

ENVIRONMENTAL REPORT

OF THE
BRAY ENVIRONS LOCAL AREA PLAN 2009-2015
STRATEGIC ENVIRONMENTAL ASSESSMENT



For: Wicklow County Council

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List of Abbreviations

CSO	Central Statistics Office
DEHLG	Department of the Environment, Heritage and Local Government
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
EU	European Union
GSI	Geological Survey of Ireland
NHA	Natural Heritage Area
NIAH	National Inventory of Architectural Heritage
NSS	National Spatial Strategy
RBD	River Basin District
RMP	Record of Monuments and Places
RPS	Record of Protected Structures
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SEO	Strategic Environmental Objective
SI No.	Statutory Instrument Number
SPA	Special Protection Area
WFD	Water Framework Directive

Glossary

Biodiversity and Flora and Fauna

Biodiversity is the variability among living organisms from all sources including inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems' (United Nations Convention on Biological Diversity 1992).

Flora is all of the plants found in a given area.

Fauna is all of the animals found in a given area.

Biotic Index Values (Q Values)

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

Environmental Problems

Annex I of Directive 2001/42/EC of the European Parliament and of the Council of Ministers, of 27 June 2001, on the assessment of the effects of certain plans and programmes on the environment (the Strategic Environmental Assessment Directive) requires that information is provided on 'any existing environmental problems which are relevant to the plan or programme', thus, helping to ensure that the proposed strategic action does not make existing environmental problems worse.

Environmental problems arise where there is a conflict between current environmental conditions and ideal targets. If environmental problems are identified at the offset they can help focus attention on important issues and geographical areas where environmental effects of the plan or programme may be likely.

Environmental Vectors

Environmental vectors are 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.

Mitigate

To make or become less severe or harsh

Mitigation Measures

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

Protected Structure

Protected Structure is the term used in the Planning Act of 2000 to define a structure included by a planning authority in its Record of Protected Structures. Such a structure shall not be altered or demolished in whole or part without obtaining planning permission or confirmation from the planning authority that the part of the structure to be altered is not protected.

Recorded Monument

A monument included in the list and marked on the map which comprises the Record of Monuments and Places that is set out county by county under Section 12 of the National Monuments (Amendment) Act, 1994 by the Archaeological Survey of Ireland. The definition includes Zones of Archaeological Potential in towns and all other monuments of archaeological interest which have so far been identified. Any works at or in relation to a recorded monument requires two months notice to the Department of the Environment, Heritage and Local Government under section 12 of the National Monuments (Amendment) Act, 1994.

Scoping

Scoping is the process of determining what issues are to be addressed, and setting out a methodology in which to address them in a structured manner appropriate to the plan or programme. Scoping is carried out in consultation with the appropriate bodies.

Strategic Actions

Strategic actions include: *Policies*, which may be considered as inspiration and guidance for action and which set the framework for plans and programmes; *Plans*, sets of co-ordinated and timed objectives for the implementation of the policy; and, *Programmes*, sets of projects in a particular area.

Strategic Environmental Assessment (SEA)

Strategic Environmental Assessment (SEA) is the formal, systematic evaluation of the likely significant environmental effects of implementing a plan or programme before a decision is made to adopt it.

Strategic Environmental Objective (SEO)

Strategic Environmental Objectives (SEOs) are methodological measures which are developed from international, national and regional policies which generally govern environmental protection objectives and against which the environmental effects of the LAP can be tested. The SEOs are used as standards against which the objectives of the LAP can be evaluated in order to help identify areas in which significant adverse impacts are likely to occur, if not mitigated.

Section 1 SEA Introduction and Background

1.1 Introduction and Terms of Reference

This is the Environmental Report of the Bray Environs Local Area Plan 2009-2015 Strategic Environmental Assessment (SEA). The purpose of the report is to provide a clear understanding of the likely environmental consequences of decisions regarding the future accommodation of development in Bray Environs.

The SEA is carried out in order to comply with the provisions of the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (SI No. 436 of 2004) and in order to improve planning and environmental management of future development in Bray Environs. This report should be read in conjunction with the Local Area Plan.

1.2 SEA Definition

Environmental assessment is a procedure that ensures that the environmental implications of decisions are taken into account before the decisions are made. *Environmental Impact Assessment*, or EIA, is generally used for describing the process of environmental assessment which is limited to individual projects such as waste incinerators, housing developments or roads while *Strategic Environmental Assessment*, or SEA, is the term which has been given to the environmental assessment of plans, and other strategic actions, which help determine what kind of individual projects take place.

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 insure that these effects are appropriately addressed at the earliest appropriate stage of decision-making on a par with economic and social considerations.

The kind of development that occurs in Bray Environs and where it occurs will be significantly determined by the implementation of the Local Area Plan. By anticipating the effects and avoiding areas in which growth cannot be sustainably accommodated and by directing

development towards more compatible and robust receiving environments adverse effects of development are likely to be mitigated, planning applications are more likely to be granted permission and the scope of EIAs which may be required as part of certain planning applications are likely to be reduced.

1.3 Legislative Context

Directive 2001/42/EC of the European Parliament and of the Council of Ministers, of 27 June 2001, on the assessment of the effects of certain plans and programmes on the environment, referred to hereafter as the SEA Directive, introduced the requirement that SEA be carried out on plans and programmes which are prepared for a number of sectors, including land use planning. The SEA Directive was transposed into Irish Law through the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (Statutory Instrument Number (SI No.) 435 of 2004) and the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (SI No. 436 of 2004). Both sets of Regulations became operational on 21 July 2004.

1.4 Implications for Wicklow County Council and the Elected Members

The above legislation requires certain plans and programmes which are prepared by Wicklow County Council - including the Bray Environs Local Area Plan - to undergo SEA. The findings of the SEA are expressed in an Environmental Report which has been submitted to the Elected Members alongside the Plan. The Elected Members had to take account of the Environmental Report before the adoption of the Plan. On adoption of the Plan a statement was prepared and made public, summarising, inter alia: how environmental considerations have been integrated into the Plan; and, the reasons for choosing the Plan as adopted over other alternatives detailed in the Environmental Report.

Section 2 SEA Methodology

2.1 Introduction

This section details how the SEA for the Bray Environs Local Area Plan has been undertaken alongside the preparation of the Plan. The SEA

process started in July 2008 and this report has been produced in May 2009.

Figure 2.1 lays out the main stages in the Plan preparation/SEA process.

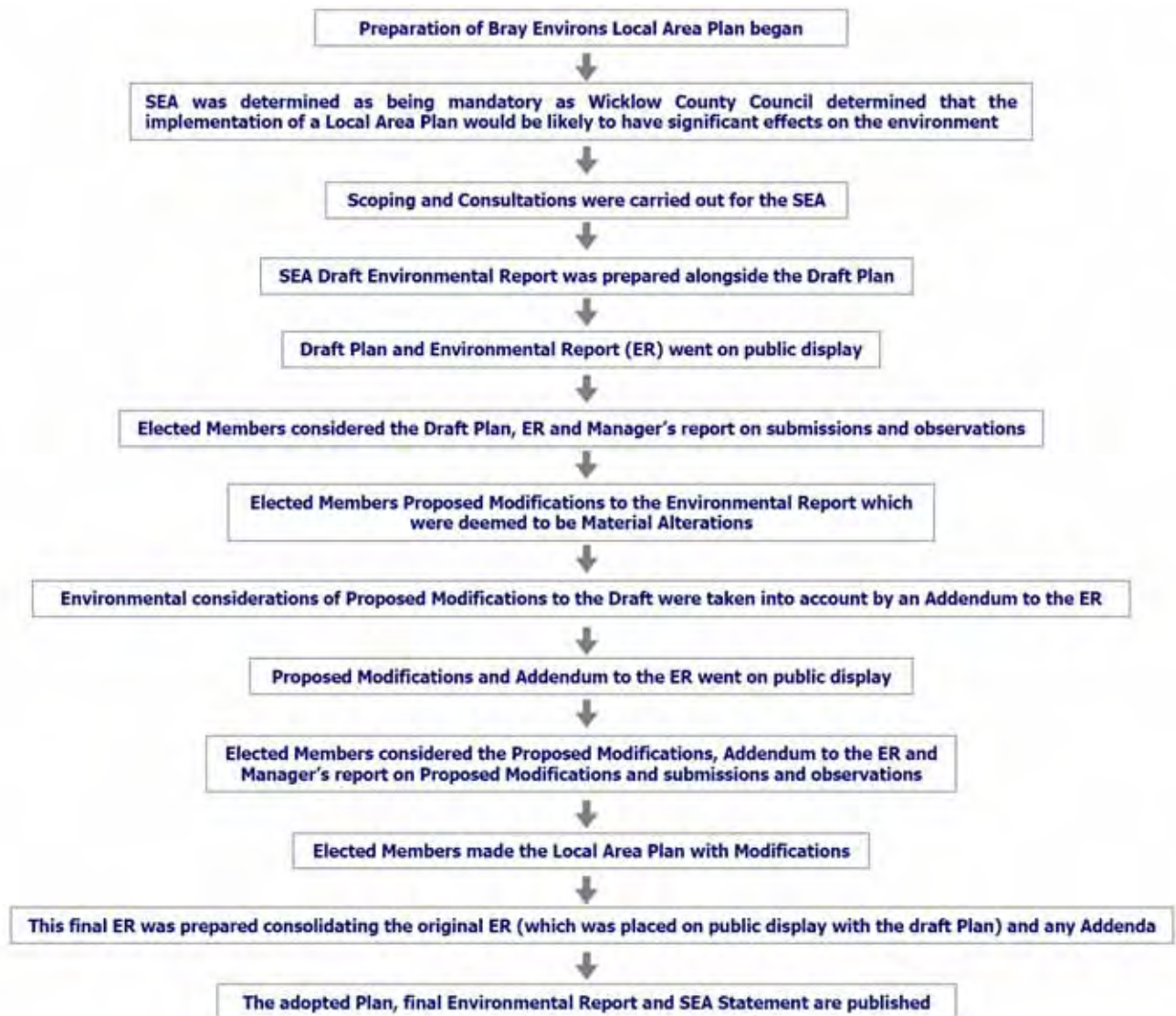


Figure 2.1 Local Area Plan Making and SEA Stages

2.2 Scoping

2.2.1 Introduction

In consultation with the relevant authorities, the scope of environmental issues to be dealt with by the SEA together with the level of detail to which they were to be addressed was broadly decided on after preliminary data collection. Scoping of the SEA was continuous with certain issues being selected for further examination after certain data was obtained. Scoping helped the SEA to become focused upon the important issues, such as those relating to existing and potential environmental issues and environmental problems¹, thereby avoiding resources being wasted on unnecessary data collection.

Scoping facilitated the selection of issues relevant to the environmental components which are specified under the SEA Directive - biodiversity, fauna, flora, population, human health, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, and landscape.

With regard to human health, impacts relevant to the SEA are those which arise as a result of interactions with 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). Impacts upon human beings arising as a result of social and economic conditions are not considered by SEA.

Consultations were held with: the Environmental Protection Agency (EPA); the Department of the Environment, Heritage and Local Government (DEHLG); and, the Department of

¹ Annex I of the SEA Directive requires that information is provided on 'any existing environmental problems which are relevant to the plan or programme', thus, helping to ensure that the proposed strategic action does not make existing environmental problems worse.

Environmental problems arise where there is a conflict between current environmental conditions and ideal targets. If environmental problems are identified at the offset they can help focus attention on important issues and geographical areas where environmental effects of the plan or programme may be likely.

Communications, Marine and Natural Resources².

The Bray Environs Plan area covers two parcels of land - one at Fassaroe to the west of Bray and the N11/M11 and one at Kilruddery - to the south of Bray and to the west of Bray Head.

2.2.2 Most Important Strategic Environmental Issues

The most important strategic environmental issues relating to the Fassaroe area were identified as follows:

- The existence of areas where known landfilling activity was carried out at the northern boundary of the area;
- An area of sloping land in the north of Fassaroe which is visually prominent;
- Five entries to the Record of Monument and Places (RMP) which are located within the Fassaroe area including Fassaroe Castle which was built in 1536. This suggests there may be other archaeological sites which could possibly be uncovered in the development process, especially as this is a greenfield site. Structures, including their curtilage, which have been protected for architectural reasons are also located within the Fassaroe area; and,
- Development in Bray Environs would lead to an increase in traffic and associated emissions. Noise radiating from the N11/M11 is also an issue.

The most important strategic environmental issues relating to the Kilruddery area are identified as follows:

- Certain lands in Kilruddery area which are located within an Area of Outstanding Natural Beauty and are adjacent to an area under consideration for a Special Amenity Area Order are visually prominent, making them sensitive to development; and,

² Note: Following the 2007 general election the Marine function of the Department of Communications, Marine and Natural Resources was transferred to the Department of Agriculture Food and Fisheries.

- The cultural heritage and historic importance of Kilruddery Estate could be cumulatively diminished by the continual selling of land facilitated by rezoning.

Common to both Fassaroe and Kilruddery is the need to: provide energy, transport, waste water collection and waste water treatment infrastructure in a timely and sufficient manner. The provision of timely and sufficient waste water treatment infrastructure will contribute to the protection of water quality.

Environmental considerations were communicated to the plan making team at Wicklow County Council on an ongoing basis from the outset in order to allow for their integration into the Plan thus minimising the potential for significant negative environmental effects arising from implementation of the Plan.

2.3 Environmental Baseline Data and Other Strategic Actions

The SEA process is informed by the environmental baseline (i.e. the current state of the environment - flora and fauna, soil, water, cultural heritage etc.) to facilitate: the identification and evaluation of the likely significant environmental effects of implementing the Plan and the alternatives; and, the subsequent monitoring of the effects of the Plan as adopted. Data was collected to describe the environmental baseline and its likely evolution without implementation of the Plan.

The SEA Directive requires that information is provided on 'any existing environmental problems which are relevant to the Plan or programme'. Information is therefore provided on existing environmental problems which are relevant to the Plan, thus helping to ensure that the Plan does not exacerbate any existing environmental problems in Bray Environs.

The SEA Directive requires that information on the baseline environment be focused upon the relevant aspects of the environmental characteristics of areas likely to be significantly affected and the likely evolution of the current environment in the absence of the strategic action i.e. the Plan. Any information that does not focus upon this is surplus to requirements; therefore the SEA focuses on the significant

issues, disregarding the less significant ones. In addition, the SEA Directive aims to avoid duplication of the assessment whereby a strategic action forms part of a hierarchy. Furthermore, if certain matters are more appropriately assessed at different levels of the hierarchy in which the Plan is positioned, or, if certain matters have already been assessed by a different level of the hierarchy then additional assessment is not needed.

In order to describe the baseline (the current state of the environment) in the Bray Environs Plan area, data was collated from currently available, relevant environmental sources.

2.4 Alternatives

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.

Taking into account the objectives and the geographical scope of the Plan, alternatives were formulated through consultation with the plan-making team for Wicklow County Council and a number of departments at the Council.

2.5 The SEA Environmental Report

In this Environmental Report, which was placed on public display alongside the Draft Plan, the likely environmental effects of the Plan and the alternatives are predicted and their significance evaluated with regard to the environmental baseline. The Environmental Report provided the decision-makers, the Elected Members of Wicklow County Council, who decided what type of Plan to adopt, as well as the public, with a clear understanding of the likely environmental consequences of decisions regarding the future accommodation of growth in Bray Environs. Mitigation measures to prevent or reduce significant adverse effects posed by the Plan, or to maximise any benefits arising, were recommended for integration into the Plan. The alternatives are also presented in this report, as are measures concerning monitoring.

The Environmental Report had to be updated in order to take account of changes which were

made to the Draft Plan after it was put on public display and before it was adopted.

2.6 The SEA Statement

On adoption of the Plan a document - referred to as the SEA Statement - was prepared and made public. This includes information on: how environmental considerations have been integrated into the Plan - highlighting the main changes to the Plan which resulted from the SEA process; how the Environmental Report and consultations have been taken into account - summarising the key issues raised in consultations and in the Environmental Report indicating what action, if any, was taken in response; and the reasons for choosing the Plan in the light of the other alternatives, identifying the other alternatives considered, commenting on their potential effects and explaining why the Plan was selected.

The SEA Statement includes information on how environmental considerations have been integrated throughout the process. It also describes how the preferred alternative was chosen to introduce accountability, credibility and transparency into the strategic decision-making process.

2.7 Legislative Conformance

This report complies with the provisions of the SEA Regulations and is written in accordance with Schedule 2B of the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (SI No. 436 of 2004).

Table 2.1 is a reproduction of the checklist of information to be contained in the Environmental Report (DEHLG, 2004)³ and includes the relevant sections of this report which deal with these requirements.

³ DEHLG (2004) *Implementation of SEA Directive (2001/42/EC): Guidelines for Regional Authorities and Planning Authorities* Dublin: Government of Ireland.

Information Required to be included in the Environmental Report	Corresponding Section of this Report
(A) Outline of the contents and main objectives of the Plan, and of its relationship with other relevant plans and programmes	Sections 4 and 5
(B) Description of relevant aspects of the current state of the environment and the evolution of that environment without implementation of the Plan	Section 3 and Appendix I
(C) Description of the environmental characteristics of areas likely to be significantly affected	Sections 3, 4, 7 and 8
(D) Identification of any existing environmental problems which are relevant to the Plan, particularly those relating to European protected sites	Section 3
(E) List environmental protection objectives, established at international, EU or national level, which are relevant to the Plan and describe how those objectives and any environmental considerations have been taken into account when preparing the Plan	Sections 4, 6, 7 and 9
(F) Describe the likely significant effects on the environment	Section 7 and 8
(G) Describe any measures envisaged to prevent, reduce and as fully as possible offset any significant adverse environmental effects of implementing the Plan	Section 9
(H) Give an outline of the reasons for selecting the alternatives considered, and a description of how the assessment was undertaken (including any difficulties)	Sections 2, 6 and 7
(I) A description of proposed monitoring measures	Section 10
(J) A non-technical summary of the above information	Appendix II
(K) Interrelationships between each Environmental topic	Addressed as it arises within each Section

Table 2.1 Checklist of Information included in this Environmental Report

2.8 Difficulties Encountered

2.8.1 Centralised Data Source

The lack of a centralised data source that could make all environmental baseline data for the Plan area both readily available and in a consistent format posed a significant difficulty to the SEA process. This difficulty is one which is encountered at local authorities across the country and was overcome by investing time in the collection of data from various sources and through the use of Geographical Information Systems.

2.8.2 Landfills

A number of areas exist within the Fassaroe part of the Plan area where known landfilling activity was carried out in the past. Although mapping indicating the location of these areas was prepared as part of the SEA process, there is uncertainty as to precisely where the landfill sites lie relative to zoning boundaries.

Risks relating to development within or in close proximity to these areas will be required to be mitigated before any development of these lands takes place (see Section 9.3.18).

Section 3 The Baseline Environment at Bray Environs

3.1 Introduction

The environmental baseline of Bray Environs is described in this section. This baseline together with the Strategic Environmental Objectives, which are outlined in Section 4, was used in order to identify, describe and evaluate the likely significant environmental effects of implementing the Local Area Plan (LAP) and the alternatives and in order to determine appropriate monitoring measures.

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

The Plan area consists of two parcels of land, one at Fassaroe to the west of Bray Town and the N11 and one at Kilruddery to the south of Bray Town.

The boundary of the Fassaroe site is guided by the Cookstown River to the south, a stream to the north and the N11 to the east of the Plan area. There are a number of land uses at the Fassaroe site including residential, the Greenstar recycling facility and the sand and gravel pit, Residential use is generally low in density. The remainder of the Plan Area generally consists of agricultural lands.

Lands at Kilruddery are dominated by the presence of Kilruddery House and Gardens. Land uses at this site include mainly agricultural use and woodlands. The lands are situated in a visually sensitive area at the foot of the Little Sugar Loaf, south of a housing estate and an industrial park along the R768.



Figure 3.1 Context of County Wicklow in relation to the island of Ireland



Figure 3.2 Context of the Plan area in relation to Bray and surrounding region



Figure 3.3 Photograph of the Plan area in relation to Bray and surrounding region

3.2 Biodiversity and Flora and Fauna

3.2.1 Overview of the Habitats

3.2.1.1 Introduction

Green space, which makes up the vast majority of both sites, consists of habitats and corridors for movement for a wide range of wildlife including various bird species, invertebrates such as bees and butterflies and mammals such as hedgehogs, mice, rats and foxes.

The River Dargle and the Cookstown River run adjacent to the Fassaroe site interacting with both the natural and built heritage to give a unique and distinct character as well as providing habitats for flora and fauna.

Broad leaved, coniferous and mixed forests as well as pastures at the Kilruddery site provide habitats for a number of species.

3.2.1.2 CORINE Land Cover Mapping⁴

The CORINE land cover mapping⁵ for the Bray Environs area for the year 2000 (see Figure 3.5) which classifies land cover indicates that *agricultural land* is the main type of land cover. This comprises semi-natural lands such as *pastures, non-irrigated arable lands and agricultural lands with natural vegetation, mixed forest and complex cultivation patterns*. There is a large area on the Fassaroe site which is classified as *dump* – this reflects its past use as a waste disposal site in the past.

⁴ CORINE Land Cover (CLC) is a map of the European environmental landscape based on interpretation of satellite images. Land cover is the observed physical cover, as seen from the ground or through remote sensing, including for example natural or planted vegetation, water and human constructions which cover the earth's surface. Because of the scale of the CORINE data and the method by which it was collected there are likely to be a number of inaccuracies at the local level. It is noted, however, that the land cover shown on the maps is generally accurate. The European Environment Agency, in conjunction with the European Space Agency, the European Commission and member countries is currently updating the CORINE land cover database.

⁵ European Environment Agency Coordination of Information on the Environment (2004) *Ireland's Corine Land Cover 2000 (CLC2000)* Copenhagen: EEA

A large portion of the Kilruddery site is made up of *non-irrigated arable land* with the remainder comprising *pasture, mixed forest and broad-leaved forest*.

Land cover categories which indicate lands that are likely to be valuable to biodiversity are illustrated on Figure 3.7. These lands comprise, inter alia, an area of mixed woodland at the southern boundary of the Fassaroe site, an area of broad leaved forest to the east of the Kilruddery site and an area of mixed woodlands to the south of that.

It is noted that some of these land covers have come about as a result of human interaction with the landscape, forest at Kilruddery Demesne was planted in the 18th century.

Land cover differences between the CORINE 1990 data (see Figure 3.4) and the data for the year 2000 (see Figure 3.5) are illustrated on Figure 3.6 and show no changes of land cover within the Fassaroe and Kilruddery. A large area of land to the north of the Kilruddery site has changed from *non-irrigated arable land* to *discontinuous urban fabric*.

3.2.2 Ecological Networks

Article 10 of the Habitats Directive recognises the importance of ecological networks as corridors and stepping stones for wildlife, including for migration, dispersal and genetic exchange of species of flora and fauna. The Directive requires that ecological connectivity and areas of ecological value outside the Natura 2000 network of designated ecological sites are maintained and it recognises the need for the management of these areas through land use planning and development policies. Ecological networks are important in connecting areas of local biodiversity with each other and with nearby designated sites so as to prevent islands of habitat from being isolated entities. Ecological networks are composed of linear features, such as treelines, hedgerows, rivers and canals, which provide corridors or stepping stones for wildlife species moving within their normal range. They are particularly important for mammals, especially for bats and small birds.

Within and surrounding the Plan area, the ecological networks are made up of components including the Cookstown River, the River Dargle and their tributaries and banks, the various woodlands and hedgerows within and

surrounding the Plan area and lands used for agriculture.

It is noted that the River Dargle Catchment (including the Countybrook, Cookstown and other tributaries) is one of the key salmonid systems on the east coast. The Dargle River is a designated Salmonid River (see Section 3.5.4.2).

These components provide habitats for flora and fauna and facilitate linkages for the flora and fauna both between and within designated ecological sites, the non-designated surrounding countryside of Bray Environs.

3.2.3 Designations

3.2.3.1 Introduction

There is one ecologically designated site within the Bray Environs Plan boundary. Ballyman Glen candidate Special Area of Conservation and proposed National Heritage Area (Site Code: 000713) lies along the northern Fassaroe site boundary and continues westwards outside the Plan area. Bray Environs has a number of designated sites in its vicinity. The Great Sugar Loaf pNHA (Site Code: 001769) and Kilmacanogue Marsh pNHA (Site Code: 000724) lie to the south of the Plan area. Bray Head pNHA and SAC (Site Code: 000714) is situated to the east. The Dargle River Valley pNHA (Site Code: 001745) lies south of the Fassaroe site. Powerscourt Woodland pNHA (Site Code: 001768) and Knocksink Wood pNHA and SAC (Site Code: 000725) are located to the west and southwest of the Fassaroe Plan area.

Some of these sites are mapped on Figure 3.8. The context of the Plan area in relation to the designated sites within this region of County Wicklow is shown on Figure 3.9.

It is noted that the majority of the ecological sensitivities discussed below – and associated potential for environmental impacts – occur at or beyond the fringes of the Plan area. They are included, however, to ensure that areas which could be impacted as a result of implementing the Plan are identified and assessed.

3.2.3.2 Special Areas of Conservation

Special Areas of Conservation (SACs) have been selected for protection under the European Council Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC) by the Department of the

Environment, Heritage and Local Government (DEHLG) due to their conservation value for habitats and species of importance in the European Union.

3.2.3.3 Natural Heritage Areas

Natural Heritage Areas (NHAs) are designated due to their national conservation value for ecological and/or geological/geomorphological heritage. They cover nationally important semi-natural and natural habitats, landforms or geomorphological features, wildlife plant and animal species or a diversity of these natural attributes. NHAs are designated under the Wildlife (Amendment) Act 2000. The sites are *proposed* sites because they are currently under consideration by the Commission of the European Union.

3.2.3.4 Designated Sites⁶

The following designated ecological sites are found within or adjacent to the Plan area:

- **Ballyman Glen cSAC and pNHA**

Ballyman Glen is situated approximately 3 km north of Enniskerry, just inside the northern Fassaroe boundary. It is orientated in an east-west direction with a stream running through the centre. The glen is bounded mostly by steeply sloping pasture with Gorse and areas of wood and scrub.

Areas of marsh are found in the wetter areas by the stream, particularly at the western end of the site. There is an area of broad-leaved woodland on the steeper southern slopes of the glen.

This site is a candidate SAC selected for habitats listed on Annex I of the EU Habitats Directive namely alkaline fen and petrifying springs.

Fens are rare in Wicklow/Dublin and this is one of only two sites in Wicklow for the Narrow-leaved Marsh-orchid.

On designation, this cSAC will become part of Natura 2000 - a network of protected areas throughout the EU established under the Habitats Directive.

⁶ Text in this section is taken from the National Parks and Wildlife Service's Site Synopses. Full Site Synopses for these designations can be found in Appendix I

Ballyman Glen cSAC and pNHA is mapped on Figure 3.8 and Figure 3.9.

- **Bray Head cSAC and pNHA**

This coastal site is situated in the north-east of Co. Wicklow between the towns of Bray and Greystones. Heath, a habitat listed on Annex I of the EU Habitats Directive, is the principal habitat over much of the Head. Bray Head is of high conservation importance as it has good examples of two habitats (sea cliffs and dry heath) listed on Annex I of the EU Habitats Directive. It also supports a number of rare plant species and has ornithological importance.

On designation, this cSAC will become part of Natura 2000.

Bray Head pNHA and cSAC is mapped on Figure 3.8 and Figure 3.9.

- **Knocksink Woods cSAC and pNHA**

Knocksink Wood is situated in the valley of the Glencullen River north-west of Enniskerry. The fast-flowing Glencullen River winds its way over granite boulders along the valley floor. The importance of this site lies in the diversity of woodland habitats which occur. The presence of rare or threatened plants and invertebrates adds to the interest. Much of this site has been designated a Statutory Nature Reserve and there is presently an educational centre within the site.

This cSAC will become part of Natura 2000 when designated.

Enniskerry Woods pNHA and cSAC is partially mapped on Figure 3.8 and can be seen in full on Figure 3.9.

- **Great Sugar Loaf pNHA**

The Great Sugar Loaf is situated about 5 kilometres southwest of Bray. It is a steep mountain, 501 meters above sea level, and has been modified greatly by glacial erosion. The site is of both ecological and geological interest, and is also a prominent feature in the landscape of north County Wicklow. Because of its ease of access and close proximity to large urban areas, the Great Sugar Loaf is a valuable educational and recreational asset.

The Great Sugar Loaf pNHA is mapped on Figure 3.8 and Figure 3.9.

- **Kilmacanogue Marsh pNHA**

This site is located at the base of the Great Sugarloaf, south of Kilmacanogue just off the main Dublin to Wexford road. A small stream links the site to the Great Sugarloaf pNHA. This site is important in having a diversity of species-rich wetland habitats within a relatively small area, and particularly for the presence of some rare invertebrates.

Kilmacanogue Marsh pNHA is mapped on Figure 3.8 and Figure 3.9.

- **Powerscourt Woodland pNHA**

Powerscourt Woodland is located about 2 km south-west of Enniskerry. It is largely contained within the two large demesnes of Powerscourt and Charleville, and includes a 4 km stretch of the Dargle River. The topography of the area is rolling hillside sloping down to the river. The site includes some parkland with large specimen trees. The well documented record of land management practices held by the demesnes adds to the scientific interest. The area is also of great educational value, being frequently used for teaching.

Powerscourt Woodland pNHA is partially mapped on Figure 3.8 and can be seen in full on Figure 3.9.

