resources); Energy production processes and related infrastructure development; Development and operation of transport systems; Development, construction and use of residential, commercial, industrial and recreational infrastructure and areas; Extraction and cultivation of biological living resources (other than agriculture and forestry); and Climate change.

Ireland's Article 12 Birds Directive Reports and the 6th National Report under the Convention of Biological Diversity identify similar issues.

The Plan includes measures to contribute towards the protection of biodiversity and flora and fauna and associated ecosystem services. Previous changes in land uses arising from human development have resulted in a loss of biodiversity and flora and fauna however, legislative objectives governing biodiversity and fauna were not identified as being conflicted with.

[1] SACs have been selected for protection under the European Council Directive on the conservation of natural habitats and of wild fauna and flora (92/43/EEC) due to their conservation value for habitats and species of importance in the European Union. The Habitats Directive seeks to establish Natura 2000, a network of protected areas throughout the EU. It is the responsibility of each member state to designate SACs to protect habitats and species, which, together with the SPAs designated under the 1979 Birds Directive, form Natura 2000.

[2] SPAs have been selected for protection under the 1979 European Council Directive on the Conservation of Wild Birds (79/409/EEC) - referred to as the Birds Directive - due to their conservation value for birds of importance in the EU.

[3] The CORINE (Coordinated Information on the Environment) land cover data series was devised as a means of compiling geo-spatial environmental information in a standardised and comparable manner. CORINE has become a key data source for informing environmental and planning policy on a national and European level. The main land cover type in Ireland is agricultural land including forestry, which accounts for two-thirds of the national landmass. Most of this is permanent grassland pastures. Peatlands and wetlands are the second most widespread land cover type, covering almost one-fifth of the country. While forested areas cover about one-tenth of the country. Despite rapid development in the past two decades, Ireland's landscape is predominantly rural and agricultural.

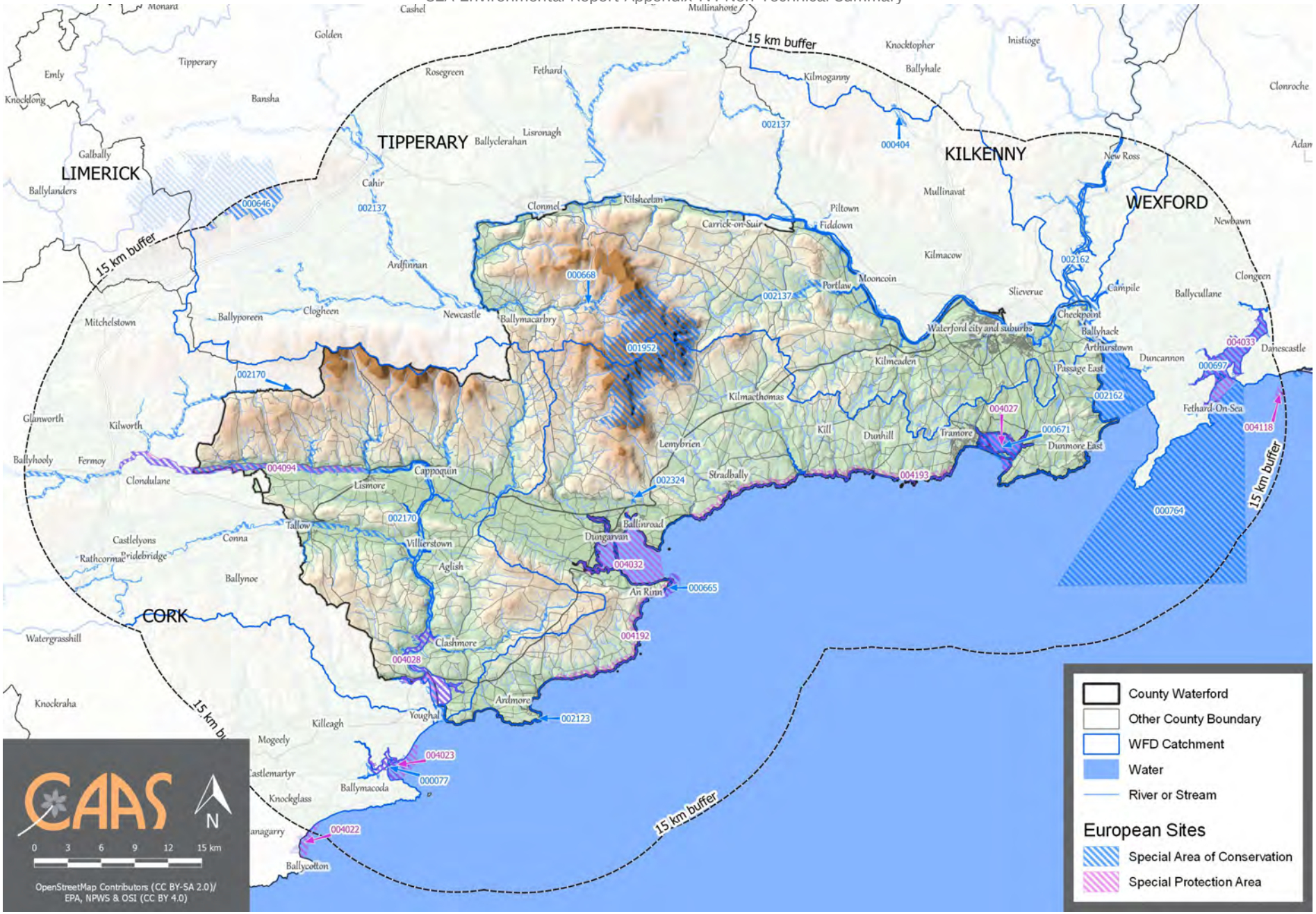

Figure 3.1 European sites within and within 15 km of the County

3.4 Population and Human Health

In the 2016 Census the total population of Waterford City and County was identified as being of 116,176 persons, an increase in total population in the County by c. 2% (c. 2,381 persons) since the previous census. The population growth targets for the County for 2028 and 2031 are 137,630 persons and 144,000 persons respectively.

In the 2016 Census the total population of Waterford City (within the total city area, including Waterford City, Suburbs and Rural) was identified as being 51,615 persons. Waterford Metropolitan Area is identified by Southern Regional Assembly Regional Spatial and Economic Strategy (RSES) as the principal urban centre of the South-East and a Regional City of Scale. The Waterford Metropolitan Area Strategic Plan (MASP) provides a high-level strategic framework for the sustainable development of the Waterford Metropolitan Area. Dungarvan is identified as a Key Town by the Southern RSES for its strategic location and diverse employment sectors.

The Plan designates a hierarchy of the County's settlements as follows:

- City - Metropolitan Area (Waterford City);
- Key Town (Dungarvan, including Ballinroad, Clonmel Environs)
- Large Urban Town (Tramore);
- Urban Town (Dunmore East, Portlaw and Lismore);
- Large Urban Towns (Ardmore, Cappoquin, Gaeltacht na nDéise (including Old Parish), Kilmacthomas, Passage East/Crooke, Stradbally, Tallow);
- Rural Villages (Aglish, Ballyduff Upper, Ballymacarbry, Bonmahon/Knockmahon, Cheekpoint, Clashmore, Conea Power, Dunhill, Kill, Kilmeaden/Ballyduff, Lemybrien/Kilrossanty, Rathgormuck, Touraneena, Villierstown); and
- Rural Nodes (Annestown, Ballylaneen, Ballymacaw, Butlerstown, Faithlegg, Fenor, Grange, Kilbrien, Knockanore, Mellary, Modeligo, Piltown, Whitechurch).

The new population provided for by the Plan will interact with various environmental components. Potential interactions include:

- Recreational and development pressure on habitats and landscapes;
- Increase in demand for waste water treatment at the municipal level;
- Increase in demand for water supply and associated potential impact of water abstraction;
- Potential interactions in flood-sensitive areas; and
- Potential effects on water quality.

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.

Existing Problems

There is historic and predictive evidence of flooding in various locations across the City and County.

The greatest health risk from radiation in Ireland is caused by radon. The presence of radon gas, a naturally occurring radioactive gas that originates from the decay of uranium in rocks and soils, occurs across the country. The number of homes within the City and County with radon levels above the reference level is within the normal range experienced in other locations across the country.

3.5 Soil

Brown earths[4] (occupying north-east, east, south and south-west of the County) are the most dominant soil type in the County. Peatland areas along the uplands of the County are subject to various ecological designations.

[4] Brown earths are well drained mineral soils, associated with high levels of natural fertility.

The audit of County Geological Sites in Waterford City and County was completed in 2012 and identified 55 County Geological Sites[5], including two overview sites of the Copper Coast and Comeragh Mountains. Concentrations of these designations can be found in the upland areas and along the coast.

There are a number of Source Protection Areas in Waterford City and County.

The County has numerous locations with a history of landslide events. Many of these events are associated with the peatland and upland areas in the Comeragh Mountains. The GSI have identified that most of the County has relatively low levels of landslide susceptibility, with moderate and high susceptibility found in upland areas.

3.6 Water

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. 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.

Catchments draining the County include:

- Blackwater (Munster) - an area drained by the River Blackwater and all streams entering tidal water between East Point and Knockaverry, Youghal, County Cork;
- Colligan-Mahon - an area drained by the Rivers Colligan and Mahon and all streams entering tidal water between Cheekpoint and East Point, Country Waterford; and
- Suir - an area drained by the River Suir and all streams entering tidal water between Drumdowney and Cheekpoint, County Waterford.

The main rivers within the County include the Rivers Suir, Blackwater and Bride.

The status of most of the rivers within the County is classified as *moderate*, *good* and *high*, however sections[6] of rivers (including: Suir; St. Johns; Leperstown Stream; and Brickey) are identified as *poor* due to unsatisfactory ecological/biological and/or physio-chemical status.

The surface water status (2013-2018) of lakes within and surrounding the County is identified as *good* (including Carrigavantry) and *moderate* (including Knockaderry, Belle and Ballyshunnock).

The surface water status (2013-2018) of transitional and coastal waterbodies within and surrounding the County is identified as *high* (including: Upper Blackwater Estuary; Tramore Back Strand; and Dungarvan Harbour), *good* (including Lower Suir Estuary, Little Island - Cheekpoint) and *moderate* (including: Barrow/ Suir/Nore Estuary; Lower Blackwater Estuary/ Youghal Harbour; Youghal Bay; and Waterford Harbour), however, some transitional waterbodies (including: Upper Suir Estuary; Middle Suir Estuary; and Colligan Estuary) are identified as *poor* due to unsatisfactory ecological/biological and/or physio-chemical status.

The surface water status (2013-2018) of waterbodies (including rivers and transitional waterbodies) within Waterford City ranges from *moderate* (including the Halfway House Stream) to *poor* (including St. John's River).

Significant pressures, those pressures which need to be addressed in order to improve water quality, have been identified[7] for waterbodies that are 'At Risk' of not meeting their water quality objectives under the WFD.

The WFD surface water status (2013-2018) of rivers within and surrounding the City and County is shown on Figure 3.2.

[5] *The Geological Heritage of Waterford. An audit of County Geological Sites in Waterford*, Geological Survey of Ireland, 2012.
[6] As per EPA classification system (gis.epa.ie/EPAMaps)
[7] EPA (2019): Report on Water Quality in Ireland 2013-2018

The WFD status (2013-2018) of groundwater underlying the entire County is mostly identified as being of *good* status, with areas of *poor* status to north-west of Dungarvan[8] and in parts of the south of Waterford City[9].

Aquifer vulnerability refers to the ease with which pollutants of various kinds can enter into groundwater. The vulnerability of aquifers is classified as being:

- *High and moderate*, throughout most of the County;
- *Low vulnerability,* in small areas throughout the County; and
- *Extreme vulnerability* and *extreme (rock at or near surface or karst)* including in the central and upland areas.

Certain areas across the City and County are at risk of flooding from sources including coastal, groundwater, pluvial[10] and fluvial[11]. There is historic evidence of flooding in various locations across the County, including: along Rivers Blackwater, Colligan, Tay, Mahon and Suir and at various locations along the coastline.

Existing Problems

Subject to exemptions provided for by Article 4 of the WFD, based on available water data, certain surface and groundwater bodies will need improvement in order to comply with the objectives of the WFD.

The Plan includes provisions that will contribute towards improvements in the status of waters.

There is historic and predictive evidence of elevated levels of flood risk at various locations across the City and County.

[8] Underlying a Waste Facility (W0032-02).
[9] Underlying a Waste Facility (W0018-01) and Industrial Facility (P0157-02).
[10] Resulting from high intensity rainfall events where run-off volume exceeds capacity of surface water network.
[11] Watercourse capacity is exceeded or the channel is blocked and excess water spills from the channel onto adjacent floodplains.

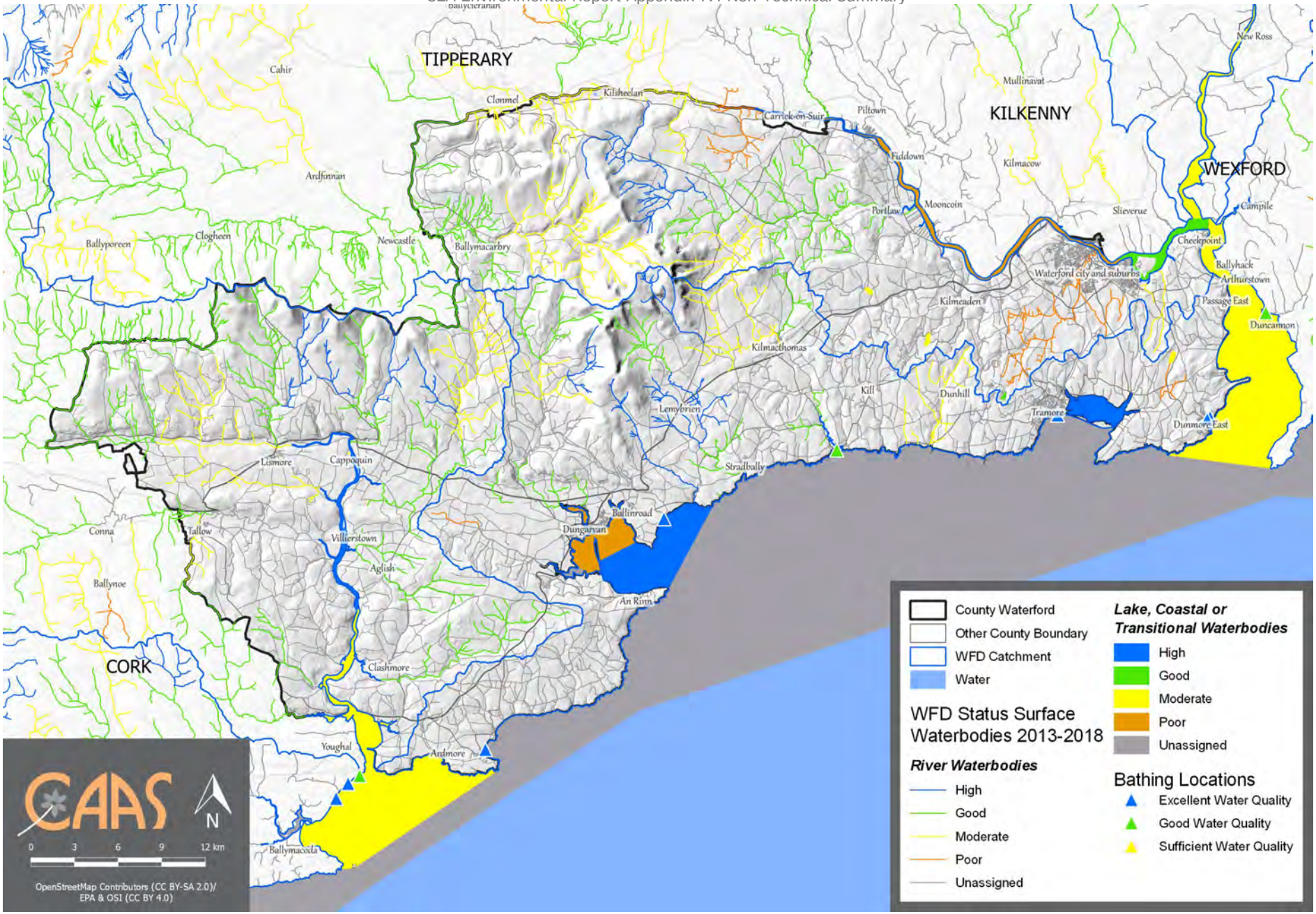

Figure 3.2 Surface Water Status (2013-2018)

3.7 Air and Climatic Factors

Total emissions of greenhouse gases by humans come from various sectors including transport, agriculture, energy industries, manufacturing combustion, industrial processes, residential developments, commercial services developments, waste management processes and fluorinated gases equipment (such as refrigeration and fire protection systems).

The National Climate Action Plan 2021 is an all of Government plan to tackle climate change and bring about a step change in Ireland's climate ambition over the coming years. The Plan sets out an ambitious course of action over the coming years to address the diverse and wide-ranging impacts climate disruption is having on Ireland's environment, society, economic and natural resources. The Climate Action Plan sets out clear 2030 targets for each sector with the ultimate objective of achieving a transition to a competitive, low-carbon, climate-resilient, and environmentally sustainable society and economy by 2050. The Action Plan deals with both mitigation and adaptation.

Climate mitigation describes action to reduce the likelihood of climate change occurring or reduce the impact if it does occur. This can include reducing the causes of climate change (e.g. emissions of greenhouse gases) as well as reducing future risks associated with climate change.

The Climate Change Advisory Council's Annual Review 2020 identifies that the most recent projections demonstrate that, under different assumptions, Ireland will not meet its emissions reduction targets, even with the additional policies and measures included in the 2018 National Development Plan (superseded in 2021). The projections also show that progress on reducing emissions is sensitive to the future path of fuel prices. A significant and sustained rate of emissions reduction of approximately - 2.5% per year is required to meet our objectives for 2050. It is noted that additional measures within the recent Climate Action Plan are not included.

Climate adaptation is a change in natural or human systems in response to the impacts of climate change. These changes moderate harm or exploit beneficial opportunities and can be in response to actual or expected impacts.

The National Adaptation Framework Department of Communications, Climate Action and Environment, 2018), sets out the national strategy to reduce the vulnerability of the country to the negative effects of climate change and to avail of positive impacts. The National Adaptation Framework outlines a whole of government and society approach to climate adaptation. Under the Framework, a number of Government Departments will be required to prepare sectoral adaptation plans in relation to a priority area that they are responsible for.

The Waterford City and County Council Climate Change Adaptation Strategy 2019-2024 seeks to:

- Ensuring the effective and efficient delivery of functions and services under changing climatic conditions to reduce risk and increase resilience.
- Integrating climate change and adaptation considerations into policies and decision-making processes.
- Responding effectively to emergency situations to extreme weather events.
- Managing climate change risks to public assets owned or managed by WCCC (on behalf of or in partnership with other bodies/agencies).
- Translating and implementing national adaptation polices and cross-sectoral adaptation initiatives at a local level e.g. CFRAM mapping.
- Ensuring access to up to date and relevant climate change data and information to maintain an understanding of risks/vulnerabilities that the changing climate presents to local communities, local economic development, the natural environment and opportunities arising to support adaptation actions.
- Working with communities and local organisations to build resilience and adaptive capacity.
- Collaborating through partnerships with other agencies to achieve effective climate adaptation for Waterford.

The EPA's (2020) Air Quality in Ireland 2019 identifies that:

- Air quality in Ireland is generally good however there are localised issues;
- Nitrogen dioxide (NO_2) from transport emissions is polluting urban areas; and
- Ireland was above World Health Organization air quality guideline value levels at 33 monitoring sites – mostly due to the burning of solid fuel within settlements across the country.

With regard to solutions, the report identifies that:

- To tackle the problem of particulate matter, clean ways of heating homes and improve energy efficiency of homes can be progressed; and
- To reduce the impact of nitrogen dioxide, transport options in the Government's Climate Action Plan can be implemented and transport choices can be considered by individuals.