- **Dargle River Valley pNHA**

This site is located about 2 km south of Fassaroe. It is a section of the River Dargle with steep wooded banks. The importance of this site is that it is a fine example of a wooded valley. It is likely that this valley has been wooded for a long period and such habitats are becoming rare in north County Wicklow. The removal of the conifers would increase the interest of the site. The site is also of considerable geological importance.

The Dargle River Valley pNHA is mapped on Figure 3.8 and Figure 3.9.

3.2.3.5 Trees Considered for Preservation

There are two trees considered for preservation within the Plan area. These are located at Kilruddery Demesne and at the southern

Fassaroe site boundary along the Cookstown River. Outside of the Plan area, there are two other areas with trees considered for preservation. These locations are to the west of the Fassaroe site at Enniskerry and to the west of the N11 near Kilmacanogue. These locations are mapped on Figure 3.10.

Tree Preservation Orders (TPOs) enable local authorities to preserve any single tree or group of trees and brings them under planning control. TPOs are only made if it appears that a tree or group of trees need to be protected in the interests of amenity in the environment. The Planning and Development Act 2000 has further outlined the legal framework and procedures provided in the 1963 Act to make a TPO.

3.2.3.6 Special Amenity Area Orders

A Special Amenity Area Order for Bray Head was drawn up in 2007. Areas Considered for Special Amenity Area Order (SAAO) include the Dargle Glen, The Little Sugar Loaf, The Great Sugar Loaf. This is discussed further in Section 0.

3.2.3.7 Areas of Outstanding Natural Beauty

According to the Wicklow County Development Plan, the areas of Fassaroe, Giltspur and Kilruddery Demesne East are areas of outstanding natural beauty. Kilruddery Demesne East is classified as a corridor area. This is discussed further in Section 3.9.2.2.

3.2.3.8 Register of Protected Areas

In response to the requirements of the Water Framework Directive a number of water bodies or parts of water bodies which must have extra controls on their quality by virtue of how their waters are used by people and by wildlife have been listed on Registers of Protected Areas (see Section 3.5).

The Dargle River has been listed on the RPA for Habitat Rivers. This is discussed further in Section 3.5.3.4.

The waters listed on the RPA are mapped on Figure 3.23.

3.2.4 Existing Problems

Land cover differences between the CORINE 1990 data and the data for the year 2000 indicate a cumulative loss of agricultural areas which have natural vegetation and their

associated habitats - including their flora and fauna. The change of land cover north of the Kilruddery site to discontinuous urban fabric indicates what could be the beginning of a cumulative encroachment onto the Little Sugar Loaf.

At the Kilruddery site, an old oak forest mixed with non-native species lies to the south of the housing estate. Habitats may be threatened by the invasion of non-native species. These are species that have been introduced, generally by human intervention, outside their natural range and whose establishment and spread can threaten native ecosystems.

With regard to terrestrial flora and fauna, all greenfield development in the area will cause an impact - the replacement of natural and semi natural habitats with artificial surfaces results in loss of flora and fauna and therefore adversely impacts upon this environmental component.

3.2.5 Evolution of Biodiversity and Flora and Fauna in the absence of a Local Area Plan

In the absence of a Local Area Plan for Bray Environs development would have no guidance as to where to be directed and planning applications would be assessed on an individual basis with flora and fauna, habitats and ecological connectivity protected under a number of strategic actions relating to biodiversity and flora and fauna protection. The evolution of biodiversity and flora and fauna would be dependent on the rate and extent of any such developments which would take place and these developments would be considered with regard to the Wicklow County Development Plan 2004-2010. An LAP will contribute towards the occurrence of development in an appropriate and sustainable manner.

An LAP provides an opportunity to integrate the ecological protection measures required by the Habitats Directive with the planning or development management of vulnerable areas, which might not be presented in the absence of a LAP.

Any future development along the edges of designated ecological sites would be likely to result in a reduction in habitats and would

therefore be likely to reduce ecological connectivity on the edges of these sites.

Development along or adjacent to the banks of rivers could result in a reduction in ecological connectivity within and between these and other habitats.

Pollution of water bodies as a result of any future development along river catchments would be likely to adversely impact aquatic biodiversity and flora and fauna including salmonid species and other species protected under Annex II of the Habitats Directive. The status of the River Dargle which is listed on the Register of Protected Areas for *Habitats Rivers* and is a salmonid river could be compromised if pollution of the Cookstown River, a tributary of the Dargle, was to occur.

Beneficial effects upon biodiversity and flora and fauna which would be likely to arise out of the policies and objectives included in the LAP which are not included in the current Wicklow County Development Plan would not be likely without the implementation of the Plan.

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

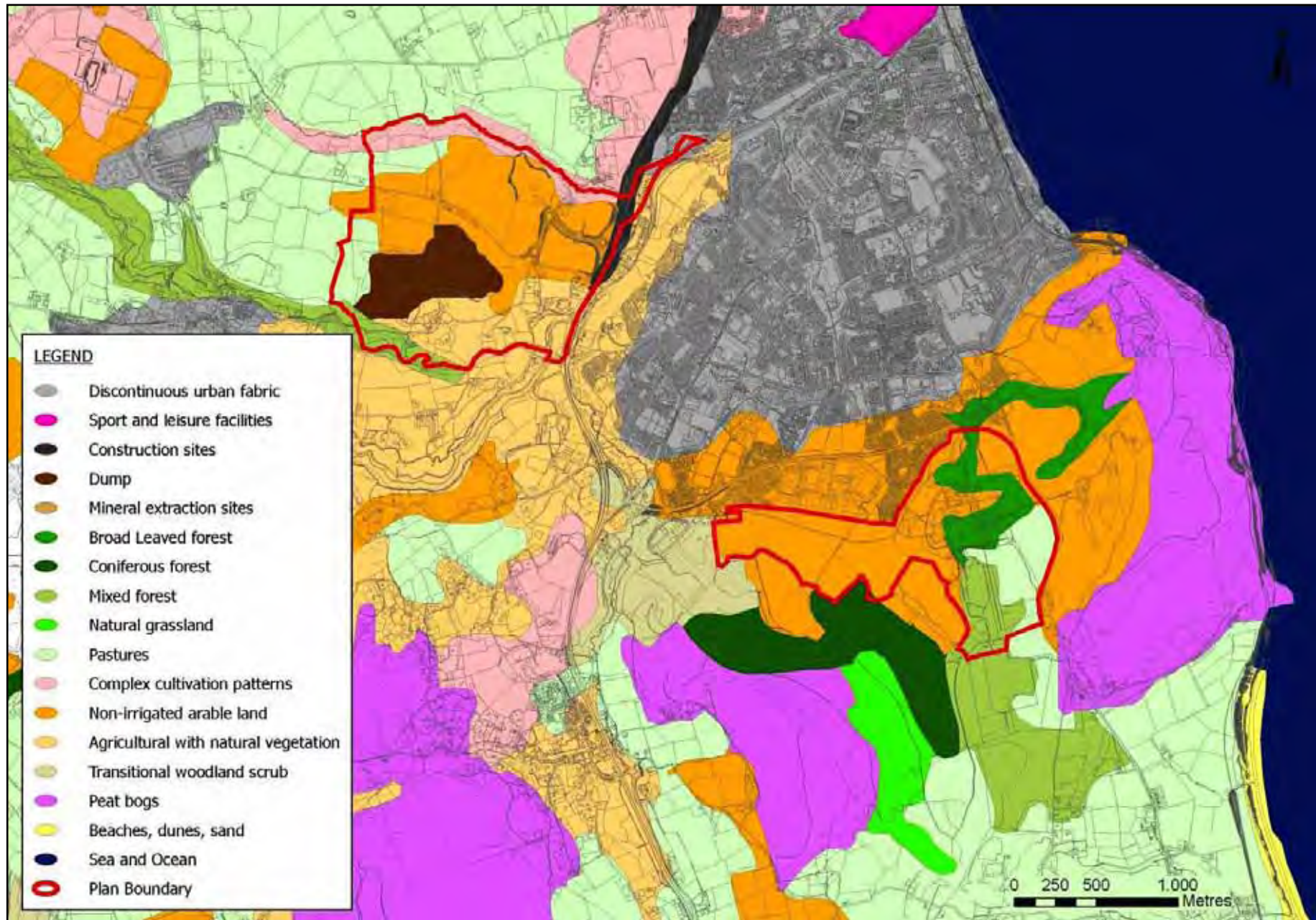


Figure 3.4 CORINE Land Cover 1990

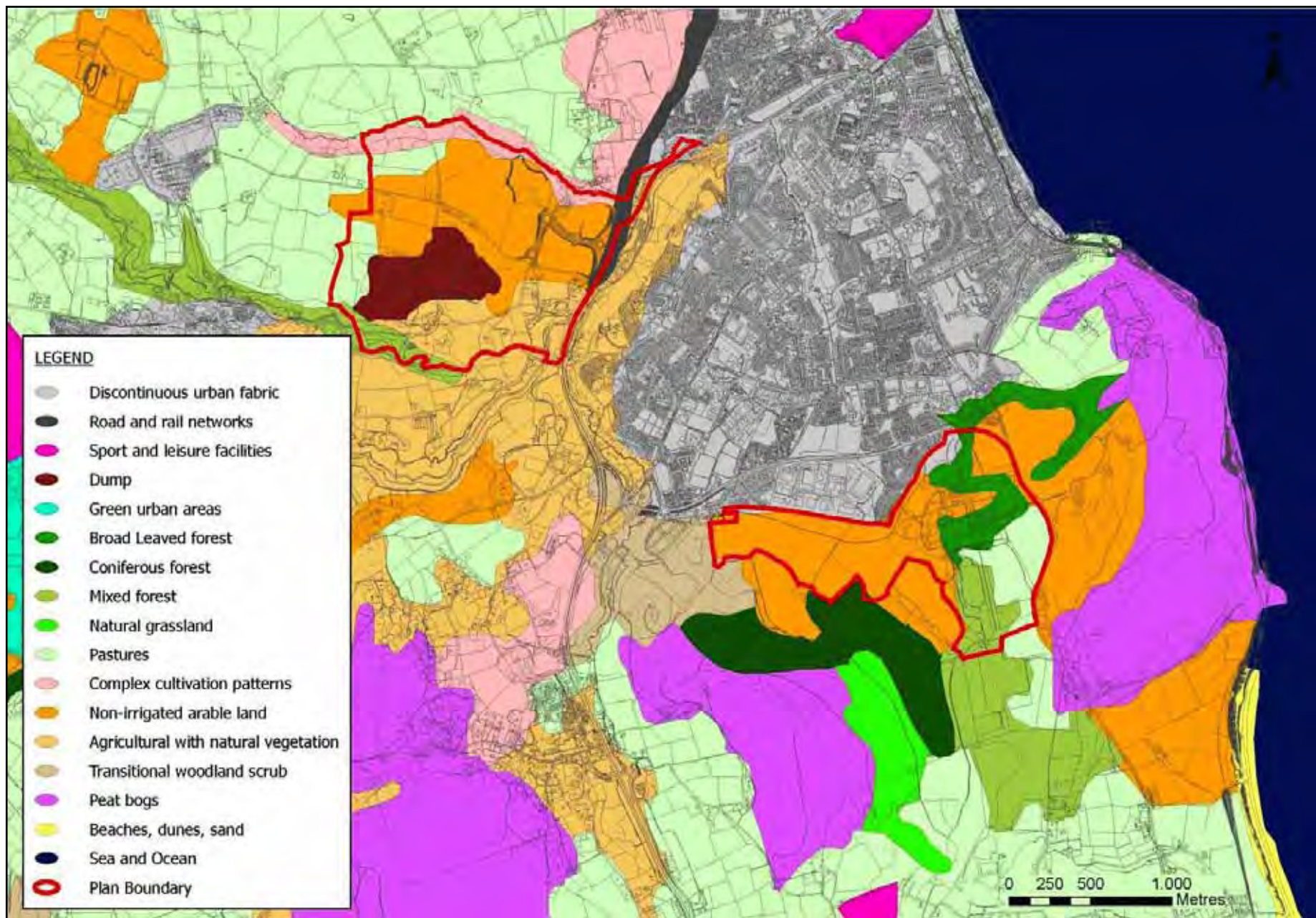


Figure 3.5 CORINE Land Cover 2000

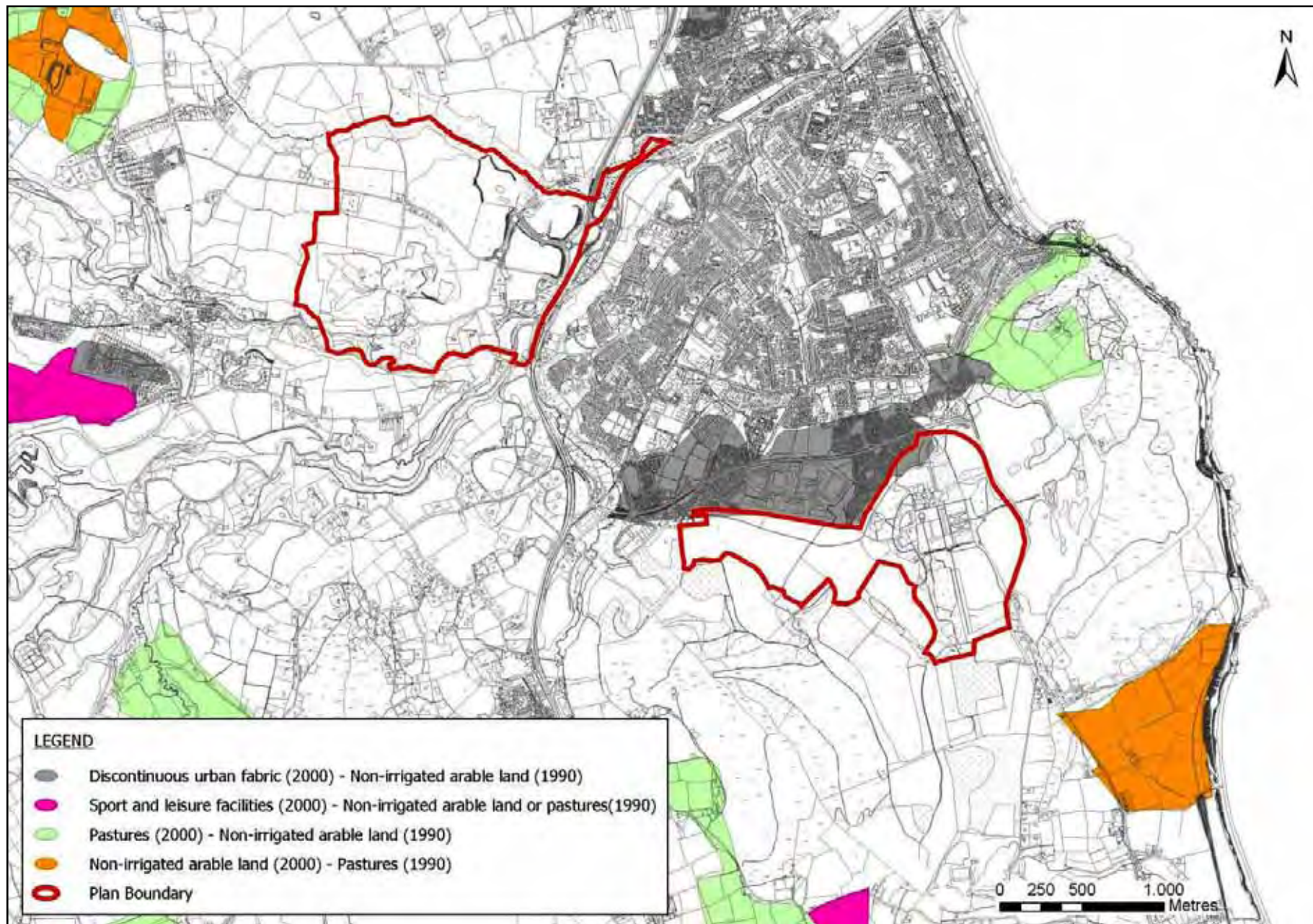


Figure 3.6 CORINE Land Cover Changes 1990-2000

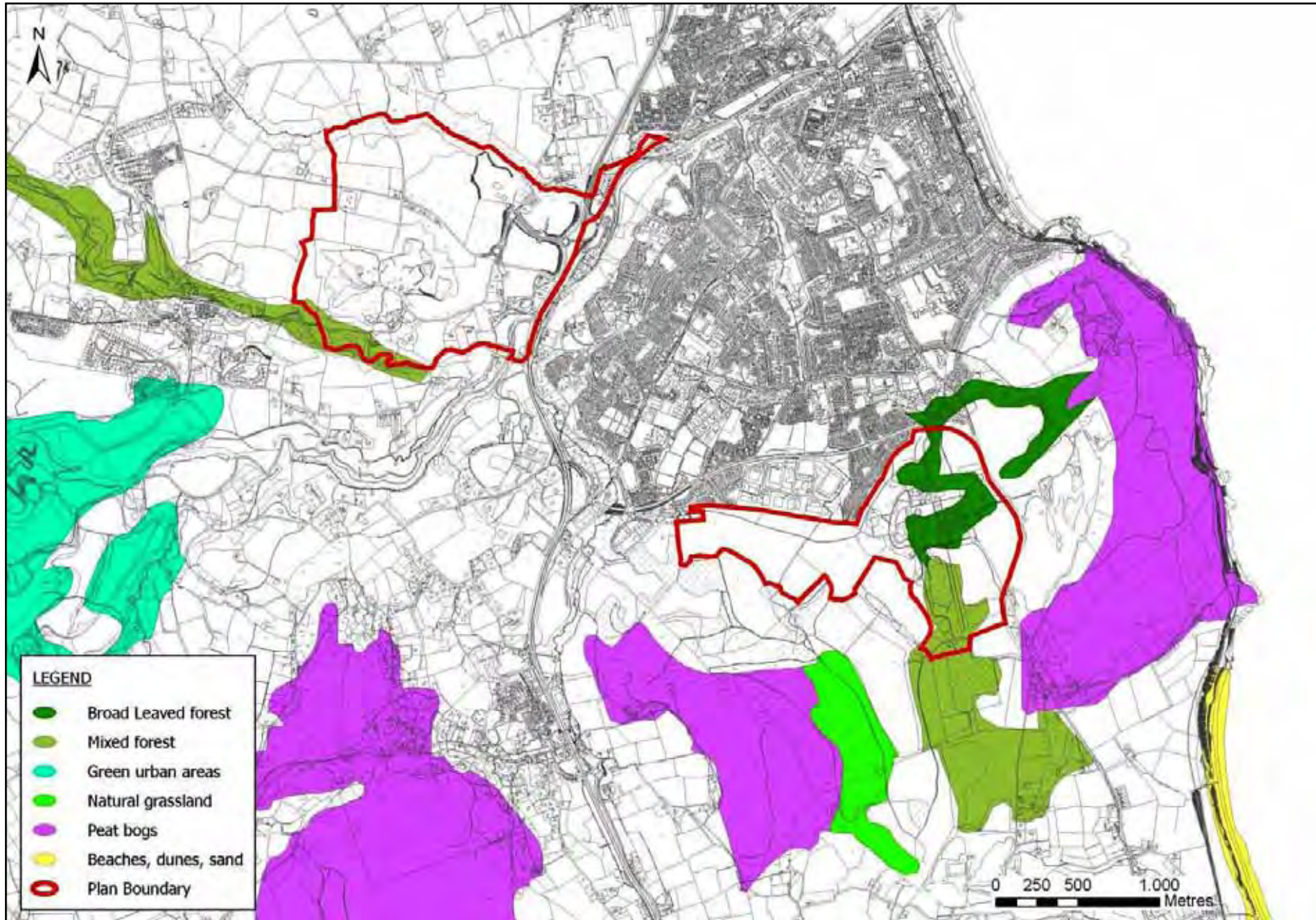


Figure 3.7 CORINE Land Cover Categories indicating most valuable Biodiversity areas

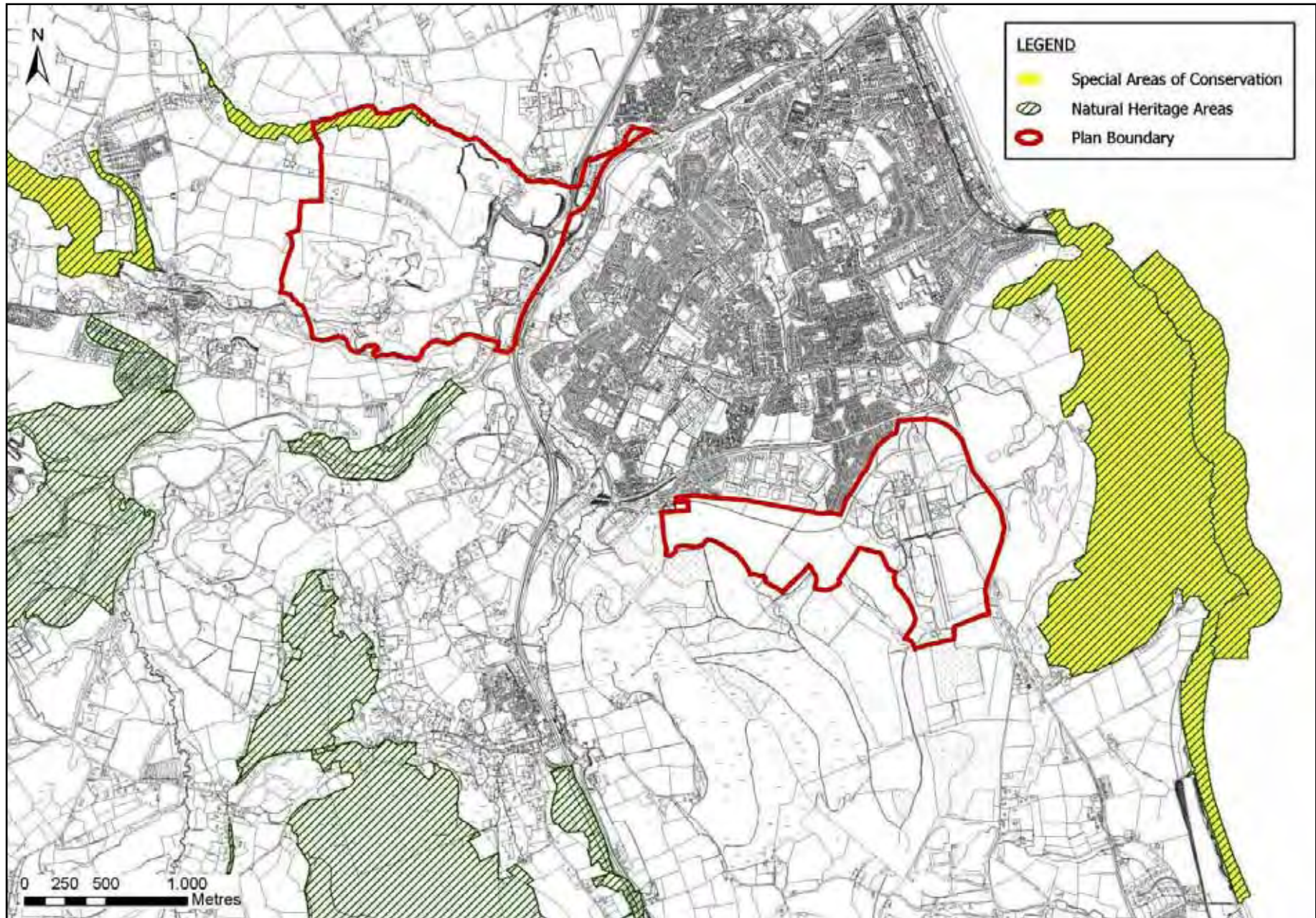


Figure 3.8 Designated Sites within and surrounding the Plan area

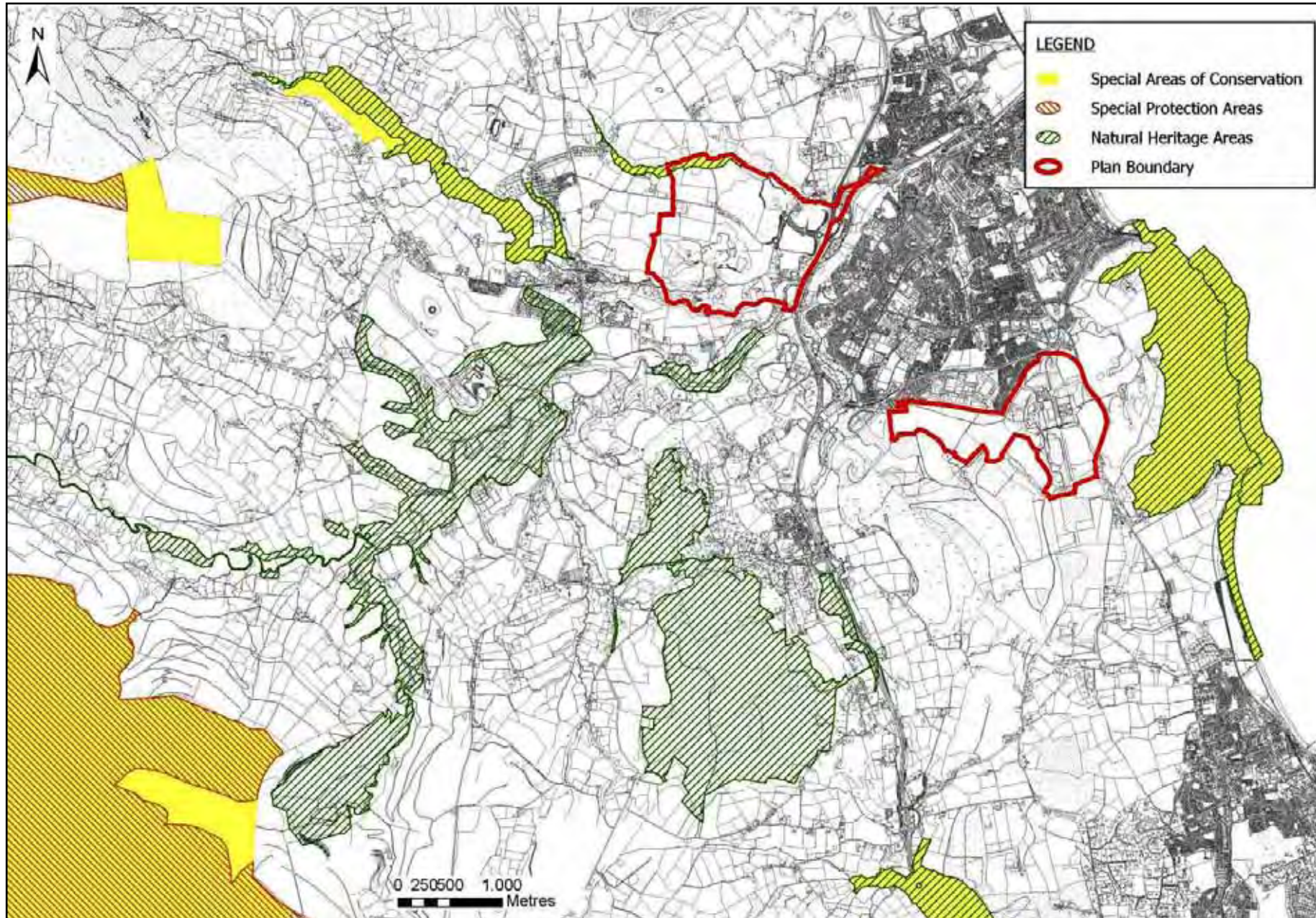


Figure 3.9 Context of Bray Environs Plan Area in relation to the Ecologically Designated Sites within the wider area
CAAS for Wicklow County Council

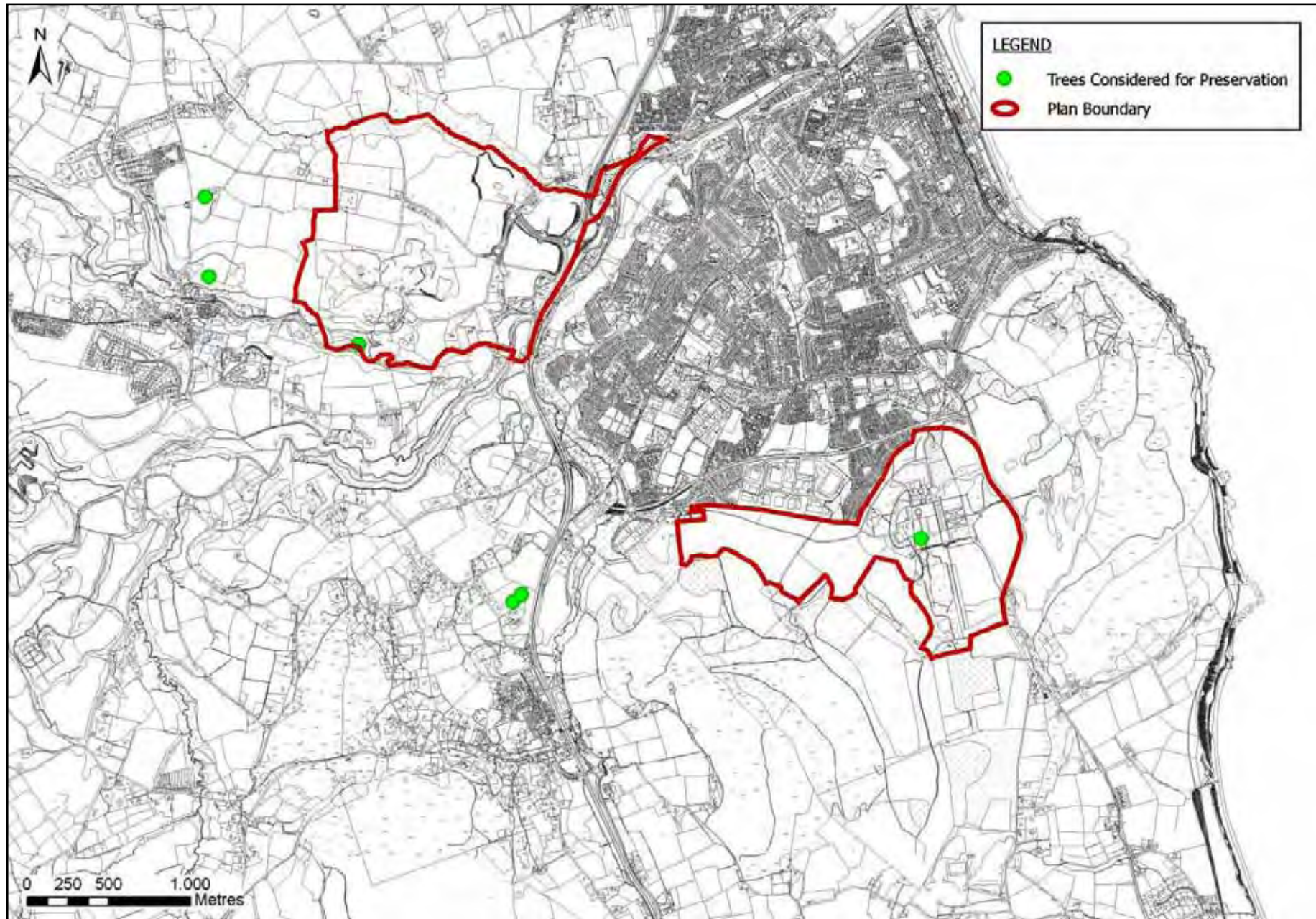


Figure 3.10 Trees Considered for Preservation

3.3 Population and Human Health

3.3.1 Population

Bray is the third largest town in Ireland with a population of almost 32,000 persons. The Plan area falls under the DED of Kilmacanogue. This DED covers an area of 2,564 hectares to the south and west of Bray town. The 2006 Census figures show that the population of the Kilmacanogue DED stood at 3,724⁷. This figure is up from 3,582 in 2002, a 4% increase.