In order to comply with European Directives relating to air quality, the EPA manages the National Ambient Air Quality Network and measures the levels of a number of atmospheric pollutants at locations across the country. The current [12] air quality within the Plan area is identified by the EPA as being *good*.

3.8 Material Assets

Other material assets, in addition to those referred to below, covered by the SEA include archaeological and architectural heritage (see Section 3.9) natural resources of economic value, such as water and air (see Sections 3.6 and 1.1).

Public Assets and Infrastructure
Public assets and infrastructure that have the potential to be impacted upon by the Plan, if unmitigated, include; settlements; resources such as public open spaces, parks and recreational areas; public buildings and services; transport and utility infrastructure (electricity, gas, telecommunications, water supply, wastewater infrastructure etc.); forestry; and natural resources that are covered under other topics such as water and soil.

Waste Water
The EPA's 2020 report *'Urban Wastewater Treatment in 2019'* identified that:

- Wastewater treatment at 19 towns and cities (including **Portlaw**) did not meet European standards for the treatment of urban wastewater in 2018;
- Wastewater from 48 areas (including **Dungarvan** and **Kill**) is the main significant pressure on waters at risk of pollution;
- **There are four urban areas in the County that are listed as Priority Areas** (**Dungarvan, Kill** and **Portlaw**) where improvements are required to resolve urgent environmental issues with respect to wastewater treatment.

The County is served by Wastewater Treatment Plants (WWTPs) that are in the ownership and maintenance of Irish Water. In unserviced areas and outside the main settlements, the main method of sewage disposal is by individual septic tanks and proprietary wastewater treatment systems. Waterford City is served by the Waterford City WWTP, which has a designed capacity of 190,600 PE.

Irish Water has provided information on wastewater treatment capacity, constraints and projects planned within the County to improve the existing network, to assist the Council in the preparation of the new County Development Plan. Spare treatment capacity is identified as being available in most of the settlements, except for Annestown, Fenor, Clonea Power and Bonmahon/Knockmahon. The highest levels of headroom are available at Waterford City and Suburbs, Dungarvan and Dunmore East.

Waterford City and County Council will work alongside and facilitate the delivery of Irish Water's Water Services Investment Programme, to ensure that all lands zoned or identified for development are serviced by an adequate wastewater collection and treatment system and in particular, to secure the delivery of regional and strategic wastewater schemes. In particular, to support and facilitate the delivery of new or improved wastewater treatment plants.

Water Supply
Irish Water is responsible for providing and maintaining adequate public water supply infrastructure throughout the County. There are 48 Water Resource Zones (WRZ) in County Waterford. The largest water resource zone is the East Waterford WRZ which serves Waterford City and Tramore, as well as a large rural hinterland and several villages. The Dungarvan WRZ serves Dungarvan Town, as well as some smaller villages and rural hinterland.

The EPA publishes their results in annual reports that are supported by Remedial Action Lists (RALs). The RAL identifies water supplies that are not in compliance with Drinking Water Regulations. The most recent available RAL (Q4 of 2020 published in January 2021) identifies one County Waterford drinking water supply:

- **The Dungarvan Water Supply** is listed on the most recent EPA RAL due to poor turbidity removal. This Water Supply Scheme has a supply volume of 5,958 m^3/day, serving a population of 11,472 people. The proposed plan of action to remedy this issue is to upgrade the water treatment plant - install run to waste facility, turbidity monitors on each borehole, flow meters and level probes to be completed by June 2021.

[12] 07/04/2021 (http://www.epa.ie/air/quality/)

Currently, Irish Water is developing the National Water Resource Plan outlining how to move to a sustainable, secure and reliable public drinking water supply over a 25-year period while safeguarding the environment. It will outline how Irish Water intends to maintain a balance between supply from water sources around the country and demand for drinking water over the short, medium and long term. This will facilitate future planning and ensure provision of sufficient, safe, clean drinking water to facilitate the social and economic growth of the County.

It is the policy of the Council to work in conjunction with Irish Water to protect existing water infrastructure, to maximise the potential of existing capacity and to facilitate the timely delivery of new wastewater services infrastructure to facilitate future growth.

Waste Management
Waste management across the City and County is guided by the Southern Waste Management Plan 2015-2021.

Transport
Road and rail infrastructure in the City and County has the potential to support reductions in energy demand from the transport sector, including through electrification of modes.

Land
The Plan seeks to assist with the reuse and regeneration of brownfield sites thereby contributing towards sustainable mobility and reducing the need to develop greenfield lands and associated potential adverse environmental effects. Brownfield lands are generally located within urban/suburban areas.

Existing Problems
There are a number of challenges with respect to the provision of water services infrastructure, some of which are summarised above.

The provisions of the new County Development Plan will contribute towards protection of the environment with regard to impacts arising from material assets.

3.9 Cultural Heritage

Archaeological Heritage
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.

Waterford is Ireland's oldest city and has a rich and significant archaeological heritage, with the largest collection of medieval urban defences in Ireland with six intact towers, and over 700m meters of wall. There are many sites of significant archaeological interest in County, including the remains of a 9th century settlement in Woodstown along the River Suir - a unique and internationally important Viking site.

There are hundreds of Recorded Monuments within the County, including graveyards, castles, forts, crosses and churches. Clusters of archaeological heritage in the County are concentrated in the foothills of the mountains, along the coast and within and surrounding towns and villages. There are lower concentrations in the central upland areas.

County Waterford has significant industrial heritage with many sites documented by the National Monuments Service, including its industrial mining heritage within the Copper Coast Global UNESCO Geopark.

Architectural Heritage
The term architectural heritage is defined in the Architectural Heritage (National Inventory) and Historic Monuments Act 1999 as meaning all: structures and buildings together with their settings and attendant grounds, fixtures and fittings; groups of structures and buildings; and, sites which are of technical, historical, archaeological, artistic, cultural, scientific, social, or technical interest.

Records of Protected Structures are legislated for under Section 12 and Section 51 of the Planning and Development Act 2000 as amended. Protected structures are defined in the Planning and Development Act

2000 as amended as structures, or parts of structures that are of special interest from an architectural, historical, archaeological, artistic, cultural, scientific, social or technical point of view. There are 1,477 entries to the Record of Protected Structures within the County, including 677 in the City. Similar to the general spatial spread of archaeological heritage, clusters of architectural heritage are located within the County's settlements.

Waterford's rich industrial and maritime heritage (such as mills, quays and lighthouses) and vernacular heritage (including town houses, thatched cottages and farm complexes) contribute significantly to the built heritage character of the County.

In addition to Protected Structures, the Planning and Development Act provides the legislative basis for the protection of Architectural Conservation Areas (ACAs). An ACA is a place, area or group of structures or townscape that 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. Existing ACAs are designated in Dungarvan and Waterford City at Trinity and South Quay.

ACAs are proposed for designation for various settlements.

Existing Problems
No existing conflicts with legislative objectives governing archaeological and architectural heritage have been identified.

3.10 Landscape

Waterford has a very diverse landscape including uplands, waterway corridors, demesne and coastal landscapes. Mountain regions, including the Comeragh Mountains, are found mainly in the north-west and centre of the County, and several south-flowing river systems, including the Suir, the Blackwater and the Bride, and a rugged coastline with many coves and beaches in the east and south-east of the County. The east of the County is low-lying and has a concentration of lakes and wetlands.

The Landscape and Seascape Character Assessment for Waterford City and County identifies six landscape types:

- Coastal;
- River Corridor and Estuary;
- Farmed Lowland;
- Foothill;
- Upland; and
- Urbanised.

Existing Environmental Problems
New developments have resulted in changes to the visual appearance of lands within the City and County however legislative objectives governing landscape and visual appearance were not identified as being conflicted with

3.11 Strategic Environmental Objectives

Strategic Environmental Objectives (SEOs) are methodological measures developed from policies that generally govern environmental protection objectives established at international, Community or Member State level e.g. the environmental protection objectives of various European Directives that have been transposed into Irish law and that are required to be implemented. The SEOs are set out under a range of topics and are used as standards against which the provisions of the Plan and the alternatives are evaluated in order to help identify which provisions would be likely to result in significant environmental effects and where such effects would be likely to occur, if - in the case of adverse effects - unmitigated.

Table 3.1 Strategic Environmental Objectives

Environmental Component	Guiding Principle	Strategic Environmental Objectives
Biodiversity, Flora and Fauna	No net contribution to biodiversity losses or deterioration	• To preserve, protect, maintain and, where appropriate, enhance the terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species • Ensure no adverse effects on the integrity of any European site, with regard to its qualifying interests, associated conservation status, structure and function • Safeguard national, regional and local designated sites and supporting features which function as stepping stones for migration, dispersal and genetic exchange of wild species • Enhance biodiversity in line with the National Biodiversity Action Plan and its targets • To protect, maintain and conserve the City and County's natural capital
Population and Human Health	Improve quality of life for all ages and abilities based on high-quality, serviced, well connected and sustainable residential, working, educational and recreational environments	• Promote economic growth to encourage retention of working age population and funding of sustainable development and environmental protection and management • Ensure that existing population and planned growth is matched with the required public infrastructure and the required services • Safeguard the City and County's citizens from environment-related pressures and risks to health and well-being
Soil (and Land)	Ensure the long-term sustainable management of land	• Protect soils against pollution, and prevent degradation of the soil resource • Promote the sustainable use of infill and brownfield sites over the use of greenfield sites within the City and County • Safeguard areas of prime agricultural land and designated geological sites
Water	Protection, improvement and sustainable management of the water resource	• Ensure that the status of water bodies is protected, maintained and improved in line with the requirements of the Water Framework Directive • Ensure water resources are sustainably managed to deliver proposed regional and County growth targets in the context of existing and projected water supply and wastewater capacity constraints ensuring the protection of receiving environments • Avoid inappropriate zoning and development in areas at risk of flooding and areas that are vulnerable to current and future erosion, particularly coastal areas • Integrate sustainable water management solutions (such as SuDS, porous surfacing and green roofs) into development proposals
Material Assets	Sustainable and efficient use of natural resources	• Optimise existing infrastructure and provide new infrastructure to match population distribution proposals in the City and County – this includes transport infrastructure • Ensure access to affordable, reliable, sustainable and modern energy for all which encourages a broad energy generation mix to ensure security of supply – wind, solar, hydro, biomass, energy from waste and traditional fossil fuels • Promote the circular economy, reduce waste, and increase energy efficiencies • Ensure there is adequate sewerage and drainage infrastructure in place to support new development • Reduce the energy demand from the transport sector and support moves to electrification of road and rail transport modes • Encourage the transition to a zero-carbon economy by facilitating the development of a grid infrastructure to support renewables and international connectivity. Reduce the average energy consumption per capita including promoting energy efficient buildings, retrofitting, smart- buildings, cities and grids
Air	Support clean air policies that reduce the impact of air pollution on the environment and public health	• To avoid, prevent or reduce harmful effects on human health and the environment as a whole resulting from emissions to air from all sectors with particular reference to emissions from transport, residential heating, industry and agriculture • Maintain and promote continuing improvement in air quality through the reduction of emissions and promotion of renewable energy and energy efficiency • Promote continuing improvement in air quality • Reduction of emissions of sulphur dioxide, nitrogen oxides, volatile organic compounds, ammonia and fine particulate matter which are responsible for acidification, eutrophication and ground-level ozone pollution • Meet Air Quality Directive standards for the protection of human health — Air Quality Directive • Significantly decrease noise pollution by 2020 and move closer to WHO recommended levels
Climatic Factors	Achieving transition to a competitive, low carbon, climate-resilient economy that is cognisant of environmental impacts	• To minimise emissions of greenhouse gasses • Integrate sustainable design solutions into the City and County's infrastructure (e.g. energy efficient buildings; green infrastructure) • Contribute towards the reduction of greenhouse gas emissions in line with national targets • Promote development resilient to the effects of climate change • Promote the use of renewable energy, energy efficient development and increased use of public transport
Cultural Heritage	Safeguard cultural heritage features and their settings through responsible design and positioning of development	• Protect places, features, buildings and landscapes of cultural, archaeological or architectural heritage
Landscape	Protect and enhance the landscape character	• To implement the Plan's framework for identification, assessment, protection, management and planning of landscapes having regard to the European Landscape Convention

Section 4 Alternatives

4.1 Introduction

The SEA Directive requires that reasonable alternatives (taking into account the objectives and the geographical scope of the plan or programme) are identified, described and evaluated for their likely significant effects on the environment. Available reasonable alternatives for the City and County Development Plan are provided below.

4.2 Limitations in Available Alternatives

The Plan is required to be prepared by the Planning and Development Act 2000 (as amended), which specifies various types of objectives that must be provided for by the Plan. The alternatives available for the Plan are limited by the provisions of higher-level planning objectives, including those of the National Planning Framework (NPF) and the Regional Spatial and Economic Strategy (RSES) for the Southern Region and associated Waterford Metropolitan Area Strategic Plan (MASP). These documents set out various requirements for the content of the Plan including on topics such as settlement typology, land use zoning and the sustainable development of rural areas.

4.3 Assessment of Alternatives for an Ecosystem[13] Services Approach to the Plan

Alternative A: "A Plan that takes a more focused Ecosystems Services Approach" would integrate a strategy throughout the Plan for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way.

Principles that would be integrated throughout the Plan, in a coordinated and comprehensive manner, would include:

- Consideration of natural systems - by using knowledge of interactions in nature and how ecosystems function;
- Taking into account of the services that ecosystems provide - including those that underpin social and economic well-being, such as flood and climate regulation or recreation, culture and quality of life; and
- Involving people - those who benefit from the ecosystem services and those managing them need to be involved in decisions that affect them.

This would mean that there would be:

- An increased likelihood in the extent, magnitude and frequency of positive effects occurring with regard to natural capital and ecosystem service issues, such as the management of air quality, noise pollution, light pollution, pollination, flood risk, water bodies and river basins and natural resources supporting energy production and recreation; and
- A decreased likelihood in the extent, magnitude and frequency of adverse effects on natural capital and ecosystem services.

Alternative B: "A Plan that does the basics but takes a less focused Ecosystems Services Approach" would not integrate a strategy throughout the Plan for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way.

A less-interventionist approach to Ecosystems Services would provide less focus and attention to Ecosystem Services than would be the case under Alternative A and would not contribute towards achieving policy objectives of the RSES or NPF to the same degree as Alternative A.

[13] Ecosystems are multifunctional communities of living organisms interacting with each other and their environment. Ecosystems provide a series of services for human well-being (ecosystem services) either directly or indirectly contributing towards human wellbeing

As has been the case over previous plan periods, many natural capital and ecosystem service issues would be integrated into individual Plan Policy Objectives and into decision making at lower tiers of plan preparation and development management. However, this approach would be less coordinated and comprehensive than would be the case under Alternative A.

This would mean that there would be:

- A decreased likelihood in the extent, magnitude and frequency of positive effects occurring with regard to natural capital and ecosystem service issues; and
- An increased likelihood in the extent, magnitude and frequency of adverse effects on natural capital and ecosystem services.

Selected Alternative: Alternative A.

4.4 Assessment of Alternatives for an infrastructure led approach to the Plan

In terms of infrastructure led approach to the plan, two alternatives can be considered:

- **Alternative A:** A Plan that takes a strict infrastructure led approach.

  It is essential that development under the Plan is adequately served by infrastructure. An infrastructure led approach would support achieving the objectives of the NPF and RSES and associated Waterford MASP. An infrastructure led approach would provide a strategy for sustainable compact growth in all settlements, contribute to carbon reduction targets and achieve environmental enhancement and economic growth.

  This alternative ensures that the sustainable development of settlements occurs, with new development accompanied by adequate and appropriate infrastructure.

  This alternative would also facilitate the development of a concentric Waterford City, both north and south of the River Suir, and other key enablers for the MASP area.

  This alternative would benefit the efficient provision of infrastructure and the environment (including water, human health, ecology and air/climate) the most and would provide the highest levels of certainty and coherence to both decision makers and stakeholders, including residents and potential developers. Applications for developments would be more likely to be successful, and residual adverse effects would be least likely. This approach would also contribute towards compliance with the objectives of the RSES and NPF.

- **Alternative B**: A Plan that does not takes a less strict infrastructure led approach.

  This alternative considers existing and future demand and capacity in infrastructure but the allocation of growth and associated policy responses are looser than under Alternative A. Decisions relating to infrastructure assessment are left to project level wherever this is possibly.

  This alternative would benefit the efficient provision of infrastructure and the environment (including water, human health, ecology and air/climate) the least and would provide reduced levels of certainty and coherence to both decision makers and stakeholders, including residents and potential developers. Applications for developments would be less likely to be successful, and residual adverse effects would be more likely. Taking a less strict infrastructure led approach would not contribute towards achieving policy objectives of the RSES or NPF to the same degree as Alternative A.

Selected Alternative: Alternative A.

4.5 Assessment of Alternatives for Rural Waterford

(i) Rural Areas under Strong Urban Influence/Pressure

- **(i) Alternative A:** Designate Rural Areas under Strong Urban Influence/ Pressure

  The methodology behind Alternative A, would build on the current policy framework set out in the Waterford County Development Plan 2011 – 2017, and would be consistent with the strategy and policy objectives of the NPF and RSES, and Section 28 Ministerial guidelines.

  Alternative A provides for a robust and transparent policy approach to manage rural housing.

  Restricting the development of single dwellings in rural areas that are under strong urban influence/pressure would positively impact upon the protection and management of the environment and sustainable development. The restrictions would help to both reduce levels of greenfield development in areas immediately surrounding existing centres and encourage brownfield development within existing centres.

  Single dwellings in rural areas would be facilitated as appropriate and urban development would be directed towards established settlements. This alternative would help to prevent low density urban sprawl and associated adverse effects upon sustainable mobility, climate emission reduction targets and various environmental components.

- **(i) Alternative B:** Do not designate Rural Areas under Strong Urban Influence/Pressure and assess each planning application on its merits.

  In terms of aligning the SEA, AA, SFRA and the Plan Policy Objectives, pursuing Alternative B would raise significant challenges in assessing the full impacts and effects of the alternative strategy approach on the environment, particularly water quality, biodiversity, loss of productive capacity, road capacity and carbon footprint. Furthermore, such an Alternative would be contrary to the NPF, RSES and Ministerial guidelines.

  Alternative B Provides a vague and unclear policy approach to rural housing and risks facilitating a significant increase in urban-generated one-off housing in the open countryside which will undermine the role of small towns and villages and have consequences for the environment.

  Not restricting the development of single dwellings in rural areas that are under strong urban influence/pressure would adversely impact upon the protection and management of the environment and sustainable development. The absence of restrictions would result in increased levels of greenfield development in areas immediately surrounding existing centres and less demand for brownfield development within existing centres.

  Urban generated housing development would occur within rural areas outside of established settlements. This alternative would result in low density urban sprawl and associated adverse effects upon sustainable mobility, climate emission reduction targets and various environmental components.

  It is considered that Alternative A is the most appropriate means of ensuring that a sustainable approach to rural housing need and demand can be met, in a manner that considers the requirements of communities, and those of the NPF and RSES.

Selected Alternative: Alternative A.

(ii) Villages/Clusters/Nodes and Serviced Sites

- **(ii) Alternative A:** Provide focus to and targeted policies/objectives for rural villages, clusters and nodes to act as a viable alternative to one-off housing in the open countryside.

  Alternative A, by providing focus to and targeted policy objectives for the rural villages, clusters and nodes would facilitate a viable alternative to one-off housing in the open countryside. Development within these settlements would be more likely to be served by infrastructure (including water services infrastructure) and more likely to protect the environment including the status of ground and surface waters, water used for drinking water, human health, biodiversity and flora and fauna and the landscape. Development would be required to be subject to siting, design, protection of residential amenities and normal development management criteria, subject to the satisfactory provision of infrastructure and services and in keeping with the character of the settlement.

  The identification of rural villages, clusters and nodes to facilitate a choice in providing for the housing and community needs of rural areas is an important element of supporting a choice and mix of housing within Waterford. This alternative would facilitate this by way of identifying such locations, and setting out development boundaries within which development may take place.