Housing densities in the Plan area are comparatively low. Spatial spread of the population in the Plan area is generally one-off housing, linear in parts.

3.3.2 Human Health

With regard to human health, impacts relevant to the SEA are those which arise as a result of interactions with 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).

Human health has the potential to be impacted upon by environmental vectors including water, soil and air. Hazards or nuisances to human health can arise as a result of exposure to these vectors arising from incompatible adjacent land uses for example. These factors have been considered with regard to the description of: the baseline of each environmental component; and the identification and evaluation of the likely significant environmental effects of implementing the Plan and the alternatives.

The Air Framework Directive deals with each EU member state in terms of "Zones" and "Agglomerations". For Ireland, four zones are defined in the Air Quality Regulations (2002). Bray falls under Zone C whose current air quality status is "Good". This is discussed further in Section 3.6.

⁷ CSO (various) *Census 2002 Volume 1 - Population Classified by Area; Census 2006 Volume 1 - Population Classified by Area* Cork: CSO

3.3.3 Existing Problems

Certain environmental vectors within the Plan area - such as air, water or soil - have the potential to transport and deposit contaminants or pollutants, which have the potential to cause harm and adversely impact upon the health of the area's population. Issues relevant to this potential in Bray Environs include landfills and noise. If the landfills are to continue to behave as they have been doing until now, it is uncertain what effect, if any, they would have on human health. The landfills are monitored on a regular basis. This would help to identify any problems which could impact upon human health. Noise emanating from the N11 could be seen as a potential problem. These issues are expanded upon in Sections 3.4.4 and 3.6.3.

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

Due to the constraints regarding land availability within the administrative boundaries of Bray Town Council, land within the Bray Environs area is required to accommodate the anticipated population increases from higher level land use strategic actions (see Section 5.2). The occurrence of growth in areas not identified as having environments which are compatible to such land uses can result in significant adverse impacts on the environment. As there is likely to be further increases in the population of Bray Environs over the coming years, there is a need to direct growth towards the most robust and away from the most sensitive environments. This can be done by policies and objectives which are included in an LAP and by zoning sufficient amounts of land in order to ensure that growth is directed towards the most compatible environments. In the absence of a LAP such direction of growth would be unlikely to occur and would be likely to result in significant adverse impacts upon a range of environmental components including the landscape, biodiversity, flora and fauna, cultural heritage and water resources. Urban sprawl and joining of settlements would be likely to occur in the absence of a Local Area Plan.

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

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

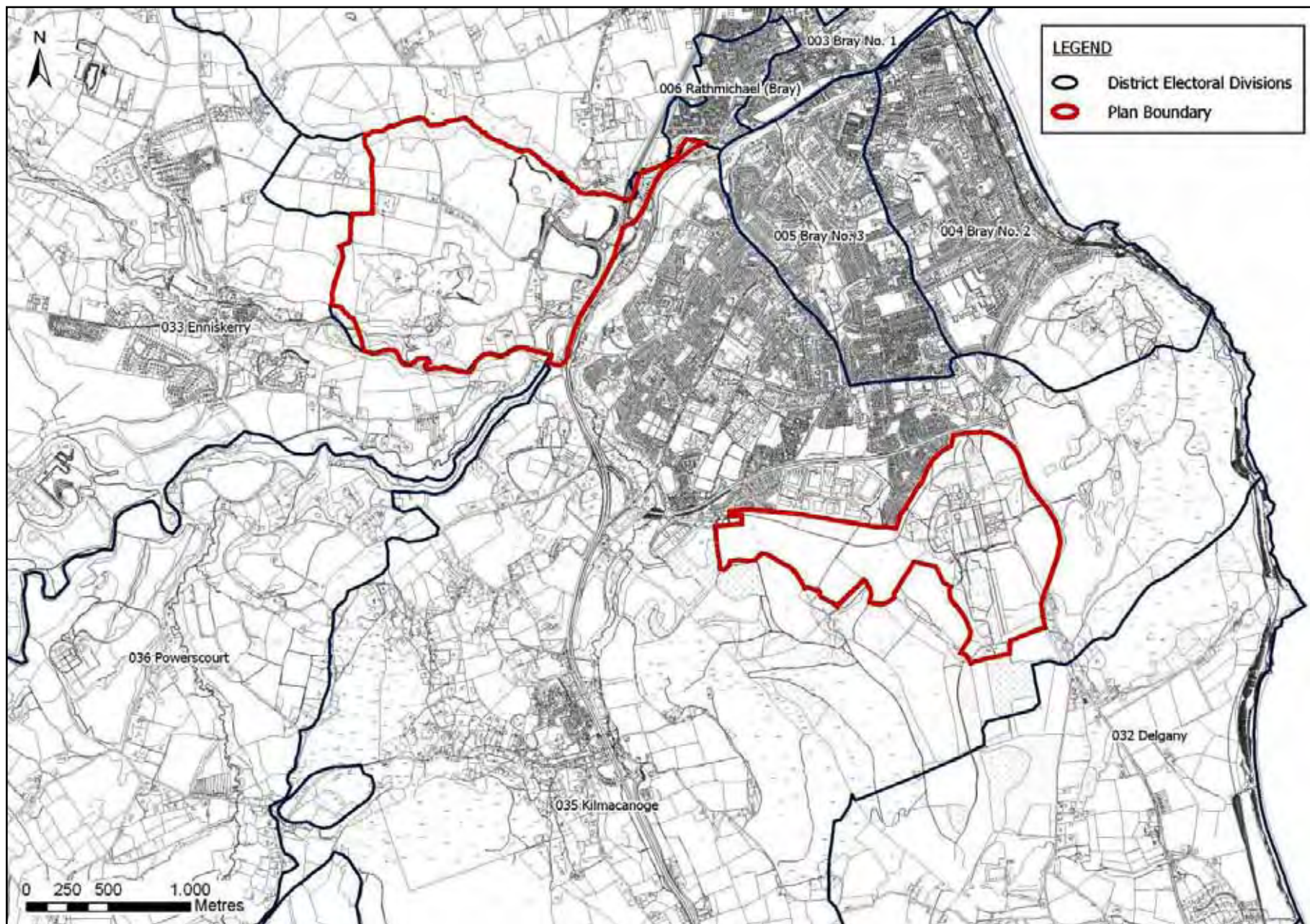


Figure 3.11 District Electoral Divisions

3.4 Soil

3.4.1 Introduction

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

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

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

3.4.2 Soil Types

Figure 3.13 shows the distribution of soils across the Plan area. The biodiversity, flora and fauna detailed under Section 3.2 are facilitated by these soils as is an extent of agricultural land use. The majority of the area is covered by Grey Brown Podzols. Areas of Brown Soils and Lithosols and Rocky Outcrops lie to the south of the Plan area.

3.4.3 Geology and Sites of Geological Interest

The soils and habitats of Bray Environs have been influenced by the county's underlying geology (see Figure 3.12).

The Wicklow County Development Plan designates the following as Areas of Geological and Geomorphological Interest:

- Fassaroe Delta
- Bray Head
- Little Sugar Loaf
- Dargle River Valley

These designations and the extent of their areas are currently under review through the Geological Heritage Program of the Geological Survey Ireland. Areas of geological interest may be designated in the future as Geological Natural Heritage Areas.

The geology of the Bray Environs area consists of the Bray Head Formation, the Devils Glen Formation and the Glencullen River Formation. The Bray Head Formation consists mainly of green, purple, red and grey slates and interbedded greywacke sandstones and sandstones. Thickly bedded white to pink quartzites form prominent coastal and inland features such as the two Sugar Loaf Mountains. The Devils Glen Formation consists of greywackes and slates which are thickly bedded. Its quartzites are very rare. The Maulin Formation comprises grey slates and thin quartzite. The Glencullen River Formation is of early Ordovician age.

3.4.4 Existing Problems relating to Soil

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

There is potential that soil may be polluted and contaminated as a result of pollution from development which is not serviced by appropriate waste water infrastructure and from agricultural sources.

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

In addition to water quality and fishery impacts, these can impact on infrastructure and can have health and safety implication.

Figure 3.15 provided to CAAS by Wicklow County Council indicates a number of areas

where known landfilling activity was carried out in the past. These areas lie in close proximity to one another at the northern boundary of the Fassaroe study area.

Activity at these landfills began in the 1970's. They are unlined and capped and were used to dispose of municipal waste. The sites are kept under observation, and gas testing is carried out on a regular basis they are walked to check for settlement or breaks in the capping.

There is uncertainty as to where the landfill sites lie relative to zoning boundaries. The area lies east of a proposed residential zone where there are some existing dwellings.

Decomposition of materials in the landfill sites may pollute and contaminate soils.

The removal and disposal of landfilled material from the areas mentioned above could, if unmitigated, cause problems for water quality, ecology and human health.

A list of issues associated with unauthorised waste disposal sites is contained in the EPA's Code of Practice, Environmental Risk Assessment for Unregulated Waste Disposal Sites⁸.

3.4.5 Evolution of Soil in the absence of the Local Area Plan

In the absence of a Local Area Plan for Bray Environs, the evolution of soil would be dependent on developments which take place.

⁸ Code of Practice, Environmental Risk Assessment for Unregulated Waste Disposal Sites, EPA, 2007.
http://www.epa.ie/downloads/advice/waste/waste/epa_cop_waste_disposal_sites.pdf

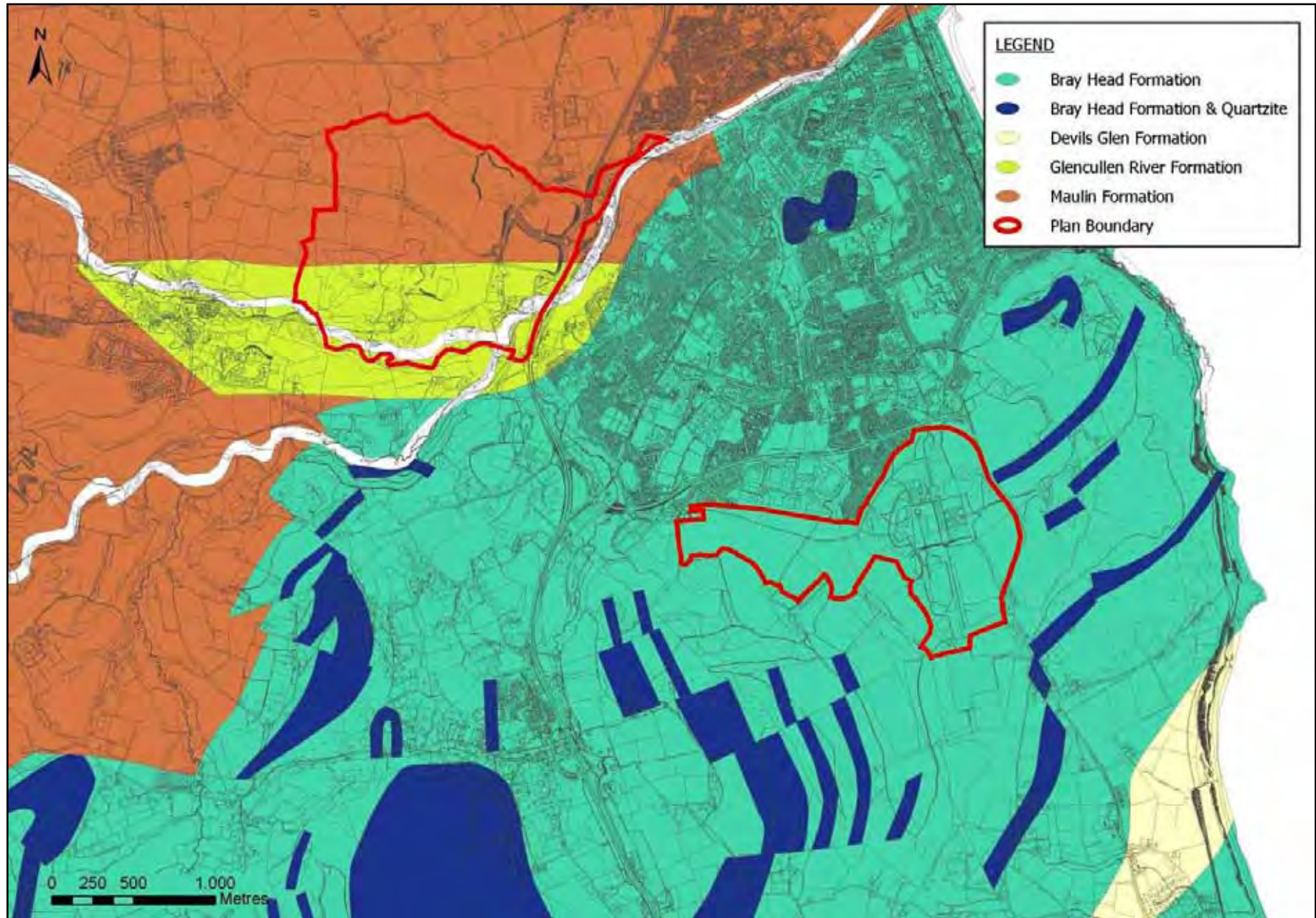


Figure 3.12 Geology

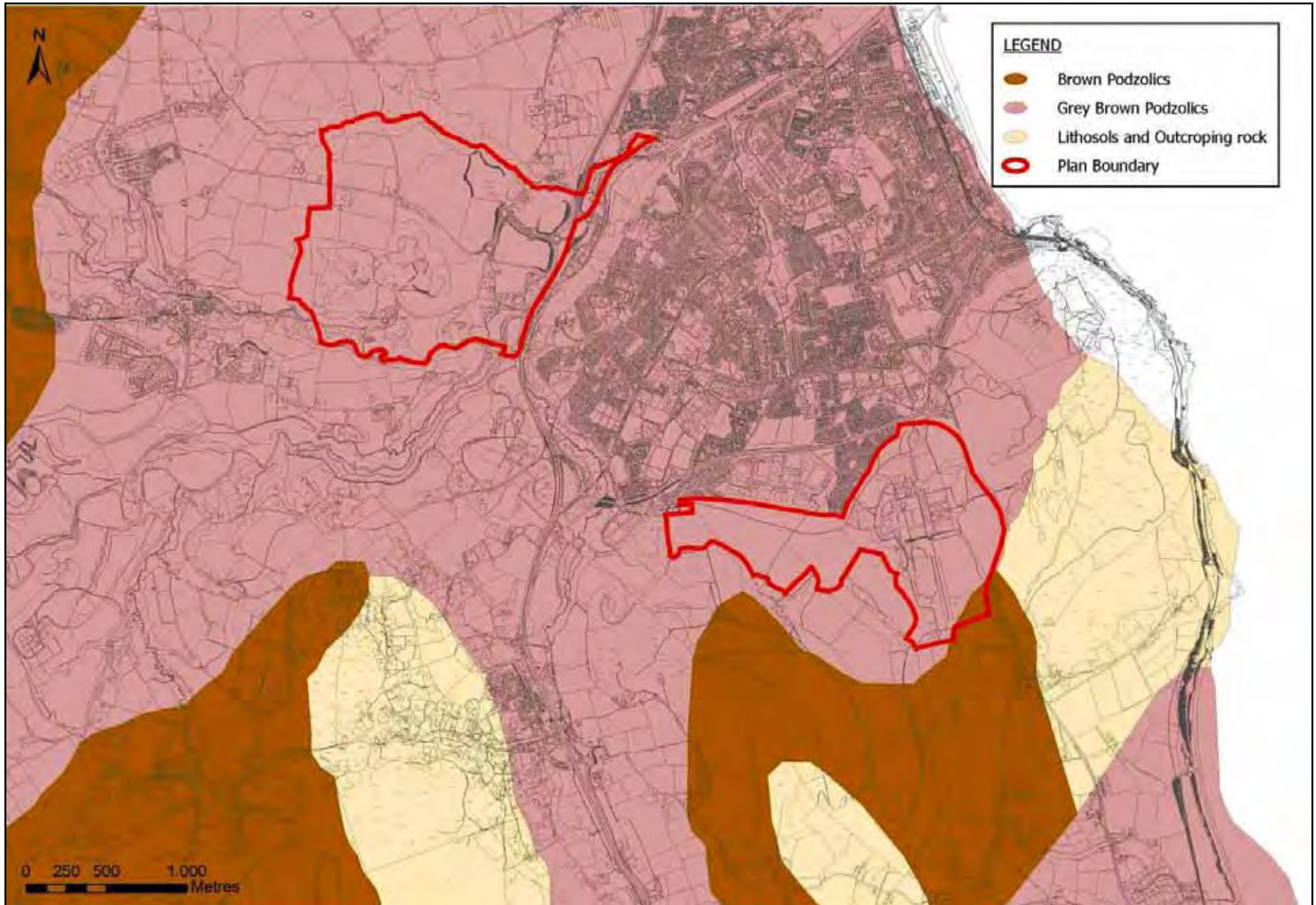


Figure 3.13 Soil Type

CAAS for Wicklow County Council

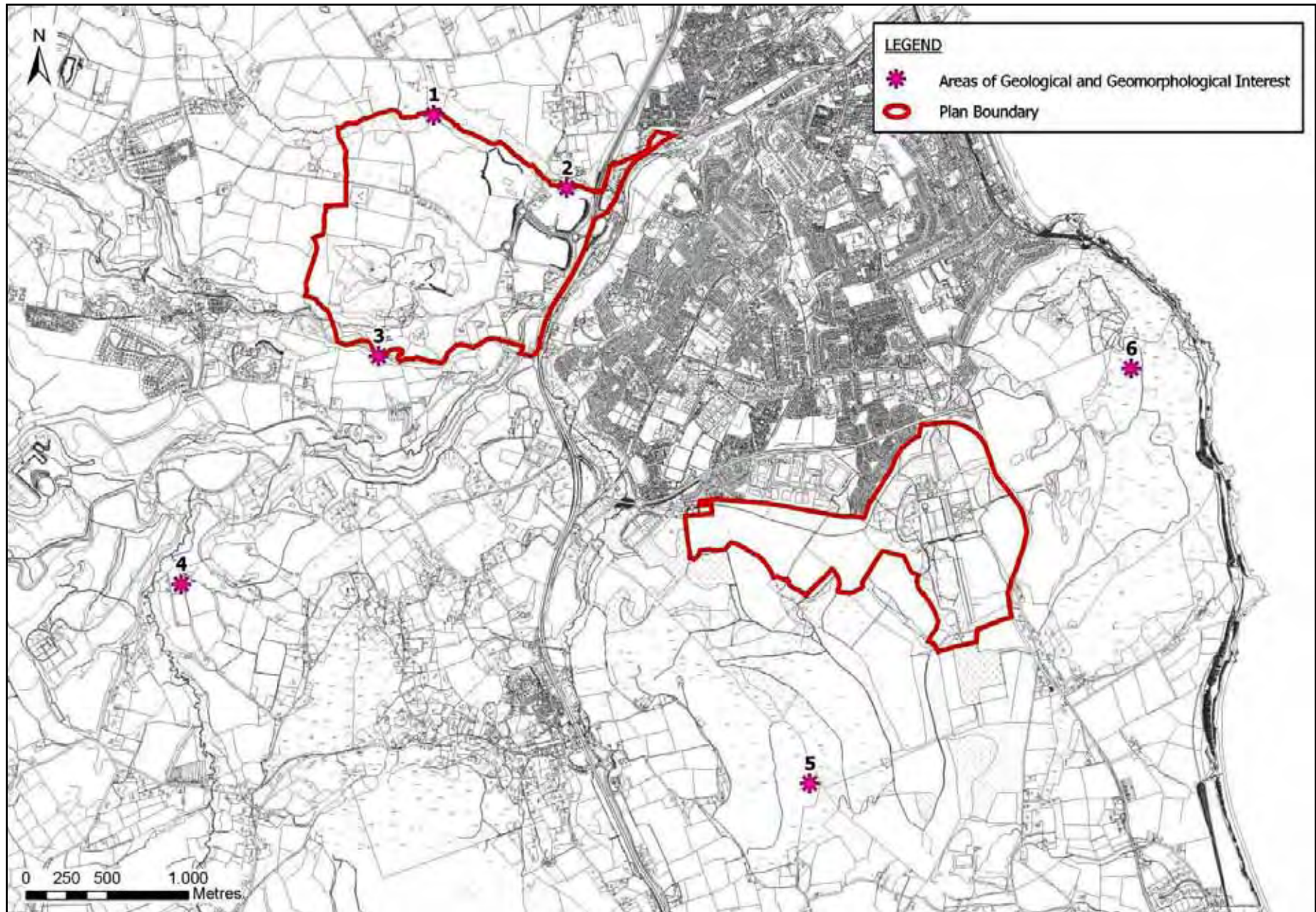


Figure 3.14 Areas of Geological and Geomorphological Interest

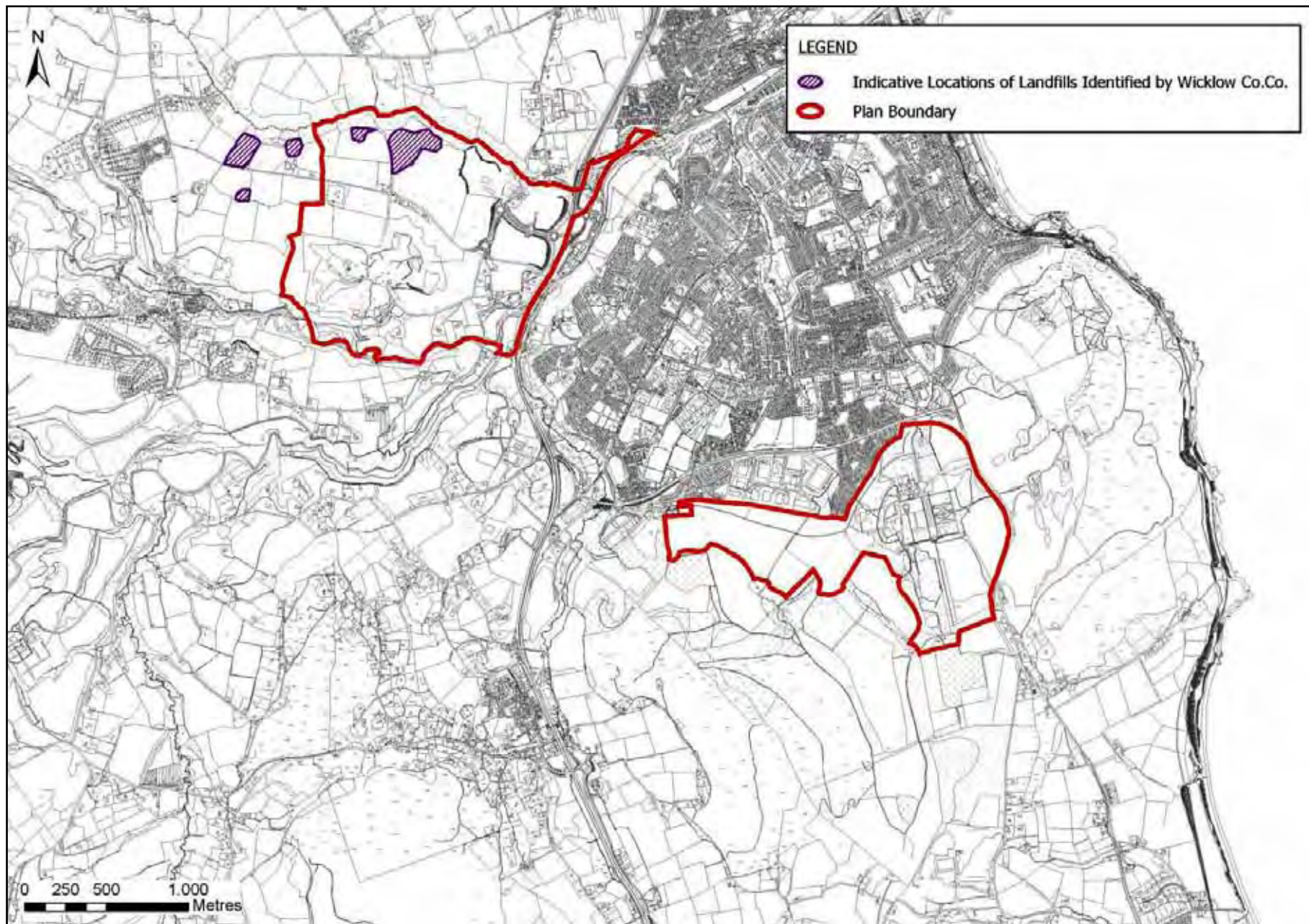


Figure 3.15 Indicative locations of landfills as identified by Wicklow County Council

3.5 Water

3.5.1 Introduction

Water within and surrounding Bray Environs has many functions: it provides drinking water to the area's population; it sustains the biodiversity and flora and fauna described under Section 3.2; and it is an integral part of the landscape.

3.5.2 Potential Pressures on Water Quality

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

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

A *point source* pressure has a recognisable and specific location at which pollution may originate. Examples of significant point source pressures include direct discharges from waste water treatment plants, licensed discharges from industrial activities, landfills, contaminated lands (e.g. disused gas works) and mines.

A *diffuse source* pressure unlike a point source is not restricted to an individual point or location. The source of a diffuse pressure can be quite extensive. Significant examples of diffuse pressures include runoff from forestry and agricultural lands.

Excessive *abstractions* from surface waters and groundwater for drinking and industrial purposes can create pressures on the ability of a water body to maintain both chemical and ecological status.

Structural alterations such as river straightening; construction of embankments, weirs, dams, port facilities and dredging can create conditions such that a water body is no longer able to support the natural ecology which would have existed prior to

such modifications. These pressures are also referred to as morphological pressures.

3.5.3 The Water Framework Directive

3.5.3.1 Introduction and Requirements

Since 2000, Water Management in the EU has been directed by the Water Framework Directive 2000/60/EC (WFD). The WFD requires that all member states implement the necessary measures to prevent deterioration of the status of all waters - surface, ground, estuarine and coastal - and protect, enhance and restore all waters with the aim of achieving good status by 2015. All public bodies, including Bray Town Council and Wicklow County Council, are also required to: coordinate their policies and operations so as to maintain the good status of water bodies which are currently unpolluted; and improve polluted water bodies to good status by 2015.

3.5.3.2 River Basin Districts and Water Bodies

For the purpose of implementing the WFD, Ireland has been divided into eight river basin districts or areas of land that are drained by a large river or number of rivers and the adjacent estuarine / coastal areas. The management of water resources will be on these river basin districts. The Plan area is located in the Eastern River Basin District (ERBD).

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

3.5.3.3 WFD Risk Assessments

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

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

Risk assessment procedures were developed at national level and applied across all River Basin Districts in order to analyse the impact of the pressures referred to under Section 3.5.2. The risk assessments were predictive, i.e. they examined each pressure and predicted the magnitude which would be likely to have a negative impact.

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

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

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

3.5.3.4 WFD Registers of Protected Areas

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

The WFD requires that these RPAs contain: areas from which waters are taken for public or private water supply schemes; designated shellfish production areas; bathing waters; areas which are affected by high levels of substances most commonly found in fertilizers, animal and human wastes - these areas are considered nutrient sensitive; areas designated for the protection of habitats or species e.g. salmonid areas; Special

Areas of Conservation (SACs); and, Special Protection Areas (SPAs).

In Ireland, waters intended for human consumption are protected under the Drinking Water Regulations (S.I. 439/2000). The Cookstown River has been listed on the RPA for Drinking Water. Groundwater underlying the Plan area is listed on the RPA for Drinking Water (Ground Water).

The Dargle River has been listed on the RPA for Habitat Rivers. Wildlife habitats (as identified by the National Parks and Wildlife Service) that are dependent on water are included in the Register.

The water bodies listed on the RPA are mapped on Figure 3.23.

3.5.3.5 River Basin Management Plan

Local Authorities located in the ERBD, including Wicklow County Council, have prepared a draft River Basin Management Plan which will be implemented in order to help protect and improve waters in the RBD. This draft Plan was published in December 2009 and a period of public consultation is taking place until 22 June 2009. Public comment will be taken into consideration in preparing the final River Basin Management Plan, which is due for publication by 22 December 2009. The Management Plan will provide specific policies for individual river basins in order to implement the requirements of the WFD.

3.5.4 Rivers

3.5.4.1 Introduction

The two largest surface water bodies which flow through the Plan area are the River Dargle, which flows through the south-eastern corner of the Fassaroe site, and the Cookstown River, which forms the southern boundary of the Fassaroe site. The confluence of these rivers is just inside the south eastern boundary of the Fassaroe site. There is a small stream which forms the northern boundary of the Fassaroe site.

Of these rivers the River Dargle is the largest. The Dargle rises in the Wicklow Mountains and flows in a north-easterly direction for twelve miles before entering the sea at Bray. The Cookstown River rises as the Glencullen River in Prince Williams Seat to the east of Bray

Town and flows through Enniskerry, where it becomes known as the Cookstown River. It merges with the Dargle at the south eastern corner of the Fassaroe site.

3.5.4.2 Salmonid Rivers

The main channel of the River Dargle is designated and protected as Salmonid Waters under the European Communities (Quality of Salmonid Waters) Regulations 1988 (SI No. 293 of 1988). Designated Salmonid Waters are capable of supporting salmon (*Salmo salar*), trout (*Salmo trutta*), char (*Salvelinus*) and whitefish (*Coregonus*). The Cookstown River is a tributary of the Dargle which could indicate that salmonid species may be present.

3.5.4.3 Risk Assessment

Figure 3.17 shows the current risk assessment for the River Dargle and the Cookstown River. In terms of achieving the WFD's objectives by 2015, both rivers are currently classified as being *(1a) at significant risk of failing to achieve the WFD's objectives by 2015*. Diffuse source pressures can be attributed to this classification.

3.5.5 Transitional, Bathing and Coastal Waters

3.5.5.1 Introduction

As defined by the WFD, transitional waters are bodies of surface water in the vicinity of river mouths which are partly saline in character as a result of their proximity to coastal waters but which are substantially influenced by freshwater flows.

Coastal water is surface water on the landward side of a line, every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of territorial waters is measured, extending where appropriate up to the outer limit of transitional waters.

Coastal waters are important for tourism, for use as bathing locations and for supporting marine wildlife.

3.5.5.2 Water Quality

In Ireland, monitoring of water quality at designated bathing areas is undertaken by Local Authorities in accordance with Bathing Water Regulations (S.I. 155 of 1992). The EPA reports the compliance results of these 131 sites annually.

There are three compliance categories: non compliant sites fail to meet the necessary quality criteria, sites compliant with mandatory values meet the minimum quality criteria and sites compliant with guide values meet all the recommended quality criteria. Quality of bathing water in Bray is classified as being compliant with EU Mandatory Values (Acceptable Quality). This is mapped on Figure 3.18. This is a decrease in quality for previous years where bathing water in Bray complied with Guide Values (good quality) for the years 2005 and 2006.

3.5.5.3 WFD Risk Assessment of Waters

The WFD risk assessment of transitional waters for the Bray area shows that waters at Bray Harbour are classified as being *(1a) at significant risk of not achieving good status*.

Figure 3.19 shows the WFD risk assessment for the coastal waters located off Bray. The coastal waters of the South-Western Irish Sea - Killiney Bay are classified as being *(1a) at significant risk of not achieving good status*.

Point source pollution such as water treatment plants and other pressures could possibly be the reason behind the classification of the South-western Irish Sea - Killiney Bay. Morphological pressures such as coastal defences and intensive land uses are the reasons for the classification of Bray Harbour.

3.5.6 Groundwater

3.5.6.1 Introduction

Groundwater is stored in the void spaces in underground layers of rock, or aquifers. These aquifers are permeable, allowing both the infiltration of water from the soils above them and the yielding of water to surface and coastal waters. Groundwater is the part of the subsurface water that is in the saturated zone - the zone below the water table, the uppermost level of saturation in an aquifer at which the pressure is atmospheric, in which all pores and fissures are full of water.

3.5.6.2 WFD Risk Assessment of Groundwaters

Figure 3.20 maps the current risk assessment for groundwater in the Bray Environs area. Groundwater at the Kilruddery site and in the western part of the Fassaroe site is classified as being *(1b) probably at significant risk of not*

achieving good status. Reasons for this include landfills and mobile chemicals. The groundwater bodies underlying the remainder of Bray Environs are currently classified as being (2a) *expected to achieve good status* by 2015.

Urban groundwater pollution sources and pathways are complex, and sources of pollution are difficult to control. Because of the complexities involved, urban groundwater pollution is considered to be a significant water management issue on a national scale as: Irish towns are growing rapidly; and, the financial costs of returning affected groundwater bodies to WFD status objectives will likely be significant, requiring extensive monitoring and management measures.

3.5.6.3 Groundwater Vulnerability

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

Figure 3.21 maps this rating for the Plan area. It indicates that the Fassaroe area is generally rated as *High* with the south and east of that area rated as *Extreme*. There is a small area along the eastern Fassaroe site rated as *Extreme (rock near surface or Karst)*. The vulnerability varies from *Moderate to High to Extreme* moving from east to west through the Kilruddery site.

3.5.6.4 Groundwater Productivity

The GSI rates aquifers based on the hydrogeological characteristics and on the value of the groundwater resource. Ireland's entire land surface is divided into nine aquifer categories. The Plan area is divided into two different classifications as seen on Figure 3.22. The northern two thirds of the Fassaroe site are underlain by a locally important aquifer which is moderately productive only in local zones-it is capable of yielding enough water to boreholes or springs to supply villages, small towns or factories. The majority of the Plan area is underlain by a poor aquifer which is generally unproductive except for in local zones.

3.5.7 Existing Problems

The above descriptions identify a number of sensitivities with regard to the status of water bodies within the Bray Environs Plan area. By virtue of how they are used by people and by

wildlife, the Cookstown River, the River Dargle and the groundwater underlying the Plan area are all listed on the Registers of Protected Areas under the Water Framework Directive.

The River Dargle and the Cookstown River are both at significant risk of failing to achieve the WFD's objectives of good status by 2015.

Ground waters underlying the Plan area are at risk or possibly at risk of failing to meet the objective.

The coastal waters of the South-Western Irish Sea - Killiney Bay are at significant risk of not achieving good status.

Transitional waters at Bray Harbour are also at significant risk of not achieving good status.

Leachate from the illegal landfills mentioned in Section 3.4.4 could pose a threat to water bodies, especially as they are unlined.

3.5.8 Evolution of Water in the absence of a Local Area Plan

Based on the current risk assessments, rivers, coastal waters and the most of the underlying groundwater within and surrounding the Plan area are likely to fail to meet their commitments under the WFD.

If new development was not accompanied by appropriate waste water infrastructure /capacity then it is likely that:

- Rivers and coastal waters would fail to meet WFD commitments;
- Groundwaters would possibly not meet WFD commitments; and,
- Significant adverse impacts upon the biodiversity and flora and fauna of Bray Environs area would be likely to arise.