- **(ii) Alternative B:** Rural villages, clusters and nodes are included but there is no focus or no targeted provisions for these locations to act as a viable alternative to one-off housing in the open countryside

  Alternative B, by not providing a focus to and targeted policy objectives for rural villages, clusters and nodes would be less likely to provide a viable alternative to one-off housing in the open countryside. Development within the open countryside would be less likely to be served by infrastructure (including water services infrastructure) and less likely to protect the environment including the status of ground and surface waters, water used for drinking water, human health, biodiversity and flora and fauna and the landscape. Alternative B would the least sustainable of these two alternatives and would be most harmful to the environment.

  Identifying areas within existing villages and nodes to support clustering of residential development across rural Waterford is an important element of providing choice in the housing market outside of urban settlements, in a manner consistent, in principle, with the NPF and RSES. Alternative A is therefore preferred.

Selected Alternative: Alternative A.

4.6 Assessment of Alternatives for Densities

Alternatives identified relating to densities comprise:

Alternative A: Application of a single standard residential density across all settlements.

The application of a low net singular residential density across the City and County would have the potential to push new development towards more environmentally sensitive lands that are less well-serviced and less well-connected, resulting in unnecessary potentially significant adverse effects on all environmental components.

The application of a singular high net residential density could result in a potential mis-alignment between the supply of zoned land to meet the projected demand for new housing. This could result in a misalignment between new development and essential services provision with associated potential for adverse effects on environmental components.

Alternative B: The Application of different densities at different locations, as appropriate, would provide for the most sustainable development, which would contribute towards environmental protection and management the most.

> Higher densities would be provided where sustainable transport mode opportunities are available and lower densities would be provided where constraints are presented by, for example, wastewater and water infrastructure constraints, cultural heritage designations or the local road network. This approach would contribute towards national and regional strategic outcomes including the efficient use of land, compact growth and the transition towards a low carbon and more climate resilient society.
>
> Alternative B would help to ensure compact, sustainable development within and adjacent to the existing built-up footprint and would conflict with the protection and management of environmental components the least. Alignment between new development and essential services provision would be most likely under Alternative B.

Taking cognisance of the range and diversity of settlements across the functional area of the development plan, and the settlement typology/ hierarchy, it is considered that Alternative B is the most sustainable option for delivering on the principles of compact growth, while facilitating placemaking, and the development of diverse rural areas a range of options for the housing market in terms of house type mix, tenure, design and cost, and delivering the Housing Strategy. Alternative B takes into account the objectives of the higher-level NPF and Southern RSES, and the need to comply with the densities set out in Ministerial Guidelines, including those related to *Sustainable Residential Development in Urban Areas (2009)* and *Urban Development and Building Heights (2018)*.

Selected Alternative: Alternative B.

4.7 Assessment of Alternatives for Land Use Zoning

Alternatives for Land Use Zoning are assessed on Table 4.1.

Table 4.1 Assessment of Alternatives against Strategic Environmental Objectives

Town	Alternative (selected alternatives in **bold**)	Commentary
Waterford City & Suburbs	**Alternative A: More Compact**	By consolidating land use zoning and reducing unnecessary land use zoning this alternative would provide for a more compact form of development that would help to maximise benefits from infrastructural investment. By consolidating the zoning and helping to avoid unnecessary sprawl of the City and suburbs, this alternative would increase the likelihood of brownfield development and contribute towards efforts to improve sustainable mobility (with associated effects on energy, air, noise and human health). Reducing unnecessary zoning would help to minimise sprawl and would avoid potential adverse environmental effects that would otherwise occur - this would benefit the protection of multiple environmental components.
	Alternative B: Less Compact	By not consolidating land use zoning and including unnecessary land use zoning, this alternative would provide for a less compact form of development that would fail to maximise benefits from infrastructural investment. By facilitating the unnecessary sprawl of the City and suburbs and failing to consolidate zoning, this alternative would decrease the likelihood of brownfield development and conflict with efforts to improve sustainable mobility (with associated effects on energy, air, noise and human health). Providing for unnecessary zoning would be likely to result in higher levels of sprawl and associated avoidable potential adverse environmental effects.
Dungarvan/ Ballinroad	Alternative A: More Compact **see note below**	By consolidating land use zoning and reducing unnecessary land use zoning this alternative would provide for a more compact form of development that would help to maximise benefits from infrastructural investment. By consolidating the zoning and helping to avoid unnecessary sprawl of the settlement, this alternative would increase the likelihood of brownfield development and contribute towards efforts to improve sustainable mobility (with associated effects on energy, air, noise and human health). Reducing unnecessary zoning would help to minimise sprawl and would avoid potential adverse environmental effects that would otherwise occur - this would benefit the protection of multiple environmental components.
	Alternative B: Less Compact **see note below**	By not consolidating land use zoning and including unnecessary land use zoning, this alternative would provide for a less compact form of development that would fail to maximise benefits from infrastructural investment. By facilitating the unnecessary sprawl of the settlement and failing to consolidate zoning, this alternative would decrease the likelihood of brownfield development and conflict with efforts to improve sustainable mobility (with associated effects on energy, air, noise and human health). Providing for unnecessary zoning would be likely to result in higher levels of sprawl and associated avoidable potential adverse environmental effects.

Town	Alternative (selected alternatives in **bold**)	Commentary
Clonmel Environs	**Alternative A: More Compact**	By consolidating land use zoning and reducing unnecessary land use zoning this alternative would provide for a more compact form of development that would help to maximise benefits from infrastructural investment. By consolidating the zoning and helping to avoid unnecessary sprawl of Clonmel Environs, this alternative would increase the likelihood of brownfield development and contribute towards efforts to improve sustainable mobility (with associated effects on energy, air, noise and human health). Reducing unnecessary zoning would help to minimise sprawl and would avoid potential adverse environmental effects that would otherwise occur - this would benefit the protection of multiple environmental components.
	Alternative B: Less Compact	By not consolidating land use zoning and including unnecessary land use zoning, this alternative would provide for a less compact form of development that would fail to maximise benefits from infrastructural investment. By facilitating the unnecessary sprawl of the Clonmel Environs and failing to consolidate zoning, this alternative would decrease the likelihood of brownfield development and conflict with efforts to improve sustainable mobility (with associated effects on energy, air, noise and human health). Providing for unnecessary zoning would be likely to result in higher levels of sprawl and associated avoidable potential adverse environmental effects.
Tramore	Alternative A: More Compact **see note below**	By consolidating land use zoning and reducing unnecessary land use zoning this alternative would provide for a more compact form of development that would help to maximise benefits from infrastructural investment. By consolidating the zoning and helping to avoid unnecessary sprawl of the settlement, this alternative would increase the likelihood of brownfield development and contribute towards efforts to improve sustainable mobility (with associated effects on energy, air, noise and human health). Reducing unnecessary zoning would help to minimise sprawl and would avoid potential adverse environmental effects that would otherwise occur - this would benefit the protection of multiple environmental components.
	Alternative B: Less Compact **see note below**	By not consolidating land use zoning and including unnecessary land use zoning, this alternative would provide for a less compact form of development that would fail to maximise benefits from infrastructural investment. By facilitating the unnecessary sprawl of the settlement and failing to consolidate zoning, this alternative would decrease the likelihood of brownfield development and conflict with efforts to improve sustainable mobility (with associated effects on energy, air, noise and human health). Providing for unnecessary zoning would be likely to result in higher levels of sprawl and associated avoidable potential adverse environmental effects.
Dunmore East	**Alternative A: More Compact**	By consolidating land use zoning and reducing unnecessary land use zoning this alternative would provide for a more compact form of development that would help to maximise benefits from infrastructural investment. By consolidating the zoning and helping to avoid unnecessary sprawl of the settlement, this alternative would increase the likelihood of brownfield development and contribute towards efforts to improve sustainable mobility (with associated effects on energy, air, noise and human health). Reducing unnecessary zoning would help to minimise sprawl and would avoid potential adverse environmental effects that would otherwise occur - this would benefit the protection of multiple environmental components.
	Alternative B: Less Compact	By not consolidating land use zoning and including unnecessary land use zoning, this alternative would provide for a less compact form of development that would fail to maximise benefits from infrastructural investment. By facilitating the unnecessary sprawl of the settlement and failing to consolidate zoning, this alternative would decrease the likelihood of brownfield development and conflict with efforts to improve sustainable mobility (with associated effects on energy, air, noise and human health). Providing for unnecessary zoning would be likely to result in higher levels of sprawl and associated avoidable potential adverse environmental effects.
Portlaw	**Alternative A: More Compact**	By consolidating land use zoning and reducing unnecessary land use zoning this alternative would provide for a more compact form of development that would help to maximise benefits from infrastructural investment. By consolidating the zoning and helping to avoid unnecessary sprawl of the settlement, this alternative would increase the likelihood of brownfield development and contribute towards efforts to improve sustainable mobility (with associated effects on energy, air, noise and human health). Reducing unnecessary zoning would help to minimise sprawl and would avoid potential adverse environmental effects that would otherwise occur - this would benefit the protection of multiple environmental components.
	Alternative B: Less Compact	By not consolidating land use zoning and including unnecessary land use zoning, this alternative would provide for a less compact form of development that would fail to maximise benefits from infrastructural investment. By facilitating the unnecessary sprawl of the settlement and failing to consolidate zoning, this alternative would decrease the likelihood of brownfield development and conflict with efforts to improve sustainable mobility (with associated effects on energy, air, noise and human health). Providing for unnecessary zoning would be likely to result in higher levels of sprawl and associated avoidable potential adverse environmental effects.
Lismore	**Alternative A: More Compact**	By consolidating land use zoning and reducing unnecessary land use zoning this alternative would provide for a more compact form of development that would help to maximise benefits from infrastructural investment. By consolidating the zoning and helping to avoid unnecessary sprawl of the settlement, this alternative would increase the likelihood of brownfield development and contribute towards efforts to improve sustainable mobility (with associated effects on energy, air, noise and human health). Reducing unnecessary zoning would help to minimise sprawl and would avoid potential adverse environmental effects that would otherwise occur - this would benefit the protection of multiple environmental components.
	Alternative B: Less Compact	By not consolidating land use zoning and including unnecessary land use zoning, this alternative would provide for a less compact form of development that would fail to maximise benefits from infrastructural investment. By facilitating the unnecessary sprawl of the settlement and failing to consolidate zoning, this alternative would decrease the likelihood of brownfield development and conflict with efforts to improve sustainable mobility (with associated effects on energy, air, noise and human health). Providing for unnecessary zoning would be likely to result in higher levels of sprawl and associated avoidable potential adverse environmental effects.

Town	Alternative (selected alternatives in **bold**)	Commentary
Gaeltacht na nDéise	**Alternative A: More Compact**	By consolidating land use zoning and reducing unnecessary land use zoning this alternative would provide for a more compact form of development that would help to maximise benefits from infrastructural investment. By consolidating the zoning and helping to avoid unnecessary sprawl of the Gaeltacht na nDéise, this alternative would increase the likelihood of brownfield development and contribute towards efforts to improve sustainable mobility (with associated effects on energy, air, noise and human health). Reducing unnecessary zoning would help to minimise sprawl and would avoid potential adverse environmental effects that would otherwise occur - this would benefit the protection of multiple environmental components.
	Alternative B: Less Compact	By not consolidating land use zoning and including unnecessary land use zoning, this alternative would provide for a less compact form of development that would fail to maximise benefits from infrastructural investment. By facilitating the unnecessary sprawl of the Gaeltacht na nDéise and failing to consolidate zoning, this alternative would decrease the likelihood of brownfield development and conflict with efforts to improve sustainable mobility (with associated effects on energy, air, noise and human health). Providing for unnecessary zoning would be likely to result in higher levels of sprawl and associated avoidable potential adverse environmental effects.

4.8 Reasons for Selecting Chosen Alternatives

Selected alternatives for the Plan from each of the various types of alternatives that emerged from the planning/SEA process are indicated above.

These alternatives have been incorporated into the Plan having regard to both:

1. The environmental effects which are identified by the SEA and are detailed above; and
2. Planning - including social and economic - effects.

Section 5 Summary of Effects arising from Plan

5.1 Overall Effects

Table 5.1 summarises the overall environmental effects arising from Plan provisions. The effects encompass all in-combination/cumulative effects arising from implementation of the Plan. The potentially significant adverse environmental effects (if unmitigated) arising from implementation of the Plan are detailed as are residual effects, taking into account mitigation through both provisions integrated into the Plan – see summary at Section 6.

5.2 Instances whereby Environmental Considerations were not integrated into the Plan

The Plan, considered as a whole, contributes towards environmental protection and management and sustainable development and complies with various legislative requirements. This is identified throughout the SEA documentation.

Various Plan provisions that would contribute towards the sustainable development of the County would, at the same time, have the potential to conflict with the environment, were mitigation measures not taken into account. This is normal and mitigation measures have been integrated into the Plan to deal with these potential effects.

However, a number of alterations were adopted by the Elected Members as part of the Plan that are particularly internally inconsistent with the overall approach provided for by the Plan and were advised against by the Plan-preparation SEA process. Advice provided on the environmental consequences of these alterations included:

> Taking into account higher-level planning objectives, these alterations are not justified and it would not provide the most evidence-based framework for development. These alterations would not be consistent with established population targets and/or the proper planning and sustainable development of the County. As a result they would present additional, unnecessary and potentially significant adverse effects on various environmental components, including soil, water, biodiversity, air and climatic factors and material assets.
>
> For alterations relating to zoning, much of the zoning proposed is considered to be premature in the context of current population targets.
>
> Potentially significant adverse unnecessary effects, would be likely to include:
> - Effects on non-designated habitats and species
> - Loss of an extent of soil function arising from the replacement of semi-natural land covers with artificial surfaces
> - Increased loadings on water bodies
> - Conflict with efforts to maximise sustainable compact growth and sustainable mobility
> - Occurrence of adverse visual impacts
>
> Where such alterations are further from the centre of settlements, potentially significant unnecessary adverse effects would be likely to include:
> - Difficulty in providing adequate and appropriate waste water treatment as a result of zoning outside of established built development envelopes of settlements (At An Rinn, in particular, the Council have identified major network capacity issues and that pump station and network upgrades are required to deal with current loading)
> - Adverse impacts upon the economic viability of providing for public assets and infrastructure
> - Adverse impacts upon carbon emission reduction targets in line with local, national and European environmental objectives
> - Conflicts between transport emissions, including those from cars, and air quality
> - Conflicts between increased frequency of noise emissions and protection of sensitive receptors
> - Potential effects on human health as a result of potential interactions with environmental vectors

Table 5.1 Overall Evaluation – Effects arising from the Plan

Environmental Component	Environmental Effects, in combination with the wider planning framework Effects include in-combination effects that are planned for through the wider planning framework including the NPF and associated NDP 2018, the Southern RSES, adjacent Development Plans and lower-tier land use plans.		
	Significant Positive Effect, likely to occur	**Potentially Significant Adverse Environmental Effects, if unmitigated**	**Likely Residual Adverse Non-Significant Effects**
Biodiversity and Flora and Fauna	• Contribution towards protection of ecology (including designated sites, ecological connectivity, habitats) by facilitating development of lands (including those within and adjacent to the City and County settlements) that have relatively low levels of environmental sensitivities and are served (or can be more easily served) by infrastructure and services, thereby helping to avoid the need to develop more sensitive, less well-serviced lands elsewhere in the City and County and beyond. • Contribution towards the maintenance of existing green infrastructure and associated ecosystem services, listed species, ecological connectivity and non-designated habitats. • Contribution towards protection and/or maintenance of biodiversity and flora and fauna by contributing towards the protection of natural capital including the environmental vectors of air, water and soil. Biodiversity and flora and fauna includes biodiversity in designated sites (including European Sites and Wildlife Sites) and Annexed habitats and species (including birds and bats), listed/protected species, ecological connectivity and non-designated habitats (including terrestrial and aquatic habitats), and disturbance to biodiversity and flora and fauna – including terrestrial and aquatic biodiversity and flora and fauna. • Sustains 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.	Arising from both construction and operation of development and associated infrastructure: • Loss of/damage to biodiversity in designated sites (including European Sites and Wildlife Sites) and Annexed habitats and species, listed species, ecological connectivity and non-designated habitats; and disturbance to biodiversity and flora and fauna; • Habitat loss, fragmentation and deterioration, including patch size and edge effects; and • Disturbance (e.g. due to noise and lighting along transport corridors) and displacement of protected species such as birds and bats.	• Loss of an extent of non-protected habitats and species arising from the replacement of semi-natural land covers with artificial surfaces. • Losses or damage to ecology (these would be in compliance with relevant legislation).
Population and Human Health	• Promotion of economic growth to encourage retention of working age population and funding of sustainable development and environmental protection and management. • Contribution towards appropriate provision of infrastructure and services to existing population and planned growth by facilitating compact development of lands (including those within and adjacent to the City and County settlements) that are served (or can be more easily served) by infrastructure and services, thereby helping to avoid the need to develop less well-serviced lands elsewhere in the City and County and beyond. • Contribution towards the protection of human health by facilitating development of lands (including those within and adjacent to the City and County settlements) that have relatively low levels of environmental sensitivities and are served (or can be more easily served) by infrastructure and services, thereby helping to avoid the need to develop more sensitive, less well-serviced lands elsewhere in the City and County and beyond. • Contributes towards protection of human health as a result of contributing towards the protection of natural capital including environmental vectors, including air and water.	• Potential adverse effects arising from flood events. • Potential interactions if effects arising from environmental vectors.	• Potential interactions with residual effects on environmental vectors – please refer to residual adverse effects under “Soil”, “Water” and “Air and Climatic Factors” below.

Environmental Component	Environmental Effects, in combination with the wider planning framework Effects include in-combination effects that are planned for through the wider planning framework including the NPF and associated NDP 2018, the Southern RSES, adjacent Development Plans and lower-tier land use plans.		
	Significant Positive Effect, likely to occur		**Significant Positive Effect, likely to occur**
Soil	• Contribution towards the protection of soils (including those used for agriculture) and designated sites of geological heritage by facilitating development of lands (including those within and adjacent to the City and County settlements) that have relatively low levels of environmental sensitivities and are served (or can be more easily served) by infrastructure and services, thereby helping to avoid the need to develop more sensitive, less well-serviced lands elsewhere in the City and County and beyond. • Contribution towards the protection of the environment from contamination the highest standards of remediation, and where appropriate to consultations with the EPA and other relevant bodies, will be required to resolve any instances of environmental pollution created by contaminated land.	• Potential adverse effects on the hydrogeological and ecological function of the soil resource, including as a result of development on contaminated lands. • Potential for riverbank and coastal erosion.	• Loss of an extent of soil function arising from the replacement of semi-natural land covers with artificial surfaces. • Riverbank and coastal erosion will continue to occur naturally over time and is likely to be enhanced by climate change.
Water	• Contribution towards the protection of water by facilitating development of lands (including those within and adjacent to the City and County settlements) that have relatively low levels of environmental sensitivities and are served (or can be more easily served) by infrastructure and services, thereby helping to avoid the need to develop more sensitive, less well-serviced lands elsewhere in the City and County and beyond. • Contributions towards the protection of water resources including the status of surface and groundwaters and water-based designations. • Contribution towards flood risk management and appropriate drainage.	• Potential adverse effects upon the status of water bodies and entries to the WFD Register of Protected Areas (ecological and human value), arising from changes in quality, flow and/or morphology. • Increase in flood risk and associated effects associated with flood events.	• Any increased loadings as a result of development to comply with the River Basin Management Plan. • Flood related risks remain due to uncertainty with regard to extreme weather events – however such risks will be mitigated by measures that have been integrated into the Plan.
Material Assets	• Contribution towards appropriate provision of infrastructure and services to existing population and planned growth by facilitating compact development of lands (including those within and adjacent to the City and County settlements) that are served (or can be more easily served) by infrastructure and services, thereby helping to avoid the need to develop less well-serviced lands elsewhere in the City and County and beyond. • Contribution towards compliance with national and regional water services and waste management policies. • Contribution towards increase in renewable energy use by facilitating renewable energy and electricity transmission infrastructure developments. • Contribution towards limits in increases in energy demand from the transport sector by facilitating sustainable compact growth. • Contribution towards reductions in average energy consumption per capita including promoting sustainable compact growth, sustainable mobility, sustainable design and energy efficiency.	• Failure to provide adequate and appropriate waste water treatment (water services infrastructure and capacity ensures the mitigation of potential conflicts). • Failure to adequately treat surface water run-off that is discharged to water bodies (water services infrastructure and capacity ensures the mitigation of potential conflicts). • Failure to comply with drinking water regulations and serve new development with adequate drinking water (water services infrastructure and capacity ensures the mitigation of potential conflicts). • Increases in waste levels. • Potential impacts upon public assets and infrastructure. • Interactions between agriculture and soil, water, biodiversity and human health - including phosphorous and nitrogen deposition as a result of agricultural activities and the production of secondary inorganic particulate matter.	• Exceedance of capacity in critical infrastructure risks remain, including due to uncertainty with regard to climate – however, such risks will be mitigated by: measures, including those requiring the timely provision of critical infrastructure, and compliance with the Water Framework Directive and associated River Basin Management Plan. • Residual wastes to be disposed of in line with higher-level waste management policies. • Any impacts upon public assets and infrastructure to comply with statutory planning/consent-granting framework.