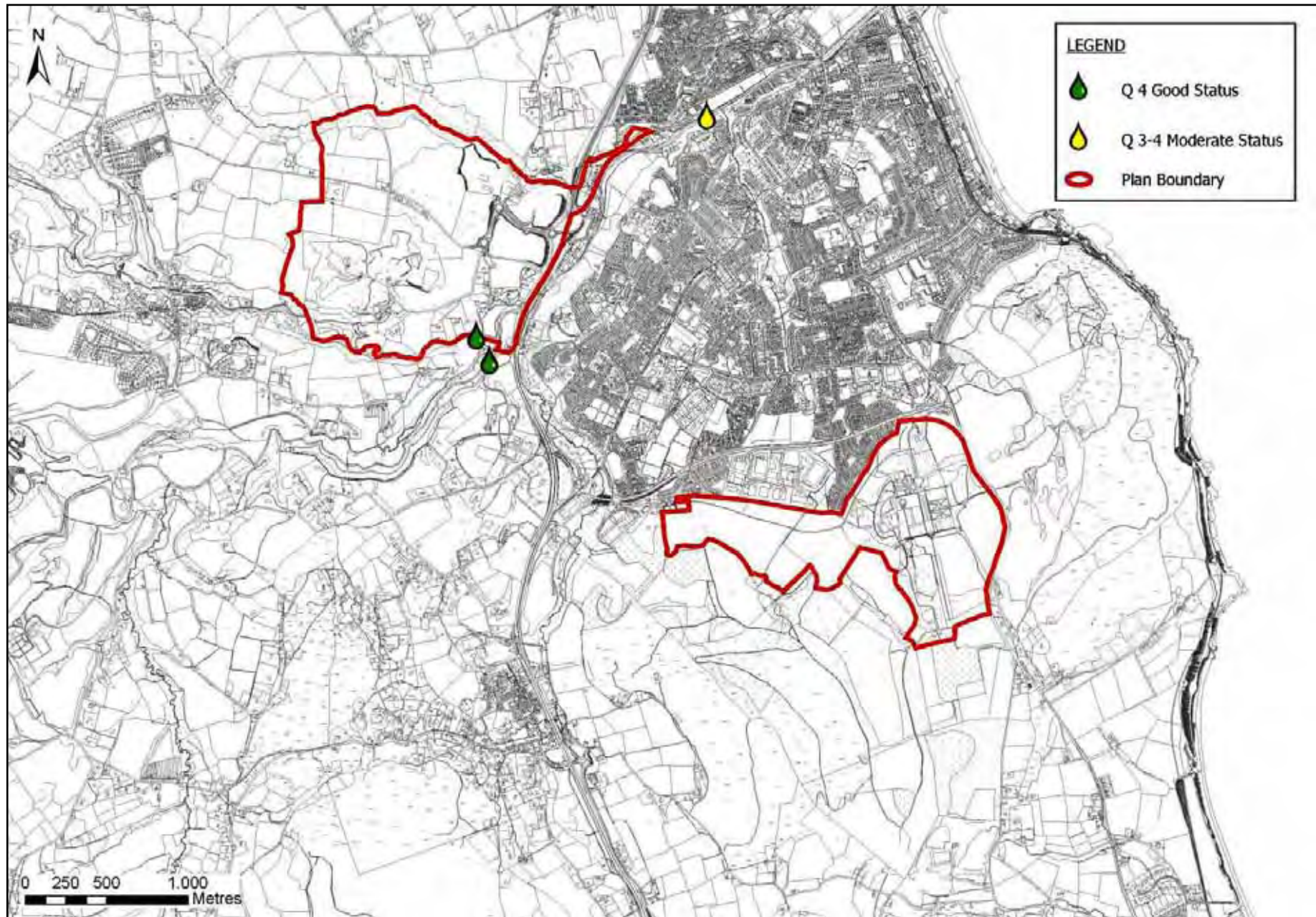


Figure 3.16 Q Values (Biotic Index Rating) for Points on River Water Bodies

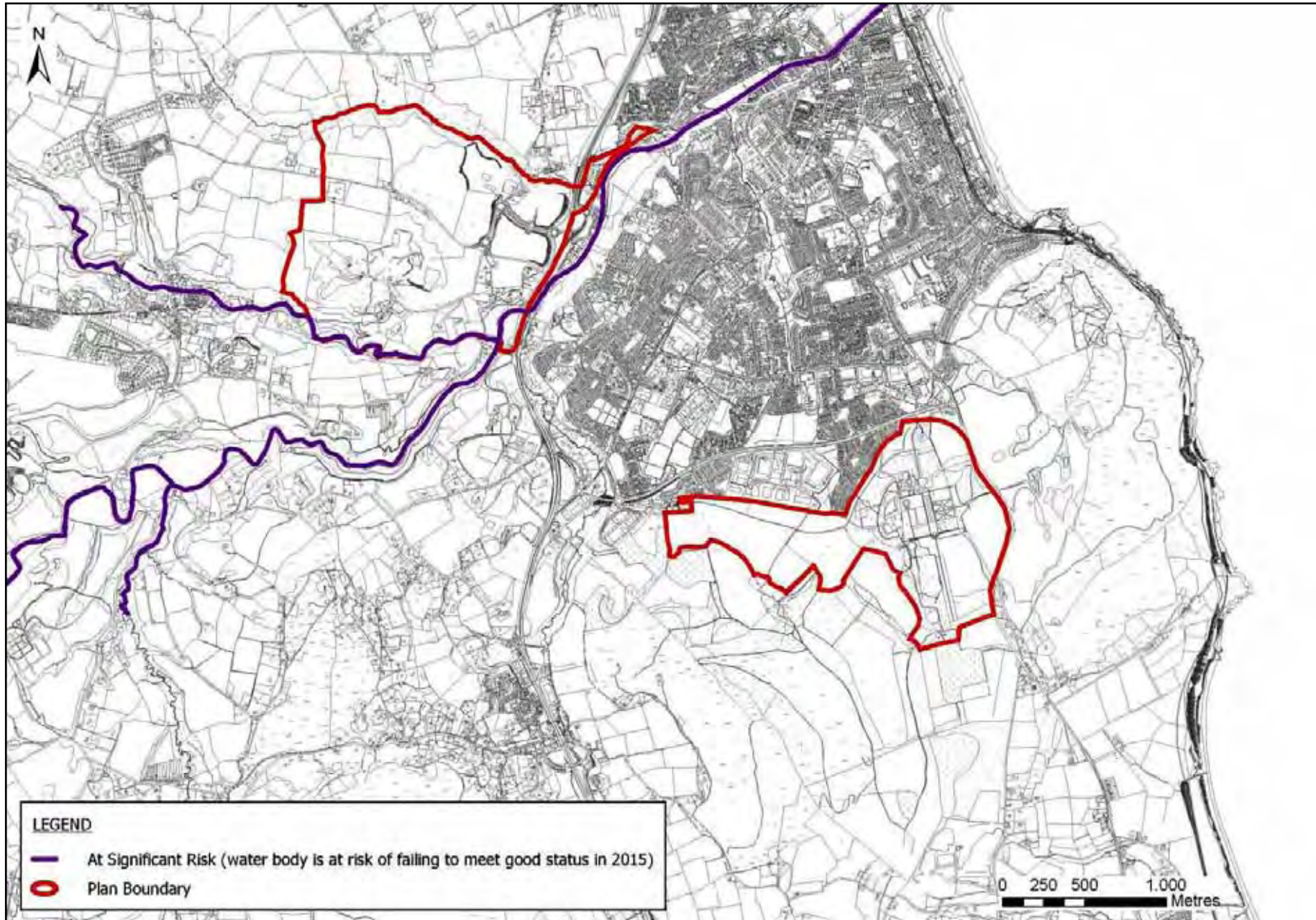


Figure 3.17 Risk Assessment of River Water Bodies

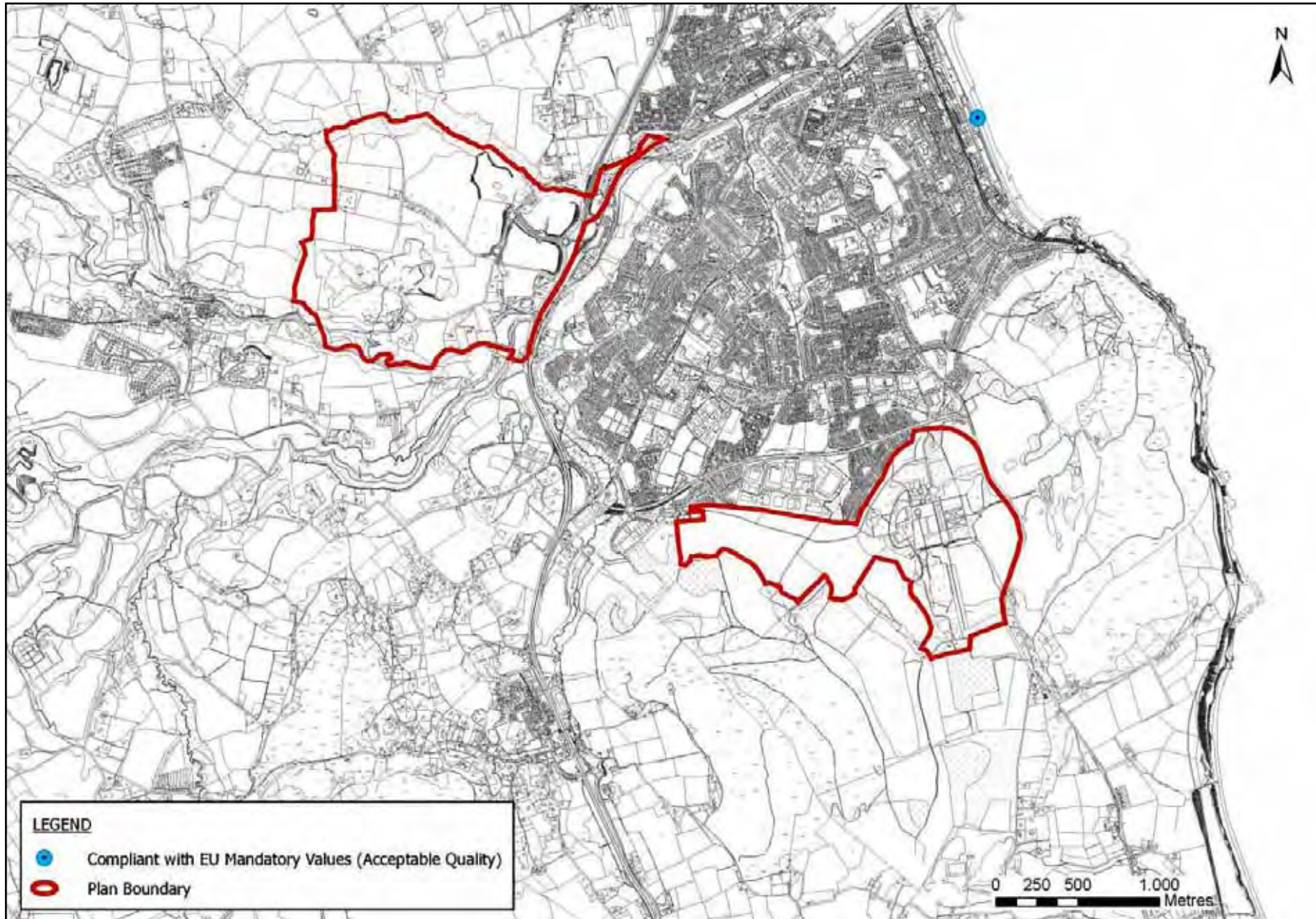


Figure 3.18 Quality of Bathing Waters

CAAS for Wicklow County Council

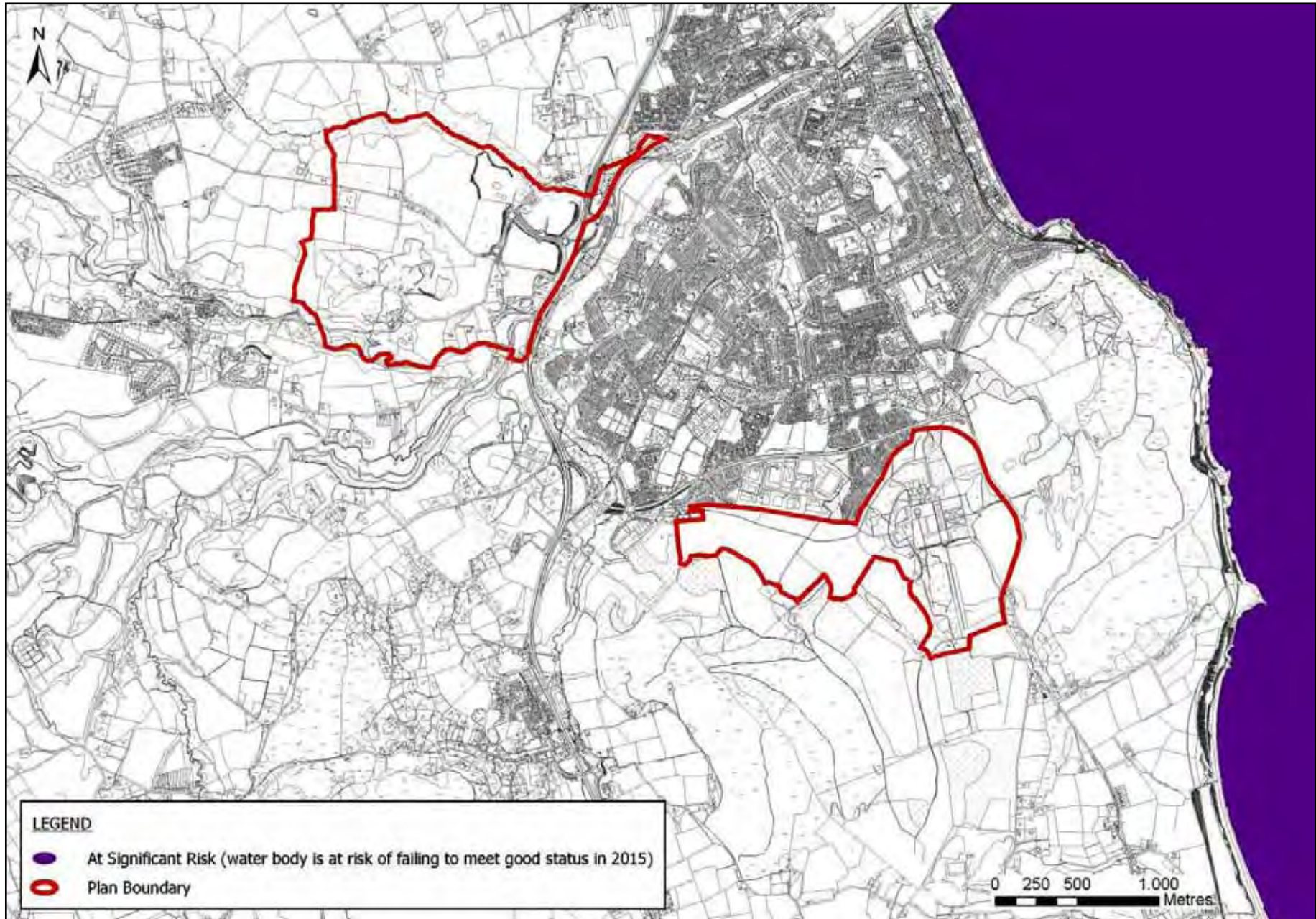


Figure 3.19 Risk Assessment of Coastal Waters

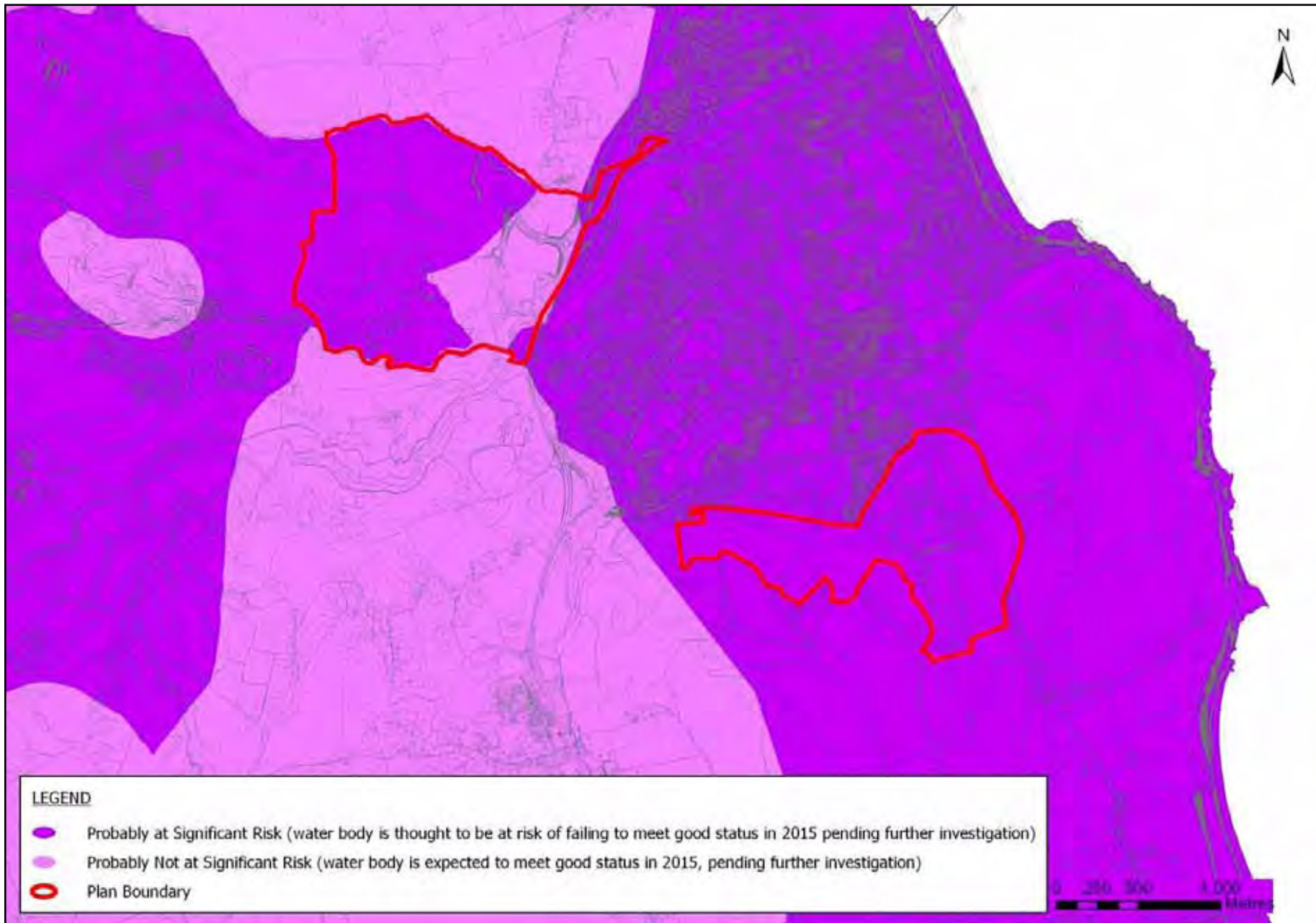


Figure 3.20 Risk Assessment of Groundwaters

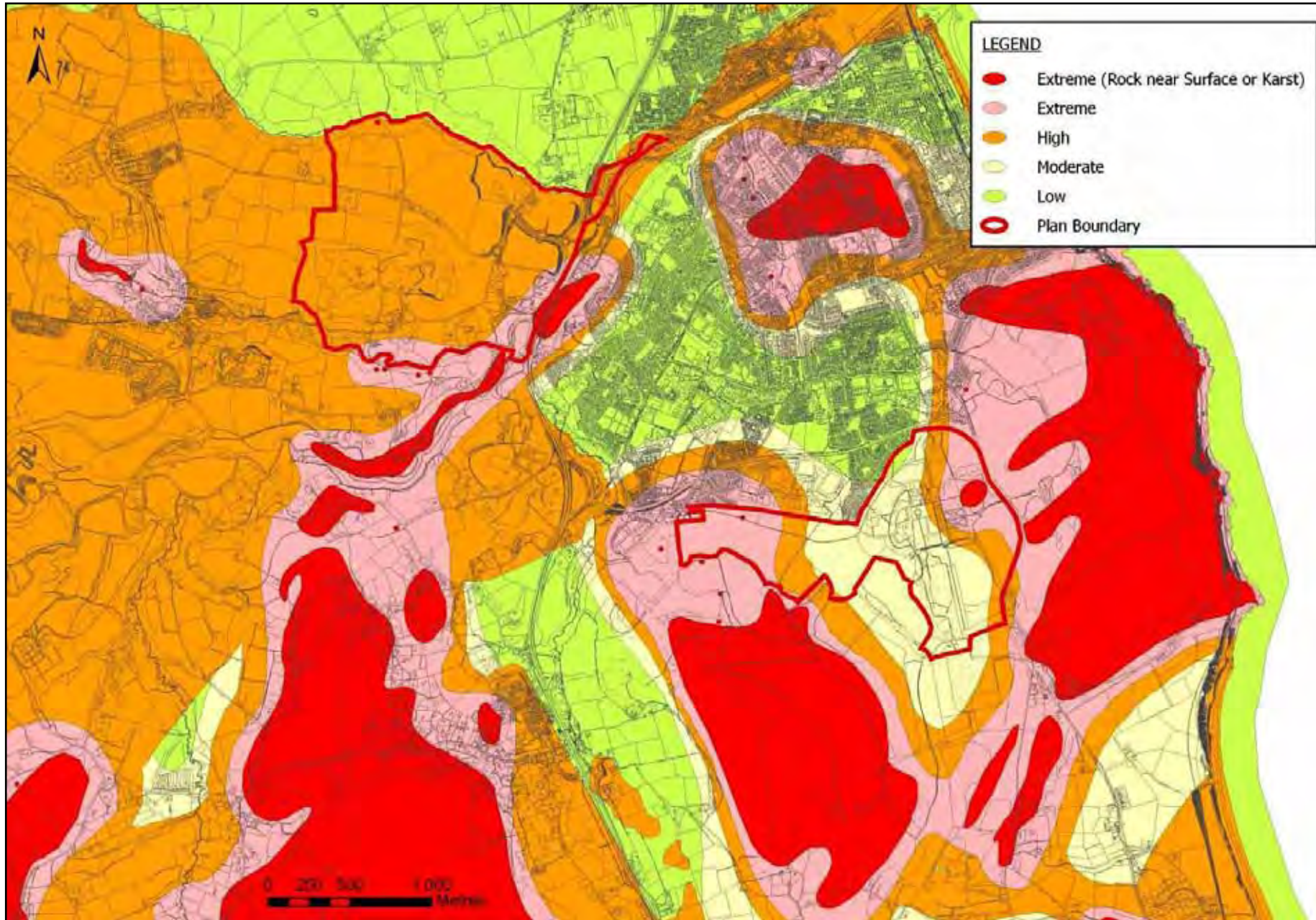


Figure 3.21 GSI Groundwater Vulnerability

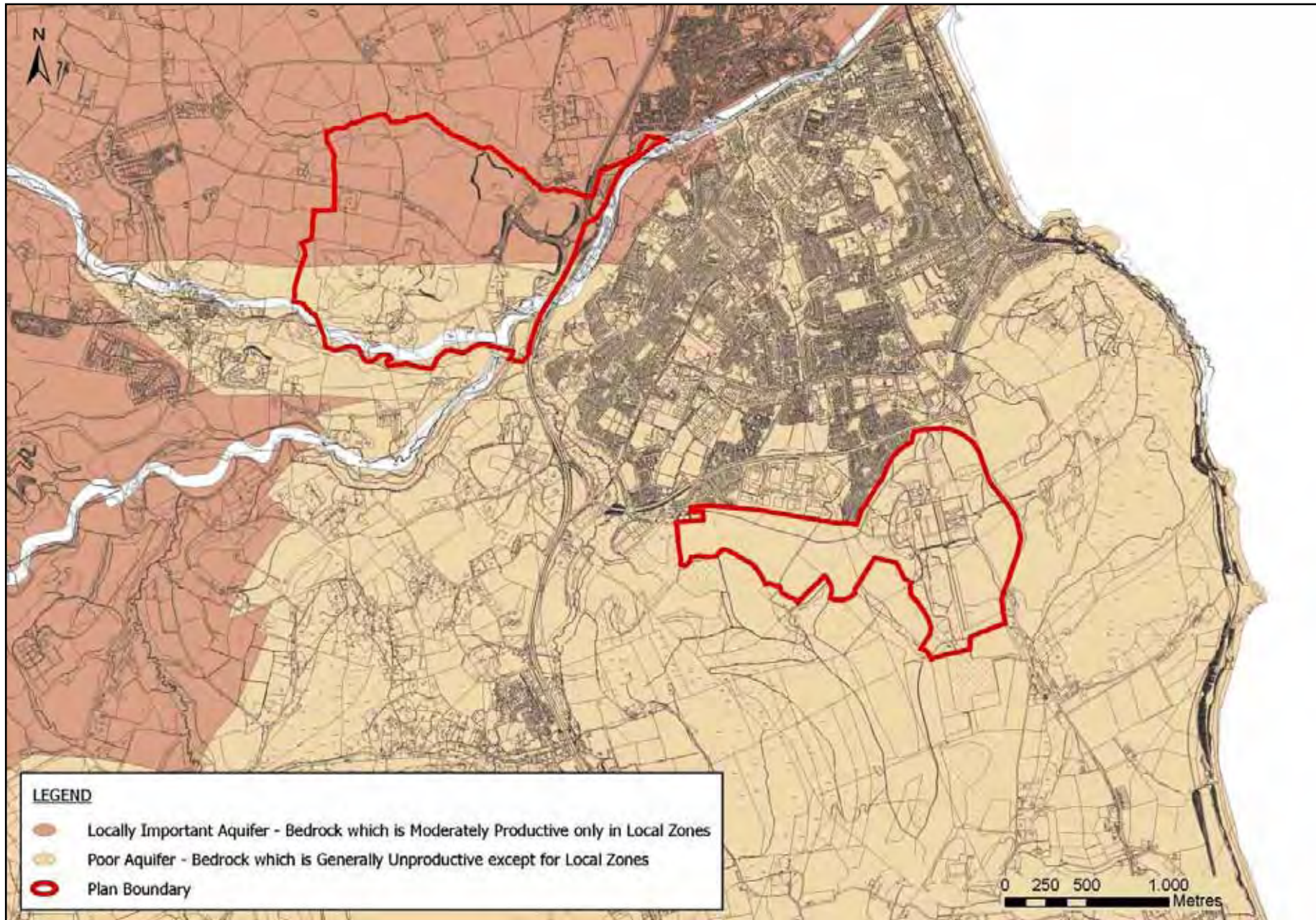


Figure 3.22 GSI Groundwater Productivity

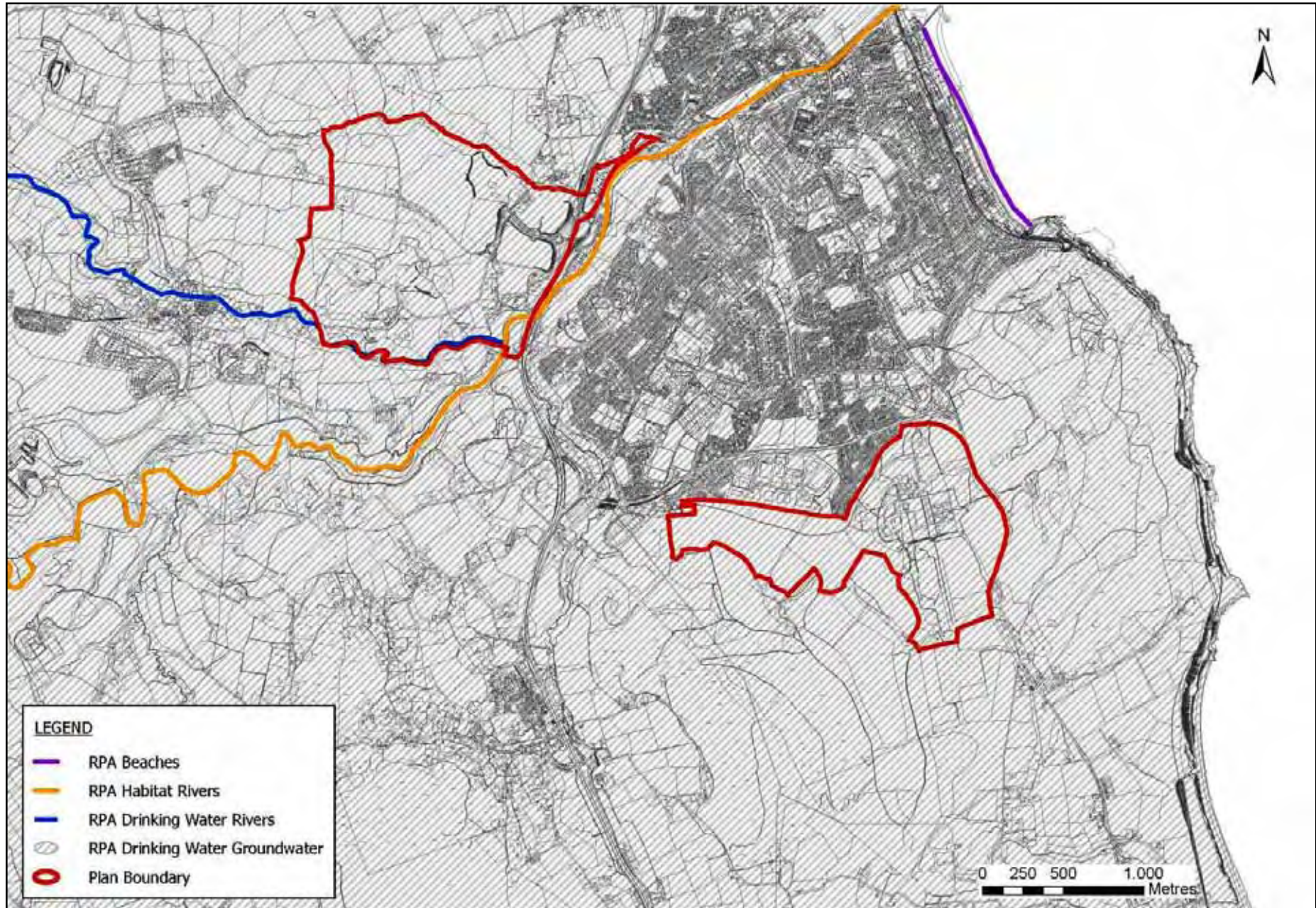


Figure 3.23 WFD Register of Protected Areas

and rural areas of the country - excluding Zones A, B and C.

3.6 Air and Climatic Factors

3.6.1 Ambient Air Quality

3.6.1.1 Introduction and Legislation

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

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

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

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

- Zone A: Dublin Conurbation.
- Zone B: Cork Conurbation.
- Zone C: Other cities and large towns comprising Galway, Limerick, Waterford, Clonmel, Kilkenny, Sligo, Drogheda, Wexford, Athlone, Ennis, Bray, Naas, Carlow, Tralee and Dundalk.
- Zone D: Rural Ireland, i.e. the remainder of the State - small towns

Bray falls into zone C. Current air quality in Zone C is "good". The index is calculated based on the latest available measurements of PM₁₀, sulphur dioxide, nitrogen dioxide and ozone in Zone C.

3.6.1.2 Air Quality Monitoring

Air quality in Bray was monitored between 20th October 2005 and 11th May 2006 at the Health Service Executive, Killarney Road, Bray. Parameters measured included PM₁₀, Carbon Monoxide, Sulphur Dioxide, Oxides of Nitrogen, Benzene and Lead

3.6.1.3 Particulate matter (PM₁₀ and PM_{2.5})

Particulate matter (PM₁₀ and PM_{2.5}), or dust, arise from vehicle exhaust emissions, soil and road surfaces, construction works and industrial emissions. Small particles can penetrate the lungs and cause damage. These are known as PM₁₀ (diameter less than 10µm) and PM_{2.5} (diameter less than 2.5µm). There are high levels of PM₁₀ in many cities and towns.

3.6.2 Potential Point Sources of Emissions

3.6.2.1 IPPC Licensed Facilities

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

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

must be satisfied that emissions from the activity do not cause a significant adverse environmental impact.

There are two IPPC licensed facilities in Bray, A.O. Smith Electric Motors (Ireland) Limited and Alert Packaging Limited. These lie outside the Plan boundary.

Greenstar Ltd. operates an integrated waste management facility in the Fassaroe area. Greenstar Ltd. are licensed to carry out several different operations including bulking of municipal solid waste prior to transfer off site for disposal, composting, wood shredding, processing/storage of dry recyclables, recovery of construction and demolition waste, acceptance of waste at a civic waste facility to include acceptance of hazardous waste such as bonded asbestos waste, WEEE and chlorofluorocarbons.

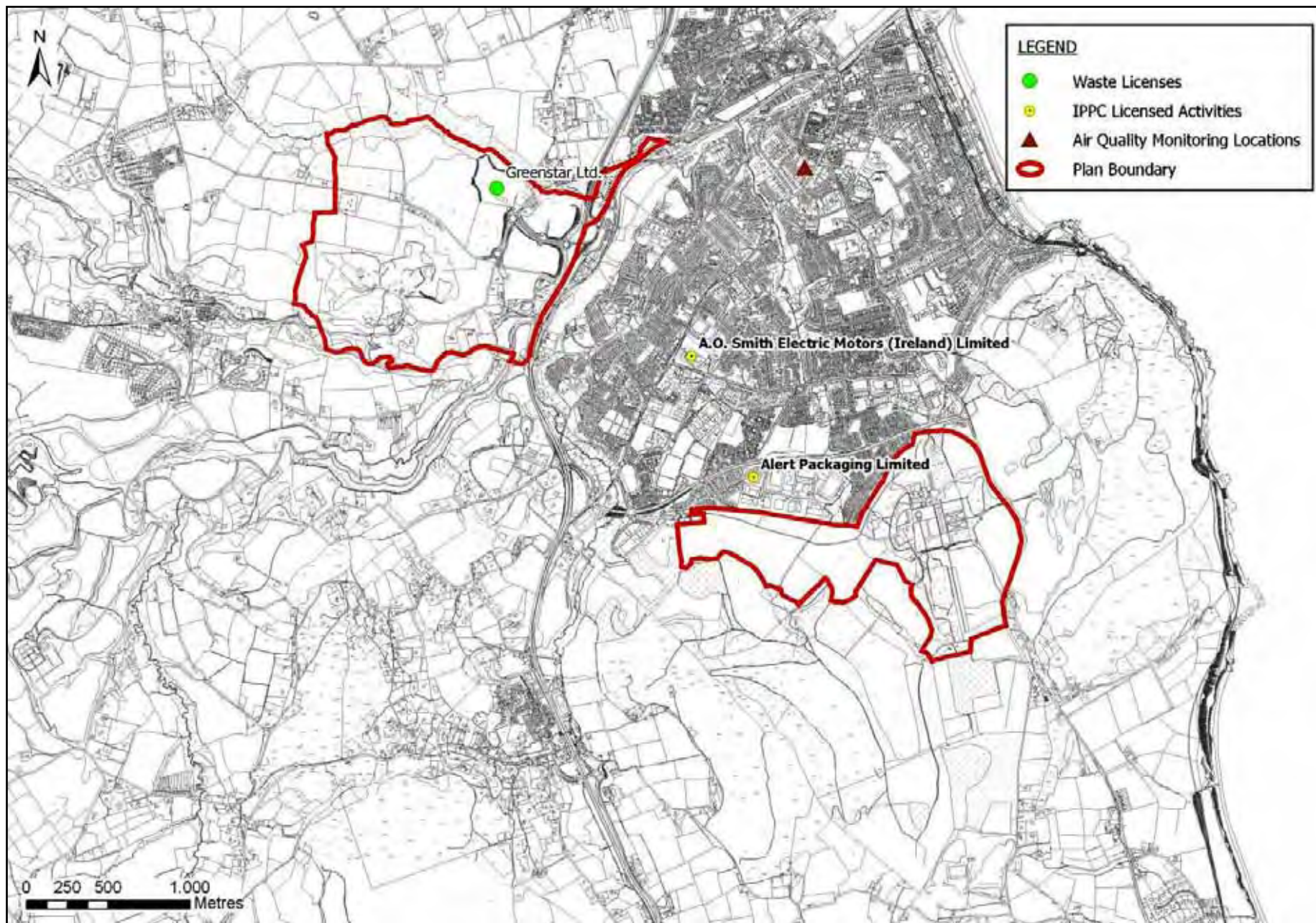


Figure 3.24 Waste Licences, IPPC Licences and Air Quality Monitoring Locations

3.6.3 Noise

The over-riding noise source which is relevant to the Fassaroe part of the Plan area is from movements of traffic along the M11 Motorway and N11 National Primary Route. This source could potentially cause a nuisance for residents, particularly in Fassaroe.

3.6.4 Climatic Factors

3.6.4.1 Greenhouse Gases

In order to reduce greenhouse gas emissions the internationally agreed Kyoto Protocol established emissions reduction targets for developing countries. Ireland's emission target for greenhouse gases is to limit the increase in their combined emissions during the five-year period 2008-2012 to 13 per cent above 1990 levels.

Transport continues to be the dominant growth sector with emissions at 682,000 tonnes higher in 2006 than in 2005. This represents a 5.2% increase on 2005 levels and 165% increase on the 1990 transport emissions. Road transport accounts for 97% of the transport sector emissions. The increase in the GHG emissions from the transport sector reflects sustained increases in fuel consumption with petrol usage up 3.4% and diesel consumption up 7.9% from the previous year⁹.

3.6.4.2 Climate Change

Climate change refers to any change in climate over time, whether due to natural variability or as a result of human activity.

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

⁹ EPA (2008) *Provisional figures for Ireland's 2006 Greenhouse Gas Emissions for the period 1990-2006* Wexford: EPA

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

3.6.4.3 Potential Effects of Changed Climate and Rising Sea Levels

The EPA's 'Climate Change: Scenarios and Impacts for Ireland' (2003) report identifies where vulnerability to climate change exists in Ireland and what adjustments are likely in the operation of environmental systems in response to such changes. The following potential effects are cited from this report.

- **Flooding and Erosion**

At the regional scale, the major effects of a sea level rise are loss of land as a consequence of increased erosion (due to changes in coastal currents and sedimentation rates) and inundation and increased risk of flooding (both at the coast and inland along major river networks during storm surge events). Flooding risk would also be enhanced if a storm surge is coupled with intense or long duration precipitation events.

Coastal floodplains are especially at risk on occasions when a high tide and storm surge couple with a period of intense rainfall lead to a breach in the carrying capacity of the drainage network, a situation in Ireland which has become evident over the last decade.

Sea level rise presents itself as a serious problem where there is infrastructure at risk of inundation.

As increased temperatures will lead to greater amounts of water vapour in the atmosphere and an accelerated global water cycle, it is reasonable to expect that river catchment areas will be exposed to a greater risk of flooding. The increase in winter precipitation will be likely to produce a significant increase in the more intense discharge episodes, raising the risk of future flooding.

The report identifies that although it is not possible to comment on changes in flood magnitude and frequency, the increase in winter runoff indicated for many parts of the west, especially under the scenario for the period 2061-2090, is likely to have significant implications. River flooding tends to be more

common during the wetter winter months when soils are near saturation and can be exacerbated in coastal areas when interactions occur between high tides and high flows.

The effect of a sea level rise on estuaries will tend to enlarge their vertical and horizontal extent, resulting in the penetration of tides further upstream. The outflow from rivers would be impeded as a consequence, which, in a high intensity rainfall event where runoff is high, would increase the risk of flooding. Estuarine systems, including that of the River Dargle, are important nursery and breeding areas for many commercial fish species.

Sea level rise in Bray Environs could result in changes to the ecologically designated sites located there as well as a changing of the landscape.

3.6.5 Existing Problems

Traffic, particularly along the N11 route is likely to have elevated levels of air pollution and noise due to traffic congestion. This provides a harsh sensory environment which may impact upon human health.

Localised air pollution incidences with regard to PM₁₀ and PM_{2.5} and noise pollution are both likely to occur when construction takes place.

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

Changes in sea level and/or changes in the occurrence of severe rainfall events as a result of climate change would be likely to increase the occurrence and magnitude of flooding events and inundation - this could result in damage and loss to houses and infrastructure.

As sea levels rise, so too will water levels of rivers. This could result in changes to the ecologically designated sites as well as a changing of the landscape.

3.6.6 Evolution of Air and Climatic Factors in the absence of a Local Area Plan

Increases in the number of cars as well as the increase in the volume and incidences of traffic congestion may lead to increases in air and noise pollution in the future.

The LAP provides an opportunity to minimise this by providing public transport and pedestrian routes within and between residential areas. This would help to reduce trip generation and promote the use of alternative modes of transport other than the car and would therefore be likely to generate less transport related greenhouse gas emissions. In the absence of an LAP this opportunity to prevent the generation of future transport related greenhouse gas emissions would be missed. In the absence of an LAP, the proposed extension to the Luas line may not be economically viable - without the LAP, development would be more dispersed and there would be no coherent strategy for the creation of employment opportunities.

3.7 Material Assets

3.7.1 Waste Water

3.7.1.1 Relevant Legislation

The Urban Waste Water Treatment Directive (91/271/EEC) (amended by Directive 98/15/EEC) aims to protect the environment from the adverse effects of the wastewater discharges by ensuring that wastewater is appropriately treated before it is discharged to the environment. Such treatment is essential in order to meet the requirements of the Water Framework Directive (see Section 3.5).

3.7.1.2 Waste Water Treatment

Waste water from the Bray area is currently subject to screening at the facility near Bray Harbour. It is then pumped into the Irish Sea through a long sea outfall. A Design, Build and Operate contract to upgrade the Shanganagh Waste Water Treatment Plant to provide full secondary treatment for wastewater from Shanganagh and Bray has been signed. The project will include laying a pipeline from Shanganagh wastewater treatment works to Bray. It is hoped that works will be complete by 2011/2012.

The existing Waste Water Treatment Plant at Bray will be kept a new stormwater tank will be built and the plant will be used as a fallback system.

The upgrading of the Shanganagh Waste Water Treatment Plant will improve coastal water quality and will meet the requirements of the EU Urban Wastewater Treatment Directive as mentioned above. It will also contribute to fulfilling Wicklow County Council's obligations under the Water Framework Directive.

3.7.1.3 Connection to Existing Network

The current sewer network in the Bray area does not extend to the Plan area. There is a pumping station to the west of the Fassaroe site near Enniskerry and another one at Kilmacanoge. Two possible access points to the sewage network have been identified, one at the north-eastern corner of the Fassaroe site and the other, which is not fixed in location, near Ballywaitrin, west of the Kilruddery site. This is mapped on Figure 3.25.

3.7.1.4 Capacity and Demand

Current waste water treatment capacity at the Bray Waste Water Treatment Plant is 35,000PE (population equivalent). Current demand exceeds this at 42,000PE. Capacity at the upgraded plant in Shanganagh will be 61,500 PE which is more than sufficient for the population provided for by the Plan.

3.7.2 Drinking Water

3.7.2.1 Water Supply

Water in the Plan area is provided by Dublin City Council. The Dublin Region Watermains runs through the Fassaroe site from the north, see Figure 3.26. Requests to increase the amount of water supplied to the Bray area have been made and granted in the past. It is envisaged that this will be the case regarding water supply for the Plan area. It is likely that a new high level water tower will be constructed to serve the Kilruddery area and provide additional supply to the Bray Town area. Continuing at a moderate level of growth, it is thought that maximum output will be reached by 2010, which is in excess of requirements, and continue until 2016. Problems relating to drinking water supply could arise in 2018.

Current water consumption for the Bray area stands at .4m³/day or 2.56m³/day based on occupancy levels.

3.7.2.2 Drinking Water Quality

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

Compliance with the drinking water requirements is determined by comparing the results of analyses submitted by water suppliers to the standard for 48 parameters specified in the European Communities (Drinking Water) Regulations (No. 2), 2007. To ensure that these standards are met each water supply must be monitored on a regular basis.

Under Section 58 of the Environmental Protection Agency Act 1992 the EPA is required to collect and verify monitoring results for all water supplies in Ireland covered by the European Communities (Drinking Water) Regulations, 2000. The EPA publishes their results in annual reports.

The overall rate of compliance in Wicklow County Council, 95.0%, was below the national average during 2006. This was mainly due to below average microbiological compliance in the private water supplies.

3.7.3 Waste Management

Greenstar currently operate an integrated waste management facility in the Fassaroe area. Waste is separated and sent off the appropriate recycling facilities.

The license allows several different operations to be carried out at the depot, which include:

- bulking of municipal solid waste prior to transfer off-site for disposal;
- in-vessel composting of biodegradable waste;
- wood shredding;
- processing/storage of dry recyclables;
- recovery of construction and demolition waste; and,
- acceptance of waste at a civic waste facility which includes acceptance of hazardous waste such as bonded

asbestos waste, WEEE and chlorofluorocarbons.

It is the intention of Greenstar to have all operations indoors.

Roadstone currently have applied for planning permission for the sorting of construction and demolition waste on site.

Ballynagran landfill accepts 150 tonnes of waste from the Bray area each year. If the current rate of waste being sent there continues there is 15-20 years capacity left. There is capacity of 3-5 years remaining at the landfill facility at Rampere if the existing rate of waste is sent there at 50 tonnes per year.

3.7.4 Vehicular Circulation

The North Bray and Environs Land Use and Transportation Study which was carried out in 2006 encompassed Woodbrook, Rathmichael, Old Connaught, Fassaroe and North Bray. It recommended a scheme of road improvements focused on improving access into the areas west of the M11, and into Bray Town Centre via the Dublin Road; and the development of a cycle network connecting Fassaroe, Old Connaught, Woodbrook and Rathmichael with Bray Town Centre, Cherrywood and DART.

The N11 National Primary Road links the Plan area to Dublin via the M11 Motorway. This route facilitates the movement of commuters into the Greater Dublin Area. It is noted that a previous application for development of the Fassaroe area failed on the basis that current N11 access arrangements are inadequate.

A Rapid Transit Strategy is developed incorporating a LUAS extension from Cherrywood to Fassaroe, and a Bus Rapid Transit link from Fassaroe and Old Connaught to Bray Town Centre, including a Park and Ride at Fassaroe. Progress is being made on the proposal for the extension of the Luas. A Draft EIS Scoping Report has been carried out for the B2 line¹⁰.

3.7.5 Existing Problems

There is inadequate wastewater treatment capacity for existing development and no capacity for further development with the existing plant overloaded. This represents a significant existing environmental problem which is likely to be adversely impacting upon Wicklow County Council's ability to meet its commitments under the Water Framework Directive (see Section 3.5.3). The upgrading of the waste water treatment plant at Shanganagh will help to solve this problem and enable future population growth.

In order to accommodate recent and future growth, the new waste water treatment plant, increased water supply and additional transport infrastructure etc. are needed. Such infrastructural projects or programmes are likely to have significant adverse impacts on the environment if not mitigated. These projects or programmes may require environmental assessments to be carried out on them in order to prevent such impacts.

3.7.6 Evolution of Material Assets in the absence of a Local Area Plan

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

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

Capacity of the waste water treatment plant to which waste water arising from dispersed new populations and existing populations would be in adequately treated until the plant at Shanganagh was in operation.

¹⁰ RPA Luas Line B2, Cherrywood to Bray Area, Environmental Draft Scoping Report, April 2008.