Environmental Component	Environmental Effects, in combination with the wider planning framework Effects include in-combination effects that are planned for through the wider planning framework including the NPF and associated NDP 2018, the Southern RSES, adjacent Development Plans and lower-tier land use plans.		
	Significant Positive Effect, likely to occur	**Potentially Significant Adverse Environmental Effects, if unmitigated**	**Likely Residual Adverse Non-Significant Effects**
Air and Climatic Factors	• Contribution towards climate mitigation and adaptation by facilitating compact development of lands (including those within and adjacent to the City and County settlements) that are served (or can be more easily served) by infrastructure and services, thereby helping to avoid the need to develop less well-serviced lands elsewhere in the City and County and beyond. • In combination with other plans, programmes etc., contribution towards the objectives of the wide policy framework relating to climate mitigation and adaptation, and associated contribution towards maintaining and improving air quality and managing noise levels, including through measures relating to: o Sustainable compact growth; o Sustainable mobility, including walking, cycling and public transport; o Drainage, flood risk management and resilience; o Sectors including agriculture, forestry, energy and buildings; and o Sustainable design, energy efficiency and green infrastructure.	• Potential conflict between development under the Plan and aiming to reduce carbon emissions in line with local, national and European environmental objectives. • Potential conflicts between transport emissions, including those from cars, and air quality. • Potential conflicts between increased frequency of noise emissions and protection of sensitive receptors. • Potential conflicts with climate adaptation measures including those relating to flood risk management.	• An extent of travel related greenhouse gas and other emissions to air. This has been mitigated by provisions which have been integrated into the Plan, including those relating to sustainable compact growth and sustainable mobility. • Interactions between noise emissions and sensitive receptors. Various provisions have been integrated into the Plan to ensure that noise levels at sensitive receptors will be minimised.
Cultural Heritage	• Contributes towards protection of cultural heritage elsewhere in the City and County by facilitating development within existing settlements. • Contributes towards protection of cultural heritage within existing settlements by facilitating brownfield development and regeneration.	• Potential effects on protected and unknown archaeology and protected architecture arising from construction and operation activities.	• Potential effects on known architectural and archaeological heritage and unknown archaeology however, these will occur in compliance with legislation.
Landscape	• Contributes towards protection of wider landscape and landscape designations by facilitating development within existing settlements.	• Occurrence of adverse visual impacts and conflicts with the appropriate protection of designations relating to the landscape.	• Landscapes will change overtime as a result of natural changes in vegetation cover combined with new developments that will occur in compliance with the Plan's landscape protection measures.

Section 6 Mitigation and Monitoring Measures

6.1 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 Plan. Various environmental sensitivities and issues have been communicated to the Council through the SEA, Appropriate Assessment (AA) and Strategic Flood Risk Assessment (SFRA) processes. By integrating all related recommendations into the Plan, the Council have ensured that both the beneficial environmental effects of implementing the Plan have been and will be maximised and that potential adverse effects have been and will be avoided, reduced or offset.

Mitigation was achieved through the:

- Strategic work undertaken by the Council to ensure contribution towards environmental protection and sustainable development[14];
- Considering alternatives for the Plan[15];
- Integration of environmental considerations into zoning provisions of the Plan[16]; and
- Integration of individual SEA, AA and SFRA provisions into the text of the Plan.

6.2 Monitoring

The SEA Directive requires that the significant environmental effects of the implementation of plans and programmes are monitored. Monitoring is based around indicators that allow quantitative measures of trends and progress over time relating to the Strategic Environmental Objectives identified at Table 3.1 and used in the evaluation. Monitoring indicators, targets, sources and remedial action is provided at Table 6.1 overleaf.

[14] Far in advance of both the submission of the pre-Draft Plan to the Elected Members for approval and the placing of the Draft Plan on public display, Waterford City and County Council undertook various works in order to inform the preparation of the Plan.

The findings of this strategic work have been integrated into the Plan and will contribute towards both environmental protection and management and sustainable development within the County.

Strategic work undertaken by the Council includes background work in relation to Plan Strategies and other provisions for a variety of sectors, including:

- Economy, Tourism, Education and Retail;
- Transport and Mobility;
- Utilities Infrastructure, Energy and Communication;
- Housing and Sustainable Communities;
- Placemaking;
- Climate Action, Biodiversity and Environment;
- Landscape, Coast/ Marine and Blue Green Infrastructure; and
- Heritage.

[15] Although strategic alternatives in relation to the content of the Plan were significantly limited for the Plan (see Section 4), as part of the Plan preparation/SEA process, the Council considered a number of alternatives for the Plan. These alternatives were assessed by the SEA process and the findings of this assessment informed the selection of preferred alternatives, facilitating an informed choice with respect to the type of Plan that was prepared and placed on public display.

[16] Environmental considerations were integrated into the Plan's zoning through an interdisciplinary approach. Zoning has been applied in a way that primarily seeks to achieve sustainable and compact growth, taking into account the various requirements set out in the higher-level NPF and Southern RSES. The detailed Plan preparation process undertaken by the Planning Department combined with specialist seeks to facilitate zoning that will help to avoids inappropriate development being permitted in areas of elevated sensitivity, such as in areas at risk of flooding or ecological sensitivity. Various provisions have been integrated into the Plan that provide for flood risk management and ecological protection and management at project level. Also taken into account were environmental sensitivities relating to ecology, cultural heritage, landscape and water, as well as the overlay mapping of environmental sensitivities.

Table 6.1 Indicators, Targets, Sources and Remedial Action

Environmental Component	Indicators	Targets	Sources	Remedial Action
Biodiversity, Flora and Fauna	• Condition of European sites	• Require all local level land use plans to include ecosystem services and green/blue infrastructure provisions in their land use plans and as a minimum, to have regard to the required targets in relation to the conservation of European sites, other nature conservation sites, ecological networks, and protected species • Implement and review, as relevant, County Heritage Plan 2017-2022	• DHLGH report of the implementation of the measures contained in the Habitats Directive - as required by Article 17 of the Directive (every 6 years). [17] • DHLGH National Birds Directive Monitoring Report for the under Article 12 (every 3 years) [18] • Consultations with the NPWS [19]	• Where condition of European sites is found to be deteriorating this will be investigated with the Regional Assembly and the DHLGH to establish if the pressures are related to Plan actions / activities. A tailored response will be developed in consultation with these stakeholders in such a circumstance.
	• Number of spatial plans that have included ecosystem services content, mapping and policy to protect ecosystem services when their relevant plans are either revised or drafted	• Require all local level land use plans to include ecosystem services and green/blue infrastructure provisions in their land use plans and as a minimum, to have regard to the required targets in relation to the conservation of European sites, other nature conservation sites, ecological networks, and protected species • Implement and review, as relevant, County Heritage Plan 2017-2022	• Internal review of local land use plans	• Review internal systems
	• SEAs and AAs as relevant for new Council policies, plans, programmes etc.	• Screen for and undertake SEA and AA as relevant for new Council policies, plans, programmes etc.	• Internal monitoring of preparation of local land use plans	• Review internal systems
	• Status of water quality in the City and County's water bodies	• Included under Water below	• Included under Water below	• Included under Water below
	• Compliance of planning permissions with Plan measures providing for the protection of Biodiversity and flora and fauna – see Chapter 9 "Climate Action, Biodiversity and Environment"	• For planning permission to be only granted when applications demonstrate that they comply with all Plan measures providing for the protection of biodiversity and flora and fauna – see Chapter 9 "Climate Action, Biodiversity and Environment"	• Internal monitoring of likely significant environmental effects of grants of permission	• Review internal systems
Population and Human Health	• Implementation of Plan measures relating to the promotion of economic growth as provided for by Chapter 4 "Economy, Tourism, Education and Retail"	• For review of progress on implementing Plan objectives to demonstrate successful implementation of measures relating to the promotion of economic growth as provided for by Chapter 4 "Economy, Tourism, Education and Retail" • By 2020 all citizens will have access to speeds of 30Mbps, and that 50% of citizens will be subscribing to speeds of 100Mbps (Also relevant to Material Assets)	• Internal review of progress on implementing Plan objectives • Consultations with DECC	• Review internal systems • Consultations with DECC
	• Number of spatial concentrations of health problems arising from environmental factors resulting from development permitted under the Plan	• No spatial concentrations of health problems arising from environmental factors as a result of implementing the Plan	• Consultations with the Health Service Executive and EPA	• Consultations with the Health Service Executive and EPA
	• Proportion of people reporting regular cycling / walking to school and work above 2016 CSO figures	• Increase in the proportion of people reporting regular cycling / walking to school and work above 2016 CSO figures	• CSO data • Monitoring of Waterford City and County Council's Climate Change Adaptation Strategy 2019-2024	• Where proportion of population shows increase in private car use above CSO 2016 figures, the Council will coordinate with the Regional Assembly, the DHLGH, DECC and NTA to develop a tailored response.
	• Number of spatial plans that include specific green infrastructure mapping	• Require all local level land use plans to include specific green infrastructure mapping	• Internal review of local land use plans	• Review internal systems

[17] Including confirmation with development management that the following impacts have been considered and including use of monitoring data, where available: biodiversity/habitat loss; nitrogen deposition impacts on Natura 2000 sites; recreational disturbance resulting from implementation of tourism and recreation policies and objectives particularly in riparian areas; biodiversity enhancement; and disturbance /visitor pressure impacts of recreation, amenity and tourism development.

[18] Including confirmation with development management that the following impacts have been considered and including use of monitoring data, where available: biodiversity/habitat loss; nitrogen deposition impacts on Natura 2000 sites; recreational disturbance resulting from implementation of tourism and recreation policies and objectives particularly in riparian areas; biodiversity enhancement; and disturbance /visitor pressure impacts of recreation, amenity and tourism development.

[19] Including confirmation with development management that the following impacts have been considered and including use of monitoring data, where available: biodiversity/habitat loss; nitrogen deposition impacts on Natura 2000 sites; recreational disturbance resulting from implementation of tourism and recreation policies and objectives particularly in riparian areas; biodiversity enhancement; and disturbance /visitor pressure impacts of recreation, amenity and tourism development.

Environmental Component	Indicators	Targets	Sources	Remedial Action
Soil (and Land)	• Proportion of population growth occurring on infill and brownfield lands compared to greenfield (also relevant to Material Assets)	• Maintain built surface cover nationally to below the EU average of 4% • In accordance with National Policy Objectives 3c of the National Planning Framework, a minimum of 30% of the housing growth targeted in any settlement is to be delivered within the existing built-up footprint of the settlement • To map brownfield and infill land parcels across the City and County	• EPA Geoportal • Compilation of greenfield and brownfield development for the DHLGH • AA/Screening for AA for each application	• Where the proportion of growth on infill and brownfield sites is not keeping pace with the targets set in the NPF and the RSES, the Council will liaise with the Regional Assembly to establish reasons and coordinate actions to address constraints to doing so.
	• Instances where contaminated material generated from brownfield and infill must be disposed of	• Dispose of contaminated material in compliance with EPA guidance and waste management requirements	• Internal review of grants of permission where contaminated material must be disposed of	• Consultations with the EPA and Development Management
	• Environmental assessments and AAs as relevant for applications for brownfield and infill development prior to planning permission	• Screen for and undertake environmental assessments and AA as relevant for applications for brownfield and infill development prior to planning permission	• Internal monitoring of grants of permission	• Review internal systems
Water	• Status of water bodies as reported by the EPA Water Monitoring Programme for the WFD	• Not to cause deterioration in the status of any surface water or affect the ability of any surface water to achieve 'good status' • Implementation of the objectives of the River Basin Management Plan	• EPA Monitoring Programme for WFD compliance	• Where water bodies are failing to meet at least good status this will be investigated with the DHLGH Water Section, the EPA Catchment Unit, the Regional Assembly and, as relevant, Irish Water to establish if the pressures are related to Plan actions / activities. A tailored response will be developed in consultation with these stakeholders in such a circumstance. • Where planning applications are rejected due to insufficient capacity in the WWTP or failure of the WWTP to meet Emission Limit Values, the Council will consider whether it is necessary to coordinate a response with the Regional Assembly, EPA and Irish Water to achieve the necessary capacity.
	• Number of incompatible developments permitted within flood risk areas	• Minimise developments granted permission on lands which pose - or are likely to pose in the future - a significant flood risk	• Internal monitoring of likely significant environmental effects of grants of permission	• Where planning applications are being permitted on flood zones, the Council will ensure that such grants are in compliance with the Flood Risk Management Guidelines and include appropriate flood risk mitigation and management measures.
Material Assets	• Programmed delivery of Irish Water infrastructure for all key growth towns in line with Irish Water Investment Plan and prioritisation programme to ensure sustainable growth can be accommodated • Number of new developments granted permission which can be adequately and appropriately served with waste water treatment over the lifetime of the Plan	• All new developments granted permission to be connected to and adequately and appropriately served by waste water treatment over the lifetime of the Plan • Where septic tanks are proposed, for planning permission to be only granted when applications demonstrate that the outfall from the septic tank will not – in- combination with other septic tanks– contribute towards any surface or ground water body not meeting the objective of good status under the Water Framework Directive • Facilitate, as appropriate, Irish Water in developing water and wastewater infrastructure • See also targets relating to greenfield and brownfield development of land under Soil and broadband under Population and Human Health	• Internal monitoring of likely significant environmental effects of grants of permission Consultations with the Irish Water • DHLGH in conjunction with Local Authorities	• Where planning applications are rejected due to insufficient capacity in the WWTP or failure of the WWTP to meet Emission Limit Values, the Council will consider whether it is necessary to coordinate a response with the Regional Assembly, EPA and Irish Water to achieve the necessary capacity.
	• Proportion of people reporting regular cycling / walking to school and work above 2016 CSO figures	• Increase in the proportion of people reporting regular cycling / walking to school and work above 2016 CSO figures	• CSO data • Monitoring of Waterford City and County Council's Climate Change Adaptation Strategy 2019-2024	• Where proportion of population shows increase in private car use above CSO 2016 figures, the Council will coordinate with the Regional Assembly, the DHLGH, DECC and NTA to develop a tailored response.

Environmental Component	Indicators	Targets	Sources	Remedial Action
Air	• Proportion of journeys made by private fossil fuel-based car compared to 2016 National Travel Survey levels of 74% • NO_x, SO_x, PM10 and PM2.5 as part of Ambient Air Quality Monitoring	• Decrease in proportion of journeys made by private fossil fuel-based car compared to 2016 National Travel Survey levels • Improvement in Air Quality trends, particularly in relation to transport related emissions of NO_x and particulate matter	• CSO data • Data from the National Travel Survey • EPA Air Quality Monitoring • Consultations with Department of Transport and Department of Environment, Climate and Communications	• Where proportion of population shows increase in private car use above CSO 2016 figures, Council will coordinate with the Regional Assembly, DHLGH, DECC and NTA to develop a tailored response. See also entry under Population and human health above
Climatic Factors	• Implementation of Plan measures relating to climate reduction targets	• For review of progress on implementing Plan objectives to demonstrate successful implementation of measures relating to climate reduction targets	• Internal monitoring of likely significant environmental effects of grants of permission	• Review internal systems
	• A competitive, low-carbon, climate-resilient and environmentally sustainable economy	• Contribute towards transition to a competitive, low-carbon, climate-resilient and environmentally sustainable economy by 2050	• Monitoring of Waterford City and County Council's Climate Change Adaptation Strategy 2019-2024 • EPA Annual National Greenhouse Gas Emissions Inventory reporting • Climate Action Regional Office • Consultations with DECC	• Where targets are not achieved, the Council will liaise with the Regional Assembly and the Eastern and Midlands Climate Action Regional Office to establish reasons and develop solutions.
	• Share of renewable energy in transport	• Contribute towards the target of the Renewable Energy Directive (2009/28/EC), for all Member States to reach a 10% share of renewable energy in transport by facilitating the development of electricity charging and transmission infrastructure, in compliance with the provisions of the Plan		
	• Carbon dioxide (CO_2) emissions across the electricity generation, built environment and transport sectors	• Contribute towards the target of aggregate reduction in carbon dioxide (CO_2) emissions of at least 80% (compared to 1990 levels) by 2050 across the electricity generation, built environment and transport sectors		
	• Energy consumption, the uptake of renewable options and solid fuels for residential heating	• To promote reduced energy consumption and support the uptake of renewable options and a move away from solid fuels for residential heating		
	• Proportion of journeys made by private fossil fuel-based car compared to 2016 levels	• Decrease in the proportion of journeys made by residents of the City and County using private fossil fuel-based car compared to 2016 levels	• CSO data • Monitoring of Waterford City and County Council's Climate Change Adaptation Strategy 2019-2024	• Where trends toward carbon reduction are not recorded, the Council will liaise with the Regional Assembly and the Eastern and Midlands Climate Action Regional Office to establish reasons and develop solutions.
	• Proportion of people reporting regular cycling / walking to school and work above 2016 CSO figures	• Increase in the proportion of people reporting regular cycling / walking to school and work above 2016 CSO figures	• CSO data • Monitoring of Waterford City and County Council's Climate Change Adaptation Strategy 2019-2024	• Where proportion of population shows increase in private car use above CSO 2016 figures, the Council will coordinate with the Regional Assembly, the DHLGH, DECC and NTA to develop a tailored response.
Cultural Heritage	• Percentage of entries to the Record of Monuments and Places, and the context these entries within the surrounding landscape where relevant, protected from adverse effects resulting from development which is granted permission under the Plan	• Protect entries to the Record of Monuments and Places, and the context of these entries within the surrounding landscape where relevant, from adverse effects resulting from development which is granted permission under the Plan	• Internal monitoring of likely significant environmental effects of grants of permission	• Where monitoring reveals visitor pressure is causing negative effects on key tourist features along these routes, the Council will work with Regional Assembly, Fáilte Ireland and other stakeholders to address the pressures through additional mitigation tailored to the plans.
	• Percentage of entries to the Record of Protected Structures and Architectural Conservation Areas and their context protected from significant adverse effects arising from new development granted permission under the Plan	• Protect entries to the Record of Protected Structures and Architectural Conservation Areas and their context from significant adverse effects arising from new development granted permission under the Plan	• Consultation with DHLGH	
Landscape	• Number of developments permitted that result in avoidable adverse visual impacts on the landscape, especially with regard to landscape and amenity designations included in Land Use Plans, resulting from development which is granted permission under the Plan	• No developments permitted which result in avoidable adverse visual impacts on the landscape, especially with regard to landscape and amenity designations included in Land Use Plans, resulting from development which is granted permission under the Plan	• Internal monitoring of likely significant environmental effects of grants of permission	• Where monitoring reveals developments permitted which result in avoidable adverse visual impacts on the landscape, the Council will re-examine Plan provisions and the effectiveness of their implementation