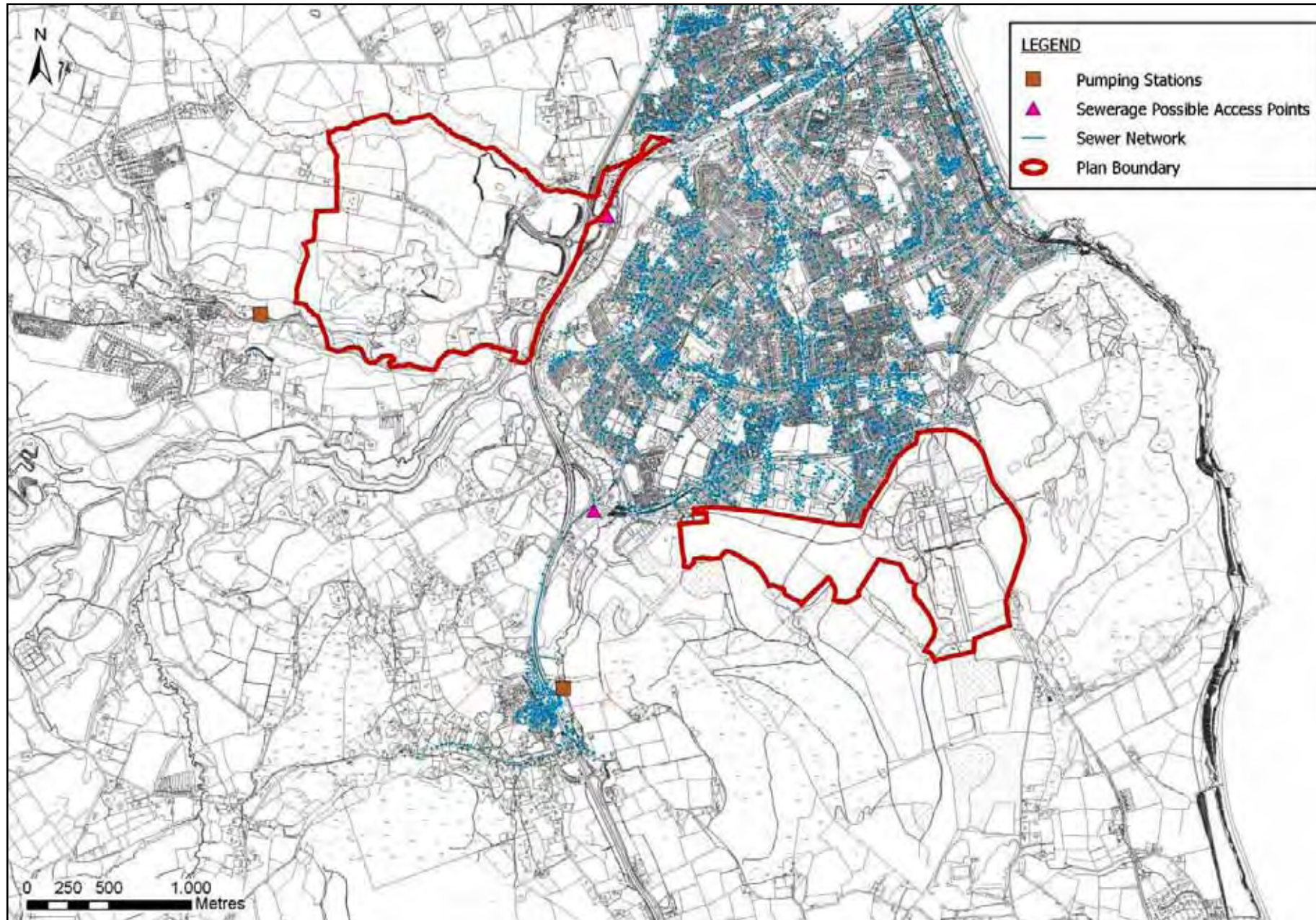


Figure 3.25 Existing Waste Water Collection Infrastructure

CAAS for Wicklow County Council

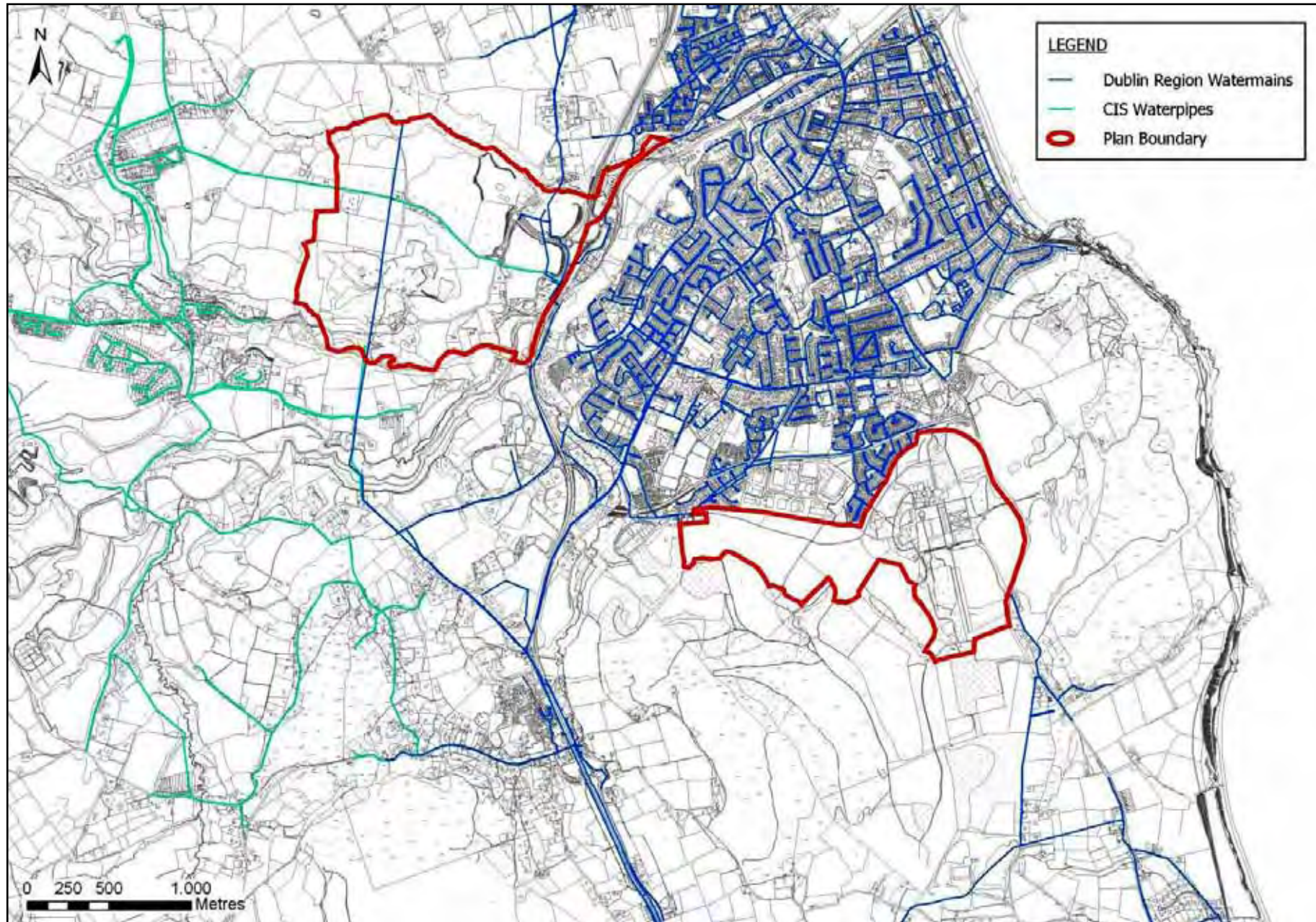


Figure 3.26 Existing Water Distribution Infrastructure

CAAS for Wicklow County Council

3.8 Cultural Heritage

3.8.1 Introduction

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

The heritage of Bray Environs is a unique resource which is fundamental to the cultural identity of the area and the quality of life of its citizens - it is central to how we see ourselves and to our identity as individuals and communities. Historic buildings can define localities and communities within the area and can become a focus of community identity and pride. An historic church or park, for example, can help define a neighbourhood and create a sense of local cohesion.

3.8.2 Archaeological Heritage

3.8.2.1 Introduction

Archaeology is the study of past societies through the material remains left by those societies and the evidence of their environment. Archaeological heritage consists of such material remains (whether in the form of sites and monuments or artefacts in the sense of moveable objects) and environmental evidence. As archaeological heritage can be used to gain knowledge and understanding of the past it is of great cultural and scientific importance. Archaeological sites and monuments vary greatly in form and date; examples include earthworks of different types and periods, (e.g. early historic ringforts and prehistoric burial mounds), megalithic tombs from the Prehistoric period, medieval buildings, urban archaeological deposits and underwater features such as wrecks.

Archaeological sites may have no visible surface features; the surface features of an archaeological site may have decayed completely or been deliberately removed but archaeological deposits and features may survive beneath the surface.

Archaeology in its various forms ranging from fragmentary buried remains to the fabric and contents of modern domestic and industrial buildings is a vital component of the culture, conservation and development of Bray Environs.

3.8.2.2 Record of Monuments and Places

The term 'monument' includes all man-made structures of whatever form or date except buildings habitually used for ecclesiastical purposes. All monuments in existence before 1700 A.D. are automatically considered to be historic monuments within the meaning of the Acts. Monuments of architectural and historical interest also come within the scope of the Acts. Monuments include: any artificial or partly artificial building, structure or erection or group of such buildings, structures or erections; any cave, stone or other natural product, whether or not forming part of the ground, that has been artificially carved, sculptured or worked upon or which (where it does not form part of the place where it is) appears to have been purposely put or arranged in position; any, or any part of any, prehistoric or ancient tomb, grave or burial deposit, or, ritual, industrial or habitation site; and any place comprising the remains or traces of any such building, structure or erection, any such cave, stone or natural product or any such tomb, grave, burial deposit or ritual, industrial or habitation site, situated on land or in the territorial waters of the State', but excludes 'any building or part of any building, that is habitually used for ecclesiastical purposes'.

A recorded monument is a monument included in the list and marked on the map which comprises the Record of Monuments and Places (RMP) set out county by county under Section 12 of the National Monuments (Amendment) Act, 1994 by the Archaeological Survey of Ireland. The definition includes Zones of Archaeological Potential in towns and all other monuments of archaeological interest which have so far been identified.

St. Valery's Cross is in the Fassaroe area and is listed on the RMP. There is also a *font* at this location which is also listed on the RMP. Fassaroe Castle, built in 1536, is located to the south of the Fassaroe site about 25 meters to the south east of the road leading into Roadstone. This suggests there may be other archaeological sites which could possibly be uncovered in the development process, especially as the Fassaroe area is predominantly

comprised of greenfield sites. There is also a *burial site* within the Fassaroe area at the Roadstone site. There is a “*redundant record*”¹¹ listed to the south of Fassaroe Castle.

Within Kilruddery Demesne, there are two *designated landscape features*, a *possible burial ground* as well as Kilruddery House itself. To the west of the House there are two *Fulacht Fia*s listed on the RMP.

Figure 3.27 maps the location of entries to the Record of Monuments and Places within and surrounding the Plan area.

3.8.3 Architectural heritage

3.8.3.1 Introduction

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.

There are two entries to the NIAH within the Plan area, namely Kilruddery House, Registration Number: 16400816 and its Gate Lodge Registration Number: 16400817. Kilruddery House is a detached multiple-bay part single part two part three and part four-storey Mansion, originally dating from the 17th century, but remodelled and extended in 1820 in Elizabethan style to designs by Sir Richard Morrison. Though part demolished in the 1950s, this building is still one of the finest examples of the Elizabethan Rural style in the country, much popularised by the Morrisons in the early 19th century. It is also listed on the Record of Protected Structures. The gate lodge, a detached three-bay single-storey former gate

lodge, built c.1850, is set adjacent to the demesne main entrance. Despite the reordering and the loss of some original detail this mid 19th-century gate lodge adds to the group value of the demesne.

3.8.3.2 Record of Protected Structures

The Record of Protected Structures (RPS) included in the current Local Area Plan is legislated for under Section 51 of the Planning and Development Act 2000. Figure 3.28 maps these structures.

Protected Structures are defined 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.

In relation to a protected structure or proposed protected structure, the following are encompassed:

- (i) the interior of the structure
- (ii) the land lying within the curtilage¹² of the structure;
- (iii) any other structures lying within that curtilage and their interiors; and
- (iv) all fixtures and features which form part of the interior or exterior of any structure or structures referred to in subparagraph (i) or (iii).

There are four structures within the Plan area which are listed on the Record of Protected Structures. In the Fassaroe area, there are two country houses. Structure Number: 03-32 is a three-bay, two-storey villa with painted rendering, raised quoins, hipped roof with eaves, pedimented, ionic porch. A house of circa 1820, attributed to Sir Richard Morrison. Structure number 03-34 in the Dargle Valley is an early, gothic-revival house of circa 1810, with a crenellated tower at the south end and a

¹¹ Records classed as “Redundant record” are those that fulfil one or more of the following criteria: (1) a record identifying a location where, according to literature or personal communication, a monument existed, but which, on inspection, was found not to be an archaeological monument (e.g. a natural feature); (2) a record classified using a term which is now obsolete (e.g. ecclesiastical remains); (3) a record created in the database for which there is no supporting evidence recorded on file or in the database; (4) an archaeological object (i.e. an artefact), e.g. a quernstone; (5) a record entered as a Shipwreck.

¹² Curtilage is normally taken to be the parcel of ground immediately associated with the Protected Structure, or in use for the purposes of the structure. Protection extends to the buildings and land lying within the curtilage. While the curtilage sometimes coincides with the present property boundary, it can originally have included lands, features or even buildings now in separate ownership, e.g. the lodge of a former country house, or the garden features located in land subsequently sold off. Such lands are described as being attendant grounds, and the protection extends to them just as if they were still within the curtilage of the Protected Structure.

large, pointed, mullioned window, also attributed to Sir Richard Morrison.

RPS number 08-33 Kilruddery House and RPS number 08-34 Kilruddery House entrance Gates lay within the Plan area at Kilruddery. Kilruddery House is an important early-19th Century house by William Vitruvius Morrison now partially truncated. The exterior is tudor-gothic revival and the interior a lush neo-classicism. The garden layout dates from the seventeenth Century. The entrance gates and piers were designed by William Morrison.

3.8.4 Existing Environmental Problems

The integrity of the historic gardens and setting of Kilruddery Demesne may be compromised by encroaching development.

Archaeology can be previously unknown but can be damaged through development causing ground disturbance.

Development which involves material alteration or additions to protected structures can detract from the special character of the structure and its setting, and have the potential to result in the loss of features of architectural or historic interest and the historic form and structural integrity of the structure are retained. Development on sites adjoining protected monuments, places or structures can also impact upon the setting of these cultural heritage items.

The cumulative accommodation of large scale development in Bray Environs has the potential to cumulatively impact upon cultural heritage of the Plan area.

3.8.5 Evolution of Cultural Heritage in the absence of a Local Area Plan

In the absence of Local Area Plan, the evolution of cultural heritage would be dependent on developments which take place. Such development would have no guidance as to where to be directed and planning applications would be assessed on an individual basis with cultural heritage protected under a number of strategic actions relating to archaeological and architectural protection.

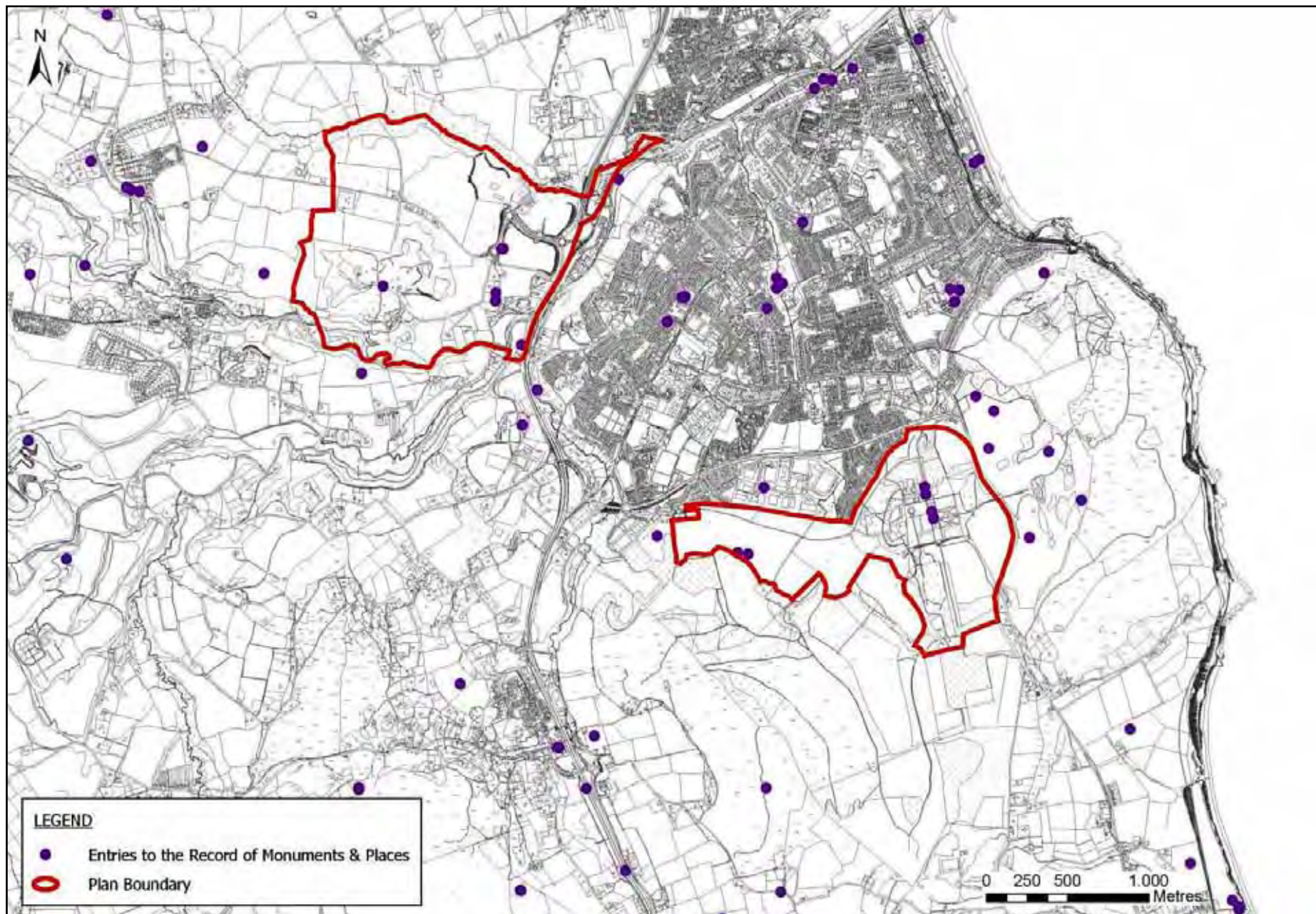


Figure 3.27 Archaeological Heritage: Entries to the Record of Monuments and Places
CAAS for Wicklow County Council

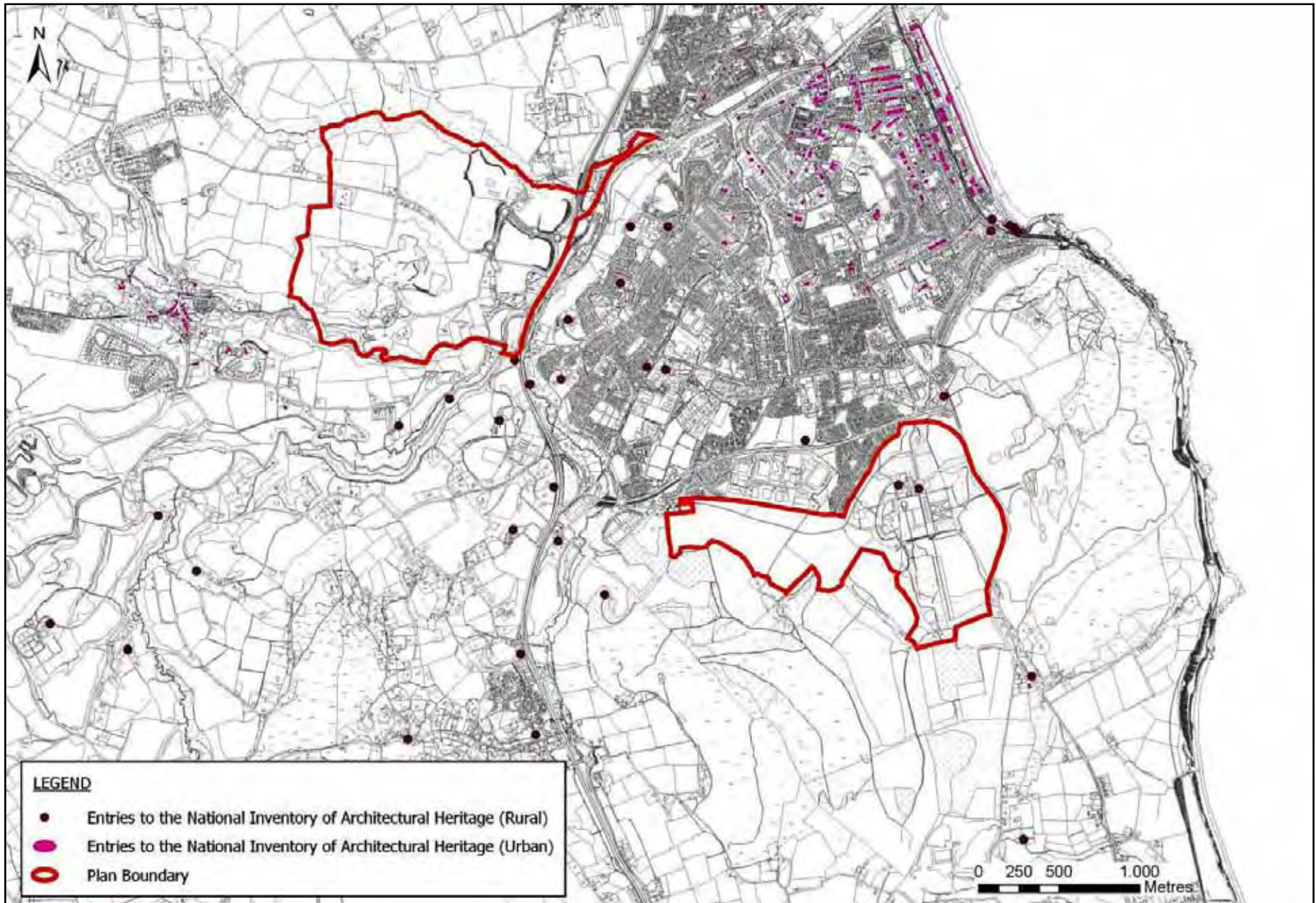


Figure 3.28 Architectural Heritage: Entries to the National Inventory of Architectural Heritage

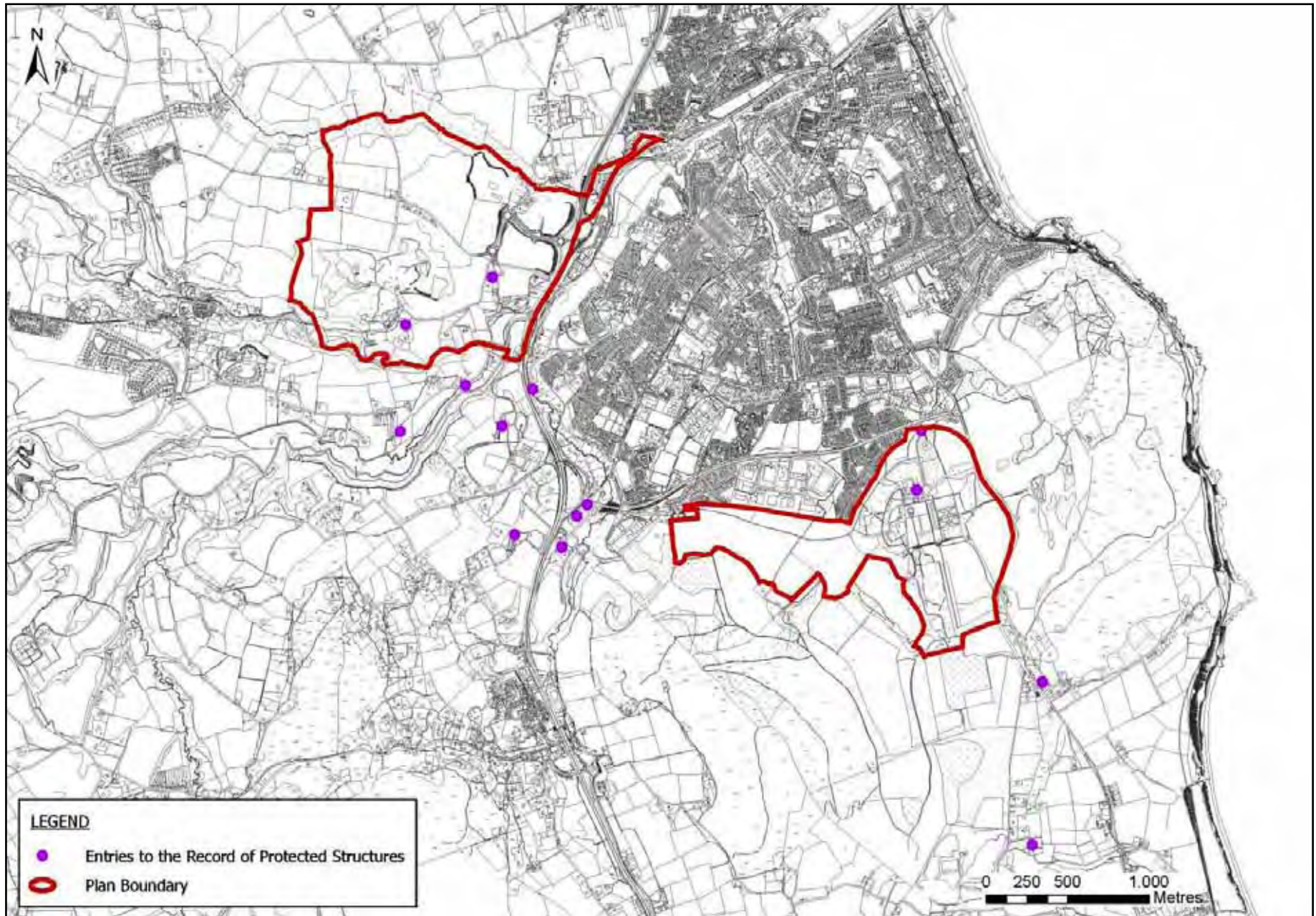


Figure 3.29 Architectural Heritage: Entries to the Record of Protected Structures

CAAS for Wicklow County Council

3.9 Landscape

3.9.1 Introduction

Landscapes are areas which are perceived by people and are made up of a number of layers: landform, which results from geological and geomorphological history; land cover, which includes vegetation, water, human settlements, and; human values which are a result of historical, cultural, religious and other understandings and interactions with landform and land cover. The Wicklow County Development Plan cited the landscape particularly in the North East of the county as being vulnerable to development pressure, which threatens its intrinsic character.

3.9.2 Landscape Characterisation ¹³

3.9.2.1 Introduction

Wicklow County Council's Landscape Characterisation (2004) classifies landscapes in Wicklow according to their sensitivity – their ability to accommodate change or intervention without suffering unacceptable effects to character and values. The most sensitive landscapes are *Areas of Outstanding Natural Beauty* - which are of a very high sensitivity - and *Areas of Special Amenity* - which are of a high sensitivity. Landscapes of lesser sensitivity are *Rural Areas* and *Corridor Areas* which are both of medium sensitivity.

These landscape areas are shown on Figure 3.30 and are named below.

3.9.2.2 Areas of Outstanding Natural Beauty

The Areas of Outstanding Natural Beauty (AONB) zone encompasses those areas which are most vulnerable and sensitive, and which are considered to be of greatest scenic value. These areas tend to be under severe development pressure. The areas of Fassaroe, Giltspur and Kilruddery Demesne East are Areas of Outstanding Natural Beauty.

¹³ Text in this section is taken from Wicklow County Council (2004) *Wicklow County Development Plan 2004 – 2010 County Landscape Characterisation* Wicklow: Wicklow County Council

3.9.2.3 Areas of Special Amenity

This landscape zone encompasses those areas which, whilst not as vulnerable nor as sensitive as those areas in the AONB zone, are still subject to pressure for development which could result in a serious deterioration in the landscape quality. The sensitivity of these areas is made more pronounced by the fact that they act as an effective “gateway” to the more remote and wild upland areas and because the more ameliorative nature of the landform ensures that there is greater development pressure.

3.9.2.4 Rural Areas

The rural area landscape zone is located along the western and southern extremities of the County. Whilst the landform, to some extent, corresponds to that found in Carlow and Kildare, it differs considerably in that, relative to their elevation, this land can be described as gently rolling and undulating and could really only be described as lowlying when compared to the rest of the terrain in County Wicklow. The area is very rural and is characterised by only a few small towns and villages.

3.9.2.5 Corridors Areas

This landscape zone covers main access corridors in the County. The boundaries generally follow what is considered to be the areas upon which the greatest influence is exerted by these access routes. These routes, for the most part, run through the more low lying and accessible tracts of land and connect the major towns. These corridors are under intense pressure from residential and other sporadic development. The majority of the Kilruddery area lies within a corridor zone with the remainder of the Kilruddery area falling into an Area of Outstanding Natural Beauty.

3.9.3 Special Amenity Area Orders

A Special Amenity Area Order (SAAO) is designed to protect areas that are of particularly high amenity value, which are sensitive to intense development pressure and which cannot be adequately protected by existing planning controls. An SAAO for Bray Head was drawn up in 2007. Areas Considered for an SAAO include the Dargle Glen, The Little Sugar Loaf, The Great Sugar Loaf.

3.9.4 Views and Prospects of Special Amenity and Value

There are a number of views and prospects identified in the Wicklow County Development Plan. Protected views and prospects within and surrounding the Plan area are mapped on Figure 3.31 and are listed below:

Views of Special Amenity Value or Special Interest:

1. R117 at The Scalp, Enniskerry: View of Sugarloaf Mountains and Enniskerry
2. C6/L5507-0 Ballyman Road, Enniskerry Road/L5507-0: View of The Scalp and the Scalp Valley from the Ballyman Road.
3. N11 Kilmacanogue: View of Little Sugarloaf
4. R761 Windgates Coast Road: View of Little Sugar Loaf.
5. Cliff Road Windgates: View of Coast, Greystones and foreground of Bray Head.
6. R761 Windgates Coast Road: View of Bray Head.
7. R761 North of Greystones: View northwards to Bray Head and southwards of sea and built up area of Greystones.

Prospects of Special Amenity or Special Interest:

1. C33 and C19 at Rocky Valley Drive: Prospect of Bray, Powerscourt and Enniskerry.
2. R755 Rocky Valley, Kilmacanogue: Prospects of both sides of Rocky Valley Kilmacanogue.
3. C29 Little Sugarloaf, Kilmacanogue: Prospect of Little Sugarloaf and the Coast.
4. Southern Cross Road: Prospect of Bray Head from Southern Cross Road.
5. R761 North of Greystones: Prospect of Bray Head from R761 towards Bray Golf Course.
6. Bray-Greystones Cliff Walk: Prospect of sea, cliffs and across southern slopes to Bray Head to R761 from Cliff Walk.

3.9.5 Existing Environmental Problems

A problem with regard to the environmental component of landscape is the cumulative visual impact which occurs as a result of developments such as one off houses. Such developments, which individually often do not have significant adverse impacts, have the potential to cumulatively and adversely significantly impact upon sensitive landscapes. This is especially problematic in the visually prominent, elevated parts of the Plan area including the foot of the Little Sugar Loaf at Kilruddery, where lands are threatened by encroaching development and lands at the centre of the Fassaroe area.

The landfills to the north of the Fassaroe site have been capped which lessens their visual impact on the landscape.

The area including Fassaroe is classified under the Wicklow County Development Plan 2004-2010 County Landscape Characterisation as being within an *Area of Outstanding Natural Beauty*. This classification indicates that the lands are of a high sensitivity and value on a County level however it is noted that the validity of the designation in the Fassaroe area has largely been eroded in the past by the existing sand and gravel pit as well as more recent development close to the N11.

3.9.6 Evolution of Landscape in the absence of a Local Area Plan

In the absence of a Local Area Plan, development would be likely to occur on a one-off, dispersed basis. As outlined above, this would have cumulative impacts on the landscape.

Encroachment at the foot of the Little Sugar Loaf would continue uncontrolled.

The absence of a Local Area Plan may see the expansion of a semi-urban footprint of Bray Town and perhaps the coalescence of Bray, Enniskerry, Kilmacanogue and Greystones.

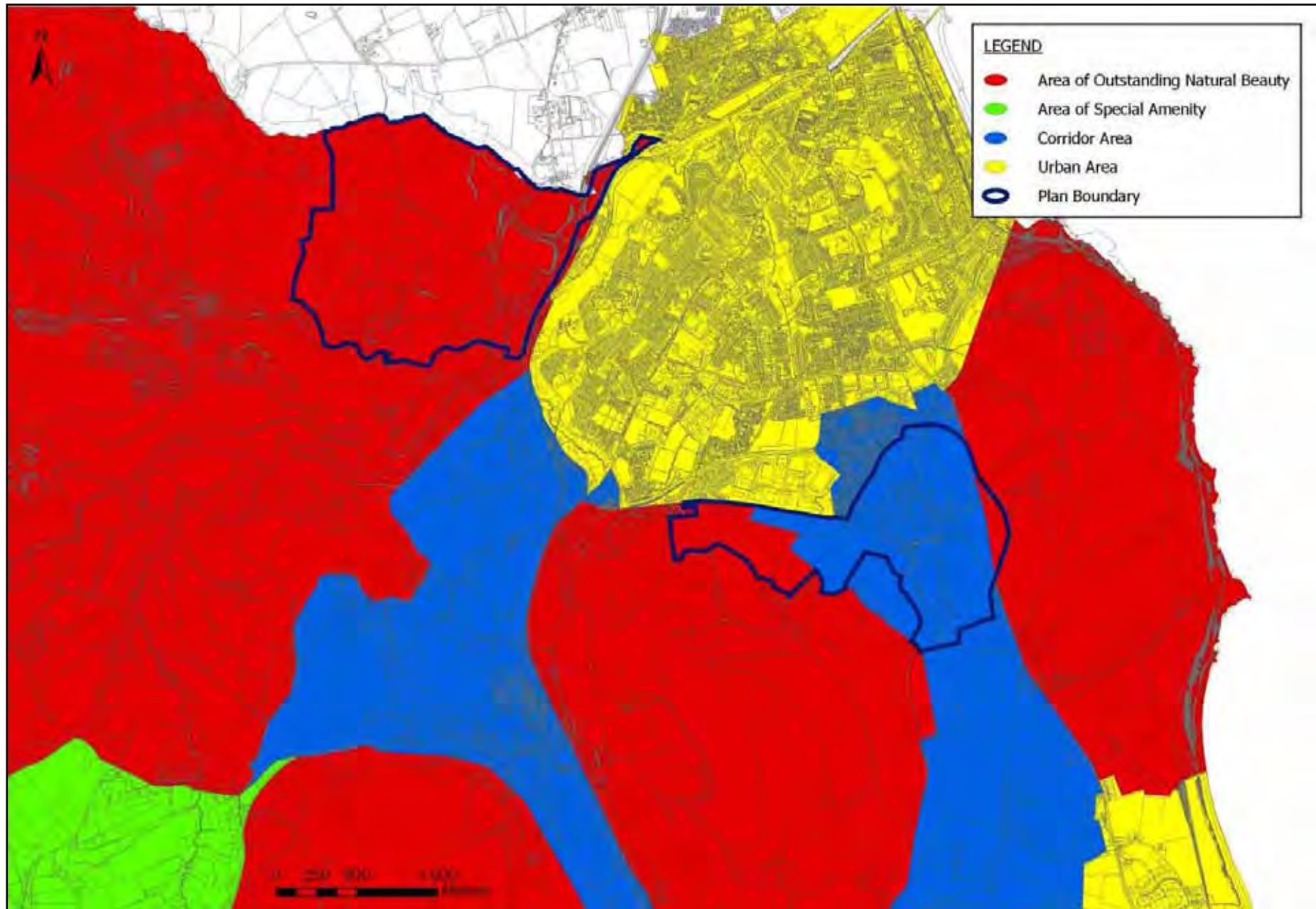


Figure 3.30 Landscape Characterisation

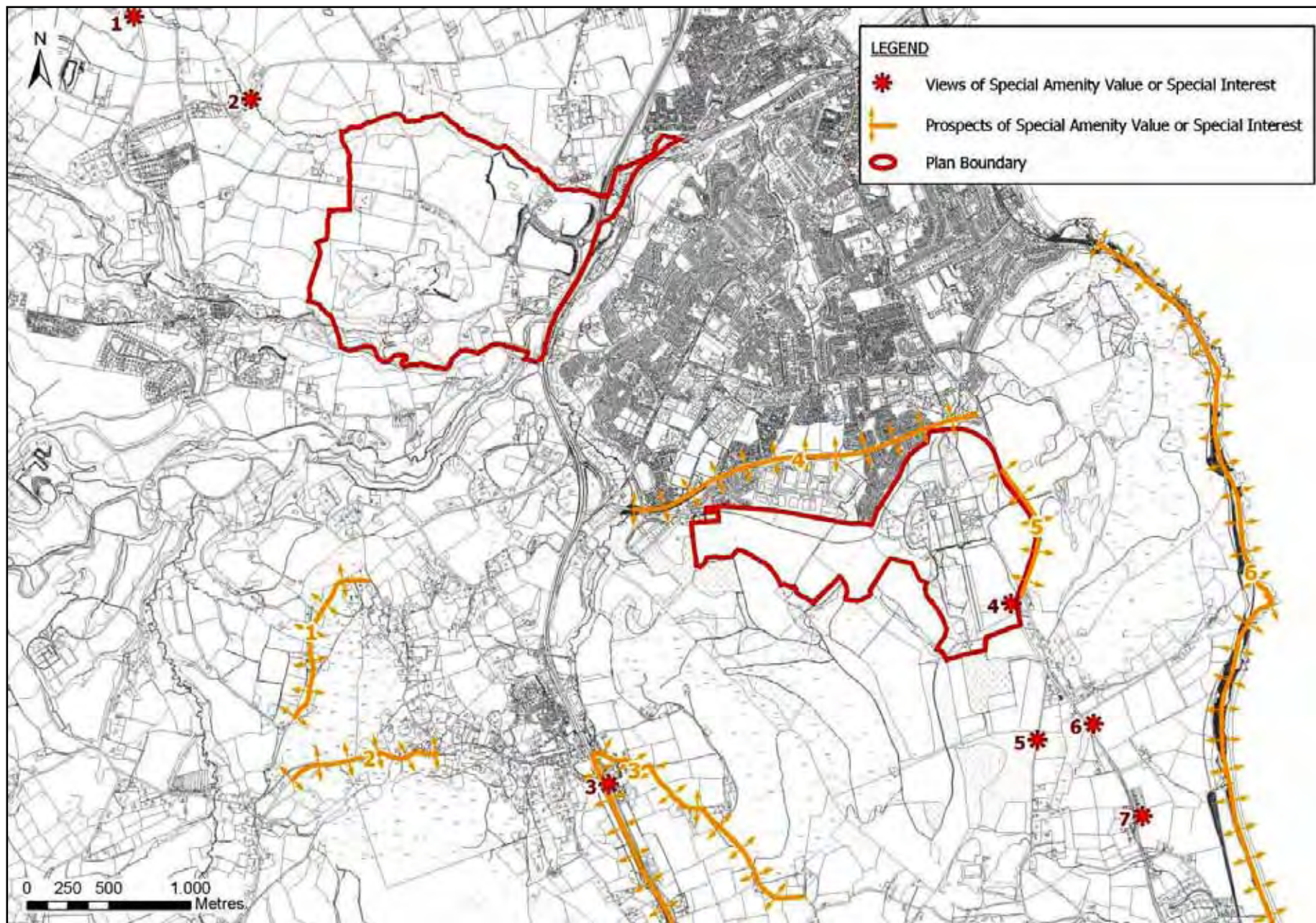


Figure 3.31 Views and Prospects of Special Amenity Value or Interest

Section 4 Strategic Environmental Objectives

4.1 Introduction

Strategic Environmental Objectives (SEOs) are methodological measures against which the environmental effects of the Local Area Plan (LAP) can be tested. If complied with in full, SEOs would result in an environmentally neutral impact from implementation of the Plan. The SEOs are set out under a range of topics and are used as standards against which the provisions of the LAP can be evaluated in order to help identify areas in which significant adverse impacts are likely to occur, if unmitigated.

SEOs are distinct from the objectives of the LAP - although they will often overlap - and are developed from international, national and regional policies which generally govern environmental protection objectives. Such policies include those of various European Directives which have been transposed into Irish law, relevant other Irish environmental legislation and the policies of the Wicklow County Development Plan 2005 to 2011, all of which are intended to be implemented at the local level in the Bray Environs area and integrated into any LAP for the area.

The SEA Directive requires that the evaluation of plans be focused upon the relevant aspects of the environmental characteristics of areas likely to be significantly affected. In compliance with this requirement, the SEA has focused upon the most relevant aspects of the environmental characteristics within and surrounding Bray Environs. SEOs relating to these environmental characteristics have been developed throughout the SEA. Most attention has been given to environmental components which are likely to be impacted as a result of implementation of a LAP.

SEOs are linked to indicators which can facilitate monitoring the likely significant effects of implementing the LAP, as well as to targets which the LAP can help work towards.

The primary source used in formulating the SEOs was Table 4B of the SEA Guidelines

(DEHLG, 2004)¹⁴. This list has been amended to give affect to objectives that are considered relevant to this LAP. The use of SEOs, although not a statutory requirement, does fulfil obligations set out in Schedule 2B of the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (SI No. 436 of 2004).

4.2 Biodiversity, Flora and Fauna

4.2.1 International, European and National Strategic Actions

4.2.1.1 UN Convention on Biological Diversity 1992

The United Nations Convention on Biological Diversity 1992 requires the promotion of the conservation and sustainable use of biodiversity.

4.2.1.2 National Biodiversity Plan 2002

The preparation and implementation of Ireland's National Biodiversity Plan 2002¹⁵ complies with an obligation under the UN Convention on Biological Diversity. The overall goal of the Plan is to secure the conservation, including where possible the enhancement and sustainable use of biological diversity in Ireland and to contribute to conservation and sustainable use of biodiversity globally. Objectives following on from this goal are to:

- Conserve habitat diversity, including all sites of special biodiversity importance;
- Conserve species diversity;
- Conserve genetic diversity, both wild and domesticated; and
- Contribute to the conservation and sustainable use of biodiversity and to

¹⁴ DEHLG (2004) *Implementation of SEA Directive (2001/42/EC): Guidelines for Regional Authorities and Planning Authorities* Dublin: Government of Ireland.

¹⁵ Department of Arts, Heritage, Gaeltacht and the Islands (2002) *National Biodiversity Plan* Dublin: Government of Ireland

advancing other obligations of the CBD in the EU, regionally and internationally.

4.2.1.3 Habitats Directive 1992

The European Council Directive on the Conservation of natural habitats and of wild fauna and flora (92/43/EEC), referred to as the Habitats Directive, aims to ensure the conservation of certain natural habitats and species which are at favourable conservation status. Article 10 of the Habitats Directive recognises the importance of ecological networks as corridors and stepping stones for wildlife, including for migration, dispersal and genetic exchange of species of flora and fauna. The Directive requires that ecological connectivity and areas of ecological value outside the network of designated ecological sites are maintained and it recognises the need for the management of these areas through land use planning and development policies.

Special Areas of Conservation (SACs) are designated and protected under the under the Habitats Directive 1992 (92/43/EEC) due to their conservation value for habitats and species of importance in the European Union. In Ireland, the habitats and species occurring in SACs are protected from effects of development occurring outside their boundaries under Section 18 "Prohibition of works on lands outside a European site" of the European Communities (Natural Habitats) Regulations 1997. The Regulations require that where a development is proposed to be carried out, on any land that is not within a protected site and is liable to have an adverse impacts on the protected site in question, including direct, cumulative and indirect impacts, an appropriate assessment, which conforms to an environmental impact assessment, of the likely effects of the proposed development on the site is undertaken. Depending on the conclusions of this assessment such development may be refused planning permission.

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 Special Protection Areas (SPAs) designated under the 1979 Birds Directive, form Natura 2000.

4.2.1.4 Wildlife Act 1976 and Wildlife (Amendment) Act 2000

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

4.2.1.5 European Freshwater Directive 1978

Salmonid Waters are designated and protected under the European Communities (Quality of Salmonid Waters) Regulations 1998 (SI No. 293 of 1988) which implements the European Council Directive on the quality of fresh waters needing protection or improvement in order to support fish life (78/659/EEC), referred to as the European Freshwater Directive as amended and codified. Salmonid Water designation imposes an obligation to maintain specific water quality standards and control pollution.

4.2.2 SEOs, Indicators and Targets

The following SEOs, Indicators and Targets for Biodiversity and Flora and Fauna have been developed with regard to the environmental baseline of the Plan area and the objectives of the above strategic actions.

SEO B1:	To avoid loss of relevant habitats, geological features, species or their sustaining resources in designated ecological sites
Indicator B1:	Percentage of relevant habitats and designated ecological sites lost as a result of implementation of the LAP
Target B1:	No losses of relevant habitats, species or their sustaining resources in designated ecological sites as a result of implementation of the LAP

SEO B2:	To avoid significant adverse impacts, including direct, cumulative and indirect impacts, to relevant habitats, geological features, species or their sustaining resources in designated ecological sites by development within or adjacent to these sites
Indicator B2:	Number of significant adverse impacts, including direct, cumulative and indirect impacts, to relevant habitats, geological features, species or their sustaining resources in designated ecological sites by development within or adjacent to these sites as a result of implementation of the LAP
Target B2:	No significant adverse impacts, including direct, cumulative and indirect impacts, to relevant habitats, geological features, species or their sustaining resources in designated ecological sites by development within or adjacent to these sites as a result of implementation of the LAP

SEO B3:	To sustain, enhance or - where relevant - prevent the loss of ecological networks or parts thereof which provide significant connectivity between areas of local biodiversity
Indicator B3:	Percentage loss of connectivity between areas of local biodiversity as a result of implementation of the LAP - as evidenced from a resurvey of CORINE mapping
Target B3:	No ecological networks or parts thereof which provide significant connectivity between areas of local biodiversity to be lost without remediation as a result of implementation of the LAP

Note: the impact of implementing the LAP on aquatic biodiversity and flora and fauna is also influenced by impacts upon the quality of rivers and transitional waters which relate to SEO W1.

4.3 Population and Human Health

4.3.1 Population

The impacts of implementing the LAP on both the spatial distribution of population and the nature of development (with regard to greenfield and brownfield development) within the Plan area relates to SEO S1 which aims to maximise sustainable brownfield development in line with high level forward planning policy.

4.3.2 Human Health

The impact of implementing the LAP upon human health will be determined by the condition of environmental vectors into which the new population provided for by the Plan will come into contact with.

The condition of these vectors will be determined by past, existing and new land uses (such as old landfills) and by the extent to which new development is accompanied by appropriate infrastructure (such as waste water treatment infrastructure).

Emission limits for discharges to air, soil and water are set with regards to internationally recognised exposure limit values. These are generally set to be many times the safe exposure limit - in order to provide protection.

4.3.3 SEOs, Indicators and Targets

SEO HH1:	To protect human health from hazards or nuisances arising from exposure to incompatible landuses
Indicator HH1:	Occurrence (any) of a spatially concentrated deterioration in human health
Target HH1:	No spatial concentrations of health problems arising from environmental factors

4.4 Soil

4.4.1 Proposal for a Soil Framework Directive

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

Article 5 of the proposed Directive states that, for the purposes of preserving the various functions of soil; sealing, the development of artificial surfaces on top of soil resources, should be limited. The proposed Directive suggests that this may be achieved through rehabilitating brownfield sites, thus reducing the depletion of greenfield sites. The proposed Directive also states soil should be used in a sustainable manner which preserves its capacity to deliver ecological, economic and social services, while maintaining its functions so that future generations can meet their needs.

4.4.2 SEOs, Indicators and Targets

The following SEO, Indicator and Target for Soil have been developed with regard to the environmental baseline of the Plan area, the proposed Soil Directive and certain land use strategic actions detailed under Section 5.2 *Interactions with Relevant Planning Policy*.

SEO S1:	Maximise the sustainable re-use of brownfield lands, and maximise the use of the existing built environment rather than developing greenfield lands
Indicator S1:	Area of brownfield land developed over the Plan period
Target S1:	Reduced availability of brownfield land (subject to availability on the open market, the demand for such land and the ability for such lands to be sustainably re-used within the provisions of the LAP) at the end of the LAP lifespan

Note: the impact of implementing the LAP on soil quality is influenced by impacts, upon in particular, ground water bodies which relate to SEO W2.

4.5 Water

4.5.1 The Water Framework Directive 2000

4.5.1.1 Introduction

Since 2000, Water Management in the EU has been directed by the Water Framework Directive 2000/60/EC (WFD). The WFD has been transposed into Irish legislation by the European Communities (Water Policy) Regulations 2003 (SI No. 722 of 2003). The WFD requires that all member states implement the necessary measures to prevent deterioration of the status of all waters - surface, ground, estuarine and coastal - and protect, enhance and restore all waters with the aim of achieving good status by 2015.

4.5.1.2 Good Status for Surface Waters

Good status as defined by the WFD equates to approximately Q4 in the national scheme of biological classification of rivers and mesotrophic in the trophic classification of lakes, as set out by the EPA.

4.5.1.3 Good Status for Transitional Waters

Good status as defined by the Water Framework Directive can be attained by transitional waters through the achievement of *unpolluted* status in the Assessment of Trophic Status of Estuaries and Bays in Ireland (ATSEBI) System which is used by the EPA in order to classify the quality status of transitional waters.

4.5.1.4 Quality Standards and Threshold Values for Ground Water

Detailed provisions to achieve the aims of the WFD for ground water have been presented in a Groundwater Daughter Directive (Directive 2006/118/EC on the protection of groundwater against pollution and deterioration).

This Directive sets up environmental objectives of good groundwater quantitative and chemical status, as well as ensuring a continuity to the 1980 Groundwater Directive (Directive 80/68/EEC on the protection of groundwater

against pollution caused by dangerous substances) which is due to be repealed under the WFD by the end of 2013.

Article 3 of the 2006 Directive required that the assessment of the chemical status of groundwater use both quality standards identified in Annex I of the Directive and threshold values to be set by individual member states.

Groundwater quality standards are environmental quality standards expressed as the concentration of a particular pollutant, group of pollutants or indicator of pollution in groundwater, which should not be exceeded in order to protect human health and the environment. Annex I of the Directive sets standards for two pollutants: Nitrates - 50mg/l - and; Active substances in pesticides¹⁶, including their relevant metabolites, degradation and reaction products - 0,1 µg/l and 0,5 µg/l (total¹⁷).

Irish groundwater threshold values¹⁸ are currently in the process of being set by the EPA.

4.5.2 SEOs, Indicators and Targets

The following SEOs, Indicators and Targets for Water have been developed with regard to the environmental baseline of the Plan area and the objectives of the above strategic actions.

¹⁶ 'Pesticides' means plant protection products and biocidal products as defined in Article 2 of Directive 91/414/EEC and in Article 2 of Directive 98/8/EC, respectively.

¹⁷ 'Total' means the sum of all individual pesticides detected and quantified in the monitoring procedure, including their relevant metabolites, degradation and reaction products.

¹⁸ Threshold values are to be established by Member States for all pollutants and indicators of pollution which characterise groundwater bodies classified as being at risk of failing to achieve good groundwater chemical status under the WFD. Threshold values are required to be established in a way that, should the monitoring results at a representative monitoring point exceed the thresholds, this will indicate a risk that one or more of the conditions for good groundwater chemical status - with regard to the ability of groundwater to support human uses and with regard to waters used for the abstraction of drinking water - are not being met.

SEO W1:	To maintain and improve, where possible, the quality of rivers and transitional waters
Indicator W1i:	Biotic Quality Rating (Q Value)
Target W1ia:	To maintain a biotic quality rating of Q4, in line with the requirement to achieve good water status under the Water Framework Directive, by 2015
Target W1ib:	To improve biotic quality ratings, where possible, to Q5
Indicator W1ii:	Trophic Status (ATSEBI)
Target W1ii:	To maintain or to improve trophic status, where relevant, to unpolluted in line with the requirement to achieve good water status under the Water Framework Directive, by 2015

SEO W2:	To prevent pollution and contamination of ground water
Indicator W2:	Groundwater Quality Standards and Threshold Values under Directive 2006/118/EC
Target W2:	Compliance with Groundwater Quality Standards and Threshold Values under Directive 2006/118/EC

SEO W3:	To prevent development on lands which pose - or are likely to pose in the future - a significant flood risk
Indicator W3:	Number of developments granted permission on lands which pose - or are likely to pose in the future - a significant flood risk
Target W3:	Minimise developments granted permission on lands which pose - or are likely to pose in the future - a significant flood risk

4.6 Air and Climatic Factors

4.6.1 Air Quality

In order to reduce greenhouse gas emissions the internationally agreed Kyoto Protocol established emissions reduction targets for developing countries. Ireland's emission target for greenhouse gases is to limit the increase in their combined emissions during the five-year period 2008-2012 to 13 per cent above 1990 levels.

4.6.2 SEOs, Indicators and Targets

The following SEO, Indicators and Targets for Air and Climatic Factors have been developed with regard to the environmental baseline of the Plan area and the objectives of the above strategic action.

SEO C1:	To minimise increases in travel related greenhouse emissions to air
Indicator C1i¹⁹:	Percentage of population within the Plan area travelling to work or school by public transport or non-mechanical means
Target C1i:	An increase in the percentage of the population travelling to work or school by public transport or non-mechanical means
Indicator C1ii²⁰:	Average distance travelled to work or school by the population of the LAP area
Target C1ii:	A decrease in the average distance travelled to work or school by the population of the LAP area

¹⁹ As measured by the Central Statistics Office

²⁰ As measured by the Central Statistics Office

4.7 Material Assets

4.7.1 Waste Water

The treatment of wastewater is governed by the Urban Waste Water Treatment Directive (91/271/EEC) (amended by Directive 98/15/EEC) transposed into Irish law by the Urban Waste Water Treatment Regulations 2001 (SI 254 of 2001). The Directive aims to protect the environment from the adverse effects of the wastewater discharges by ensuring that wastewater is appropriately treated before it is discharged to the environment. The Regulations stipulate that sewage treatment facilities are in place in all towns by 2005.

Appropriate treatment of waste water is essential in order to meet the requirements of the Water Framework Directive (see Section 4.5.1).

4.7.2 Traffic

4.7.2.1 Introduction

The occurrence of increased numbers of journeys within, to and from development provided for under the LAP could cause traffic congestion at certain locations. These locations or *hotspots* would be likely to occur along the main road routes - especially at intersections - and would have elevated levels of air pollution and noise levels thereby providing for a harsh sensory environment which may impact upon human health.

It is noted that in addition to being addressed as part of this assessment, traffic issues will also be addressed at the level of individual projects by the development management process and, for certain projects, by EIA.

4.7.3 SEOs, Indicators and Targets

The following SEOs, Indicators and Targets for Material Assets have been developed with regard to the objectives of the above strategic actions.

SEO M1:	To serve new development with appropriate waste water treatment
Indicator M1:	Number of new developments granted permission which cannot be adequately served by a public waste water treatment plant over the lifetime of the LAP
Target M1:	No new developments granted permission which cannot be adequately served by a public waste water treatment plant over the lifetime of the LAP

SEO M2:	To reduce the overall proportion of car dependency within County Wicklow by way of, inter alia, encouraging modal change from car to more sustainable forms of public transport and encouraging development which will not be dependent on private transport
The use of the SEO M2 provides a qualitative directional measure which is used to evaluate the effects of implementing the LAP.	

4.8 Cultural Heritage

4.8.1 Archaeological Heritage

4.8.1.1 Valletta Convention 1992

The European Convention on Protection of the Archaeological Heritage known as the Valletta Convention of 1992. This was ratified by Ireland in 1997 and requires that appropriate consideration be given to archaeological issues at all stages of the planning and development process.

4.8.1.2 National Heritage Plan for Ireland 2002

The core objective of the National Heritage Plan for Ireland 2002²¹ is to protect Ireland's heritage. In this regard the 'polluter pays' principle and the precautionary principle are operable.

²¹ Department of Arts, Heritage, Gaeltacht and the Islands (2002) *National Heritage Plan for Ireland* Dublin: Government of Ireland

4.8.1.3 National Monuments Acts

Archaeology in Ireland is protected under the National Monuments Acts 1930 to 2004.

Recorded monuments are protected by inclusion on the list and marked on the map which comprises the Record of Monuments and Places set out county by county under Section 12 of the National Monuments (Amendment) Act, 1994 by the Archaeological Survey of Ireland. The definition includes Zones of Archaeological Potential in towns and all other monuments of archaeological interest which have so far been identified.

Any works at or in relation to a recorded monument requires two months notice to the Department of the Environment, Heritage and Local Government under section 12 of the National Monuments (Amendment) Act, 1994.

Direct impacts on national monuments in State or Local Authority care or subject to a preservation order require the consent of the Minister for the Environment, Heritage and Local Government under Section 14 of the National Monuments Act 1930 as amended by Section 5 of the National Monuments (Amendment) Act 2004.

4.8.2 Architectural Heritage

4.8.2.1 Planning and Development Act 2000

The Record of Protected Structures (RPS) included in the current County Development Plan is legislated for under Section 51 of the Planning and Development Act 2000 and includes structures which form part of the architectural heritage and which are of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.

4.8.2.2 Architectural Heritage and Historic Monuments Act 1999

The National Inventory of Architectural Heritage (NIAH) is a state initiative under the administration of the DEHLG which was established on a statutory basis under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999. Its purpose is to identify, record, and evaluate the post-1700 architectural heritage of Ireland, uniformly and consistently as an aid in the protection and conservation of the built heritage. It is intended

that the NIAH provides the basis for the inclusion of particular structures in the RPS.

4.8.3 SEOs, Indicators and Targets

The following SEOs, Indicators and Targets for Cultural Heritage have been developed with regard to the environmental baseline of the Plan area and the above strategic actions.

SEO CH1:	To protect archaeological heritage - including entries to the Record of Monuments and Places and unknown archaeology - and the context of the above within the surrounding landscape where relevant
Indicator CH1:	Number of unauthorised developments occurring which result in full or partial loss to archaeological heritage - including entries to the Record of Monuments and Places and unknown archaeology - and the context of the above within the surrounding landscape where relevant
Target CH1:	No unauthorised developments occurring which result in full or partial loss to archaeological heritage - including entries to the Record of Monuments and Places and unknown archaeology - and the context of the above within the surrounding landscape where relevant

SEO CH2:	To preserve and protect the special interest and character of architectural heritage with regard to entries to the Record of Protected Structures and their context within the surrounding landscape where relevant
Indicator CH2i:	Number of unauthorised developments occurring which result in physical loss or loss entries to the Record of Protected Structures and/or their context within the surrounding landscape where relevant
Indicator CH2ii:	Number of additions to the Record of Protected Structures and the number of additional ACAs and comparison with the NIAH
Target CH2i:	No unauthorised developments occurring which result in physical loss or loss entries to the Record of Protected Structures and/or their context within the surrounding landscape where relevant
Target CH2ii:	Make Additions to the Record of Protected Structures and make additional ACAs, where appropriate

4.9 Landscape

4.9.1 European Landscape Convention 2000

Ireland signed and ratified the European Landscape Convention (2000) in 2002 with the Convention entering into force in Ireland in 2004. The aims of the Convention include: to conserve and maintain the significant or characteristic features of a landscape, justified by its heritage value derived from its natural configuration and/or from human activity; to harmonise changes in the landscape which are brought about by social, economic and environmental processes, and to enhance landscapes.

4.9.2 SEOs, Indicators and Targets

The following SEO, Indicator and Target for Landscape have been developed with regard to the environmental baseline of the Plan area and the above strategic action.

SEO L1:	To avoid significant adverse impacts on the landscape, especially with regard to landscapes which are most valuable and most sensitive to change and views and prospects of special amenity
Indicator L1:	Number of complaints received from statutory consultees regarding avoidable impacts resulting from development which is granted permission under the Plan
Target L1:	No developments permitted which result in avoidable impacts on Bray Environs' most sensitive landscapes

Section 5 Context for a Local Area Plan for Bray Environs

5.1 The Local Area Plan

5.1.1 Introduction

The Bray Environs Local Area Plan (LAP) has been prepared in response to the development pressures facing Bray Town and Environs and the need to provide a positive framework for the future development of the area that is consistent with the policies and objectives contained in the Wicklow County Development Plan 2004 - 2010 and other higher forward planning strategic actions.

5.1.2 Legislative Context

Part II, Chapter II, Section 19 of the Planning and Development Act 2000, as amended, provides that a LAP may be prepared in respect of any area which a planning authority considers suitable and, in particular, for areas which require economic, physical and social renewal and for areas likely to be the subject of large scale development within the lifetime of the Plan. The Planning and Development (Amendment) Act 2002, (Section 8) indicates that a LAP may include specific objectives pertaining to the zoning of the land. These objectives must be consistent with the County Development Plan.

The Bray Environs LAP has been prepared in accordance with the requirements of the Planning and Development Act, 2000, as amended. The LAP shall be valid for a period of six years from the date of its adoption by the County Council, unless amended or revoked within that period. It is intended that the long-term vision articulated by the Plan will give a degree of continuity and certainty to the future development of the Plan area.

5.1.3 Structure of the LAP

The LAP consists of a written statement and maps which give a graphic representation of the proposals of the Plan, indicating land use and other development standards together with various local objectives. It is divided into two

Parts, Part A and Part B. Part A is divided into 11 sections as follows:

- Section 1 states the purpose of the LAP;
- Section 2 gives details on the LAP Status and Process;
- Section 3 describes the public consultation process which has been carried out to date;
- Section 4 identifies that development management will be carried out in line with the provisions of the County Development Plan;
- Section 5 provides details on Strategic Environmental Assessment and Appropriate Assessment Screening;
- Section 6 describes the strategic forward planning hierarchy in which the LAP is situated;
- Section 7 provides the rationale for development in Bray Environs; and,
- Section 8 identifies population trends and population projections;
- Section 9 provides details with regard to employment in Bray including employment projections for the area;
- Section 10 details the quantities of residential and employment/industrial zoned land provided for by the LAP;
- Section 11 details how the Plan is determined to be implemented by Wicklow County Council.

Part B is divided into 15 sections as follows:

- Section 1 details the purpose and status of the LAP;
- Section 2 details the planning context in which the LAP is situated;

- Section 3 details the settlement strategy including the rationale for development and the settlement form for development;
- Section 4 provides policies and objectives on residential development;
- Section 5 provides policies and objectives employment and enterprise;
- Section 6 provides policies and objectives on retail;
- Section 7 provides policies and objectives on social and community infrastructure
- Section 8 provides policies and objectives on traffic and transportation
- Section 9 provides policies and objectives on public services infrastructure
- Section 10 provides policies and objectives on built and cultural heritage
- Section 11 provides policies and objectives on landscape and natural and visual amenity;
- Section 12 provides policies and objectives urban design;
- Section 13 provides land use zoning objectives;
- Section 14 provides details on phasing and implementation; and,
- Section 15 summarises the SEA process.

5.1.4 What the LAP will seek to do

The LAP will seek to:

- Provide a coherent and robust framework for the extension of Bray;
- Enhance the economic, social and environmental offer of Bray and its environs;

- Provide the framework to enhance the employment opportunities of the greater Bray area and north Wicklow;
- Provide direction and guidance for the integration of a range of new uses;
- Address the deficiency in open space and recreation provision in the town;
- Strengthen the spatial linkages between Bray and its environs;
- Provide an integrated approach to land use and transportation;
- Provide guidance for the integration of the natural and built environment; and,
- Provide an implementation strategy.

5.1.5 Alternatives

Sections 6 and 7 of this report identify, describe and evaluate different alternatives of how to achieve what the LAP seeks to do as outlined under Section 5.1.4 above, taking into account the relevant land use strategic actions (see Section 5.2 below), the SEOs identified in Section 4 as well as the geographical scope of the LAP.

The evaluation of the alternatives results in the identification of potential impacts and informed the emergence of a preferred alternative for the LAP.

5.2 Interactions with Relevant Planning Policy

5.2.1 Introduction

The LAP is nested in a hierarchy of land use forward planning strategic actions with which it must comply and be consistent.

5.2.2 National Development Plan 2007-2013

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

The need for a National Spatial Strategy was formally recognised by the Government with the publication of the 2000-2006 NDP.

5.2.3 National Spatial Strategy 2000-2020

The National Spatial Strategy 2000-2020 (NSS) is a 20 year planning framework designed to achieve a better balance of social, economic, physical development and population growth between the regions. Its objective is to improve the effectiveness of public investment in infrastructure and other relevant services around the country.

The NSS recognises the pivotal role of the Greater Dublin Area to the overall economic wellbeing of Ireland. The overall approach of the NSS is to seek to accommodate these levels of housing need within existing settlement structures rather than seeking to establish new cities or towns.

Bray is located within the Metropolitan Area of the Greater Dublin Area (see Section 5.2.5). It is a key policy of the NSS to physically consolidate the Dublin Metropolitan Area, supported by effective land use policies and an effective public transport system.

The NSS states that sustainable provision of housing in urban areas involves, among other things:

- Concentration of development in locations where it is possible to integrate employment, community services, retailing and public transport;
- Mixed-use and well-designed higher density development, particularly near town centres and public transport nodes; and,
- The efficient use of land by consolidating existing settlements.

5.2.4 Sustainable Development: A Strategy for Ireland 1997

Sustainable Development: A Strategy for Ireland 1997 provides a framework for the achievement of sustainable development at local level. It

identifies 4 key ways certain land use Plans can contribute to the achievement of sustainability:

- Encourage efficient use of energy, transport and natural resources through careful selection of development locations;
- Promote the most effective use of already developed areas;
- Secure protection and enhancement of the natural environment; and,
- Accommodate new development needs in an environmentally sustainable way.

5.2.5 Regional Planning Guidelines for the Greater Dublin Area 2004-2016

Ireland is divided into eight regional forward planning regions, Dublin, Midlands, Mid East, Mid West, South East, South West, West and Border, each with its own regional planning authority composed of Elected Members selected by the constituent local government councils. Regional planning authorities are required, under the Planning and Development (Regional Planning Guidelines) Regulations 2003 (SI No. 175 of 2003), to draw up regional planning guidelines (RPGs), long term strategic planning frameworks, for their relevant region. RPGs must have regard to the National Spatial Strategy.

The Bray Environs area is located within the Greater Dublin Regional Planning Authority area for which the RPGs for the Greater Dublin Area 2004-2016 have been prepared. The RPGs provide a long term planning framework for the development of the Greater Dublin Area in the twelve year period up to 2016 within the vision of the NSS. The principal objective of the RPGs is to put in place a broad planning framework for the region and to provide an overall long term strategy for the making of Development and Local Area Plans for each local authority in the region.

The settlement strategy of the RPGs divides the Region into two areas: the *Metropolitan Area* and the *Hinterland Area*. The strategy for the *Metropolitan Area* is to consolidate the urban centres, and the provision and facilitation of an integrated public transport system. The strategy

for the *Hinterland Area* focuses on the development of selected large and moderate growth centres to be self-sustaining in terms of employment provision, and housing demands.

Bray is identified as a *Metropolitan Consolidation Town* within the *Metropolitan Area*, and together with Greystones/Delgany forms a *Primary Development Cluster*. Other *Metropolitan Consolidation Towns* include the existing significant urban centres of Swords, Blanchardstown, Lucan, Clondalkin, Tallaght, Dun Laoghaire and Dundrum.

The RPGs provide that Bray should be developed to a relatively large scale as part of the strategy for the consolidation of the *Metropolitan Area*. The Guidelines set out an indicative population range of 40,000 to 100,000 for *Metropolitan Consolidation Towns* and identify their economic function as, inter alia, being a main attractor for major investment and having strong international marketing.

The strategy in the RPGs places fundamental importance on the development of a much-enhanced public transport system. In the *Metropolitan Area*, the intention is to create and sustain conditions suitable for major enhancement of existing public transport. It is therefore, critically important that, in the *Metropolitan Area*, the making of all relevant decisions and policy should give precedence to public transportation, and other sustainable modes, over the requirements of the private car.

The RPGs recommend that additional areas for residential zoning should be selected on the basis of meeting all three of the following criteria:

1. Location within areas identified for development in the strategy;
2. Identified potential to be served by adequate public transport; and,
3. Identified potential for servicing by water supply, drainage, etc.

The RPGs also recommend the consolidation of the urban form of settlements by locating quality employment and residential developments of various sizes in proximity to each other in order to make effective use of suitable lands, reduce the need to travel and reduce the dependence on private car.

5.2.6 Wicklow County Development Plan 2004-2010

Wicklow is one of the most rapidly growing counties in Ireland. This is a result of population retention, growth, in-migration and natural population increase resulting from Wicklow's location within the Greater Dublin Area and the influence of Dublin's Urban Shadow, together with the amenities it offers, including its coastline, mountains and scenic rural areas.

The Wicklow County Development Plan (CDP) 2004-2010 provides a settlement strategy configured in accordance with the NSS and the RPGs, and locates population growth and channels development in line with the strategy advised by RPGs.

It recognised the reality that larger settlements have a critical mass and are thus more successful at providing a wide range of environmental, economic and social facilities, in generating indigenous employment growth and attracting inward investment. The settlement hierarchy placed Bray, the county's only Metropolitan Consolidation Town, a level one town, as the most important settlement in the County. Under the CDP, development in the Bray and its environs area should be focused upon:

- A consolidated approach;
- Increased densities; and,
- Enhancement of the public transport system.

The CDP projects a population for Bray and Environs of 32,012 in 2010 and 35,000 by 2016. The Plan does not expect all towns to reach their indicative populations by 2016. However, it is intended to put the necessary physical infrastructure into place to cater for the future need. The CDP acknowledges the shortfall of available land within the confines of Bray Town Council, and accordingly, the CDP facilitates the expansion of Bray into the environs by zoning lands for development.

5.2.7 North Bray and Environs Land Use and Transportation Study

The preparation of a Land Use and Transportation Study (LUTS) for North Bray and Environs was commissioned jointly by Dun Laoghaire-Rathdown County Council, Wicklow County Council and Bray Town Council in January 2005. The area of the study is defined as a boundary encompassing Woodbrook, Rathmichael, Old Connaught, Fassaroe and North Bray, as well as the N11 as far as the junction with the Bray Southern Cross. The objectives of the commission were to ensure that the study area can cater for expected future levels of development as proposed throughout the Town and County Development Plans, by investigating a range of policies, infrastructural measures, and land use strategies.

The LUTS found that, inter alia, the current zoning of Fassaroe for low density employment is not considered either suitable or sustainable land use management in the context of its location so close to the growth centre of Bray, in view of the consolidation objectives for the Greater Dublin Area and the County policies to promote higher densities and public transport.

The intensification of development in Fassaroe and hence alteration of the current zoning is recommended along with other land use and transportation measures by the study.

The study identifies a proposal for a Rapid Transit Strategy which would incorporate a LUAS extension from Cherrywood to Fassaroe, and a Bus Rapid Transit link from Fassaroe and Old Connaught to Bray Town Centre, including a Park and Ride at Fassaroe.

5.2.8 Bray Town Development Plan 2005-2011

The strategic policy objectives of the Bray Town Development Plan include aspirations to:

- Promote Bray as a regional centre of economic, social, cultural and ecological growth;
- Consolidate the urban form of the town;

- Improve the economic competitiveness of Bray; and,
- Retain the town's population through providing a sufficient amount of affordable residential units in the town and facilitating the development of infrastructure, services, employment and social opportunities to meet the needs of the population.

A number of weaknesses hamper the town's development at the present, including:

- an insufficient supply of houses to match demand;
- a lack of available land within the town which hampers the potential for large-scale development of employment-generating opportunities within the town;
- an insufficient quantum and quality of retail floorspace;
- a lack of employment opportunities;
- an increase in traffic congestion which come about as a result of increased car use, a lack of routes across the Dargle River and a shortfall of car parking facilities; and,
- Pressures on existing social and physical infrastructure as a result of population growth

It is clear from the weaknesses identified by the Bray Town Development Plan that the town will be unable to achieve its strategic policy objectives as set out. Accordingly, to enable Bray Town to fulfil its role as a Metropolitan Consolidation Town it is necessary that the potential of the environs be addressed.

5.2.9 DEHLG Residential Guidelines

The DEHLG's Residential Density Guidelines 1999 and the DEHLG's Sustainable Residential Development in Urban Areas Draft Guidelines 2008 recommend planning authorities to promote higher residential densities, particularly in redeveloping 'brownfield' sites and in proximity to town centres and public transport corridors.

5.3 Environmental Protection Objectives

The LAP is subject to a number of high level national, international and regional environmental protection policies and objectives, including those which have been identified as Strategic Environmental Objectives in Section 4.

Examples of Environmental Protection Objectives include the aim of the EU Habitats Directive - which is to contribute towards ensuring bio-diversity through the conservation of natural habitats and of wild fauna and flora in the European territory of Member States - and the purpose of the Water Framework Directive - which is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater.

The LAP must be consistent with these objectives and implement them at local level in Bray Environs.

Section 6 Description of Alternative Plan Scenarios

6.1 Introduction

One of the critical roles of the SEA is to facilitate an evaluation of the likely environmental consequences of a range of alternative strategies for accommodating future development in Bray Environs.

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

This section identifies and describes different plan scenarios, taking into account higher level strategic actions as well as the geographical scope of the area.

These scenarios are evaluated for their environmental consequences in Section 7. The policies and objectives which are required to realise the alternative which was chosen for the Plan are evaluated in 0.

Mitigation measures which attempt to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the Plan and which were recommended for integration into the Plan are provided in Section 9.

6.2 Identification and Description of Alternative Scenarios

6.2.1 Introduction

The following describe the range of potential scenarios for the types of planning strategies that could be adopted for Bray Environs. These are neither predictions nor preferences - instead they offer a range of plausible and internally consistent narratives of the outcome of different planning and development strategies. These provide the basis for the comparative evaluation of the likely environmental effects of each plan, which in turn serves the purpose of identifying which features of plans and policies are likely to

be sensitive or robust over the widest range of circumstances.

6.2.2 Need for a Local Area Plan

Firstly it has been examined whether there is, or will be in the future, a need for an LAP for the Bray Environs area.

Due to higher level strategic forward planning actions, Bray is envisaged to potentially develop to a relatively large scale; the Town is designated by the Regional Planning Guidelines for the Greater Dublin Area as a Metropolitan Consolidation Town, a designation that is reflected in the Settlement Strategy for the County Development Plan (see Section 5.2).

The relatively low rate of recent growth in Bray Town together with the focusing of growth mainly in the Environs and within the functional area of Wicklow County Council indicates the extent to which development is restricted within the town. There is a lack of available land within the town which has contributed to a situation, which has been identified by the Bray Town Development Plan (see Section 5.2.8), whereby: the supply of houses does not meet demand; large-scale development of employment-generating opportunities within the town is limited; there is an insufficient quantum and quality of retail floorspace; there is a lack of employment opportunities; there are pressures on existing social and physical infrastructure as a result of population growth; and, there has been an increase in traffic congestion which has come about as a result of increased car use, a lack of routes across the Dargle River and a shortfall of car parking facilities.

Consequently, Bray Town is unable to provide for the proper planning and sustainable development of its area in line with the objectives of higher level forward planning strategic actions including the Regional Planning Guidelines and the County Development Plan. Also, the Town cannot adequately satisfy both the economic and social needs of its population within the existing boundary, leading to the lack of scope to adequately address economic employment issues and the provision of adequate housing for its population, which clearly has serious implications for the vision,

role and function of Bray Town as outlined in the current Town Development Plan.

The Environs area, therefore, has an integral part to play in the continued growth and development of Bray as a Metropolitan Consolidation Town. Accordingly, the majority of the future growth of the Town has to be accommodated in the Environs area. Proper planning and sustainable development of this growth will only be achieved through a land use plan that provides a framework for the proper planning and sustainable development of the Environs of Bray commensurate with its designation as a Metropolitan Consolidation Town. With regard to the Planning and Development Act 2000 (as amended) the most appropriate land use plan for this purpose has been deemed to be a Local Area Plan (LAP)²².

Accommodating growth through a Plan will help to prevent urban sprawl, ribbon development and the coalescence of settlements because outside of the designated LAP boundaries limited development only will be permitted. It would help ensure that the coalescence of the settlements of Bray, Greystones, Kilmacanogue and Enniskerry does not occur.

The need for a Local Area Plan was established.

6.2.3 Method for providing for development through a LAP

As established above, a Local Area Plan that provides a framework for the proper planning and sustainable development of the Environs of Bray commensurate with its designation as a Metropolitan Consolidation Town by, inter alia, allocating of sufficient amounts of land for various landuses is necessary.

Different ways or methods of providing for this need were explored. Alternative methods for facilitating various landuses include brownfield development and greenfield development.

As the Bray Environs area is generally made up generally of greenfield lands and the amount of development which could be provided for by

brownfield development is severely limited, greenfield development was determined to be the chief method by which the need is to be provided for.

Greenfield development was determined to be the method by which the need for the LAP is to be provided for.

6.2.4 Alternative Locations which could be subject to an LAP

Once the method of meeting the need was determined, and prior to the scoping of the SEA, environmental constraints were identified and a number of alternatives relating locations where development could be provided for by the Plan were explored.

These alternatives were identified within and close to an Indicative Study Area which was identified by Wicklow County Council. The north and north-western boundaries of the Study Area were defined by the County boundary and the green belt zoning in the Enniskerry Local Area Plan 2002-2008. The remainder of the northern area was defined by Bray Town Council administrative boundary. The eastern, southern and western boundaries were all defined by existing roads, with the exception of the portion around Kilmacanogue Village, which was defined on the basis of village boundary.

Four alternative locations were identified across the Study Area. These alternatives are evaluated for their likely environmental and planning effects in Section 7 and are as follows:

1. Lands at Kilmacanogue East, to the south of Bray located off the N11 National Primary Road (see Number 1 on Figure 6.1);
2. Lands to the South of Bray including those at Kilruddery (see Number 2 on Figure 6.1);
3. Lands to the north and south of the River Dargle, between Dargle Glen and the Cookstown River - to the west of Bray and the N11 road (see Numbers 3 and 4 on Figure 6.1);; and,

²² As a need has been established for the preparation of a Local Area Plan, the *'do-nothing scenario'* has been excluded from the selection of the alternatives as it is not a realistic option.

4. Lands at Fassaroe, located to the west of Bray and the N11 road (see Number 5 on Figure 6.1).

Lands at Fassaroe and Kilruddery were determined to be the locations at which development is to be provided for by the LAP.

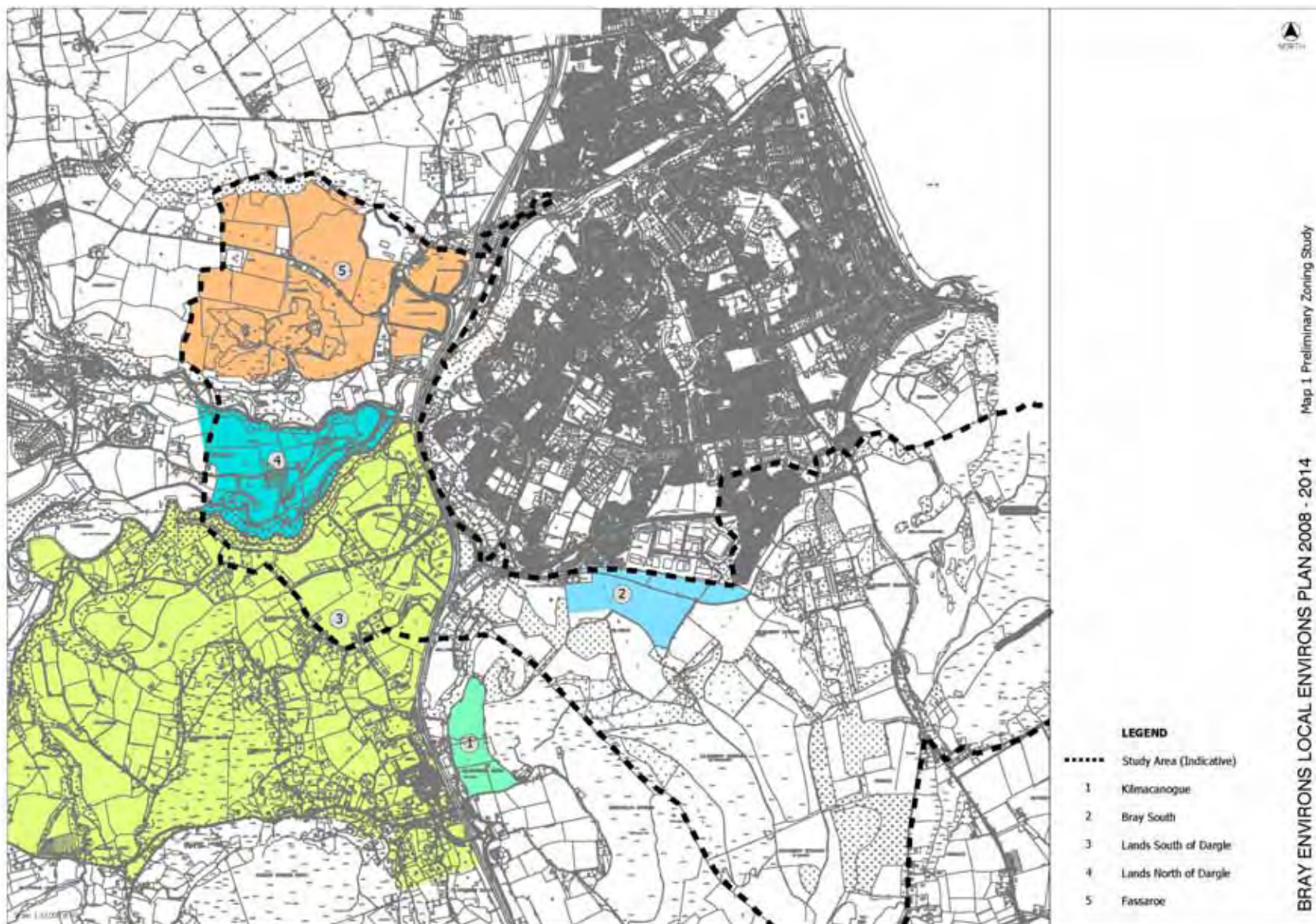


Figure 6.1 Alternative Locations for providing for the Local Area Plan

6.2.5 Alternatives at Fassaroe

6.2.5.1 Introduction

Subsequent to the identification of the favoured alternative locations at Fassaroe and Kilruddy for development, alternatives were developed for these areas. The alternatives for Fassaroe are provided below.

6.2.5.2 Alternatives at Fassaroe

Fassaroe is the primary development centre within the Plan area. The vision for Fassaroe contained in the LAP is *of an area that is integrated, compact, efficient and sustainable with the necessary community, social, employment, retail and recreational facilities providing good linkage within the area and with Bray Town and the wider GDA.*

For Fassaroe, environmental considerations determine the extent and shape of the boundary:

- The Ballyman Glen candidate Special Area of Conservation [cSAC] provides a constraint in the north of the Fassaroe area and a buffer of a relatively non-development accommodating zoning [OS Open Space] was applied to the cSAC;
- The Cookstown River and its northern banks provided a constraint in the south of the Fassaroe area and a relatively non-development accommodating zoning [GB Green Belt] was applied to the northern banks of the River; and,
- The N11 National Primary Road and the M11 Motorway provide a physical eastern boundary to the Fassaroe boundary.

With regard to the area which was determined by the above constraints three alternatives were developed for Fassaroe. The alternatives are mapped on the following pages as Figure 6.2 Fassaroe Land Use Alternative A, Figure 6.3 Fassaroe Land Use Alternative B, Figure 6.4 Fassaroe Land Use Alternative C.

The differences in these alternatives are shown on Table 6.1, Table 6.2 and Table 6.3. Alternatives B and C provide for a population of 10,000 in 3,900 units while Alternative A provides for the least amount of residents, 7,200 residents in 2,800 units.

Alternative B provides for 21,900 employees, Alternative C provides for 16,100 employees and Alternative A provides for 17,100 employees. Employment is provided for by each alternative in a variety of employment/land uses.

The three alternatives have a number of items which are common to all, namely:

- The road network;
- The LUAS alignment;
- Various Community Uses:
 - 2 no. primary schools
 - 1 no. secondary school
 - Crèche facilities
 - Community Centre
 - Public House
 - Post Office
 - Doctor's Surgery
 - District Shopping Centre (10,000 sq.m. gross)
 - Fire Station;
- The location of the main open spaces; and,
- The District Park which is for a total area of approximately 22 hectares.

The zoning categories and related information identified on Table 6.4 are also consistent within the three alternatives.

	Scenario A	Scenario B	Scenario C
Residential Units	2,800	3,900	3,900
Residents	7,200	10,000	10,000

Table 6.1 Residential Units & Residents provided for by each Land Use Scenario for Fassaroe

	Scenario A	Scenario B	Scenario C
High Density Employment	8,000	16,300	9,300
Office (in Mixed Use Zones)	5,500	4,600	4,600
Retail	500	500	500
Industry/Business Park	2,900	500	1,700
Warehousing	200	-	-
Total Employees	17,100	21,900	16,100

Table 6.2 Employees provided for by each Land Use Scenario for Fassaroe

	Scenario A	Scenario B	Scenario C
Residents/Employees Split	29.6%/70.4%	29.4%/70.6%	38.1%/61.9%

Table 6.3 Residents/Employees Split for each Land Use Scenario for Fassaroe

Code	Zoning Category	Detail
R1-R3	Combined Residential Uses	Household size: 2.4-2.7, average 2.55. 10% of site area for pocket parks, buffer zones to countryside etc.
R1	Existing Residential	-
R2	New Residential - High Density	70-100 units/hectare - average 85 units/hectare (net)
R3	New Residential - Medium to Low Density	30-70 units/hectare - average 50 units/hectare (net)
MU1	Mixed Use 1	10,000 sq.m. gross District Shopping Centre (45% site area) Office (20% site area) Residential (15% site area) Community and other (10 % site area) Park and Ride (10 % site area)
MU2	Mixed Use 2	Residential (60% site area) Office (30% site area) Other (10 % site area)
E1	Employment 1 - High Density Employment	To provide for employment uses such as office, high tech activities, telemarketing, IT activities, Research and Development [Maximum Plot Ratio 1.5; Employment Density 25]
E2	Employment 2 - Industry / Business Park	To provide for appropriate industrial and related uses, including the development of business, office, science/technology park [Maximum Plot Ratio 0.5; Employment Density 50]
E3	Employment 3 - Warehousing	To provide for appropriate warehouse, wholesale or light industry [Maximum Plot Ratio 0.3; Employment Density 80]
RWH	Retail Warehousing	[Maximum Plot Ratio - not applicable; Employment Ratio 20]
PU	Public Utility	ESB, Fire Station etc.
OS	Open Space	-
GB	Greenbelt	-
cSAC	candidate Special Area of Conservation	-

Table 6.4 Zoning Categories and Common Detail for each Land Use Scenario for Fassaroe

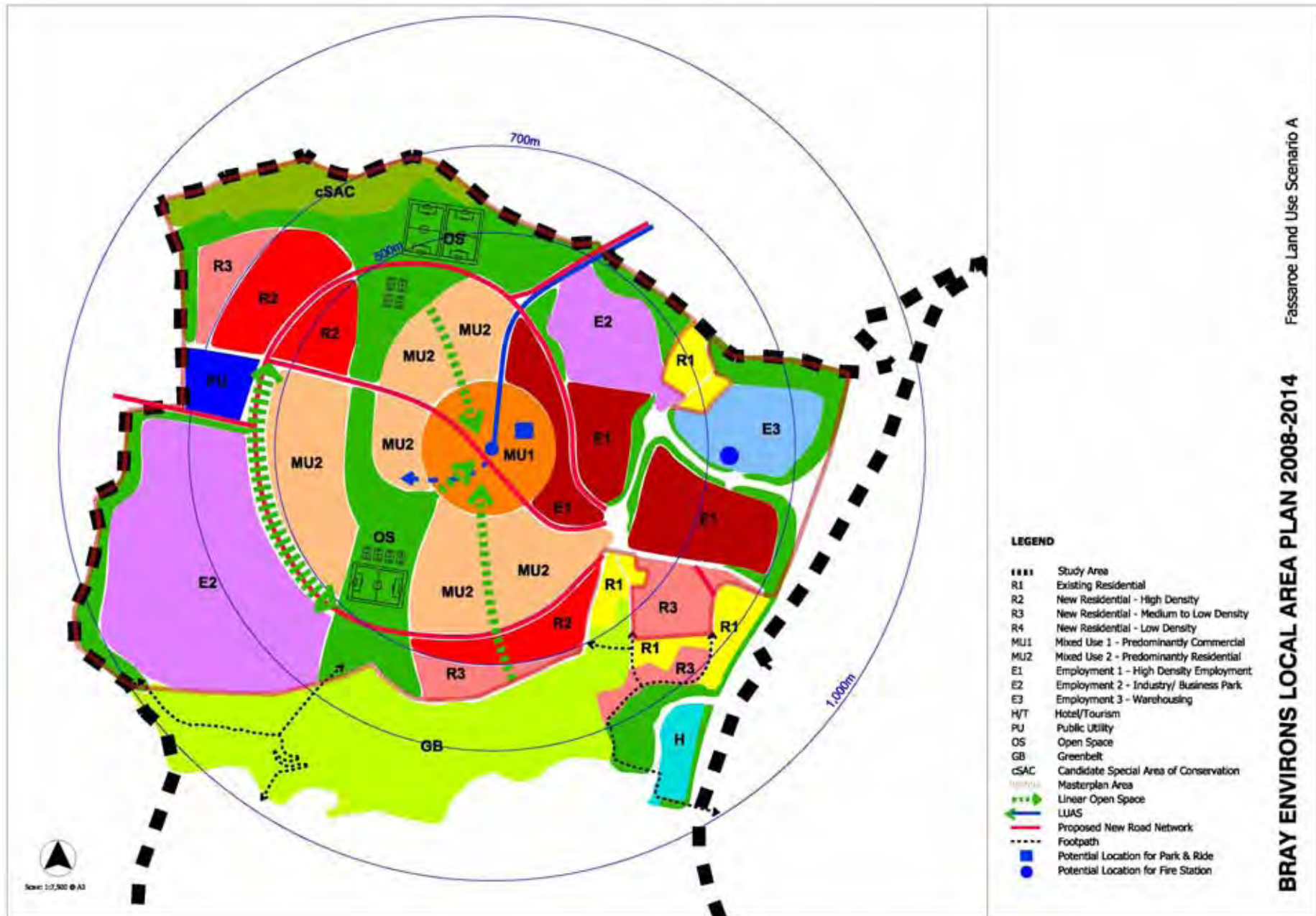


Figure 6.2 Fassaroe Land Use Alternative A

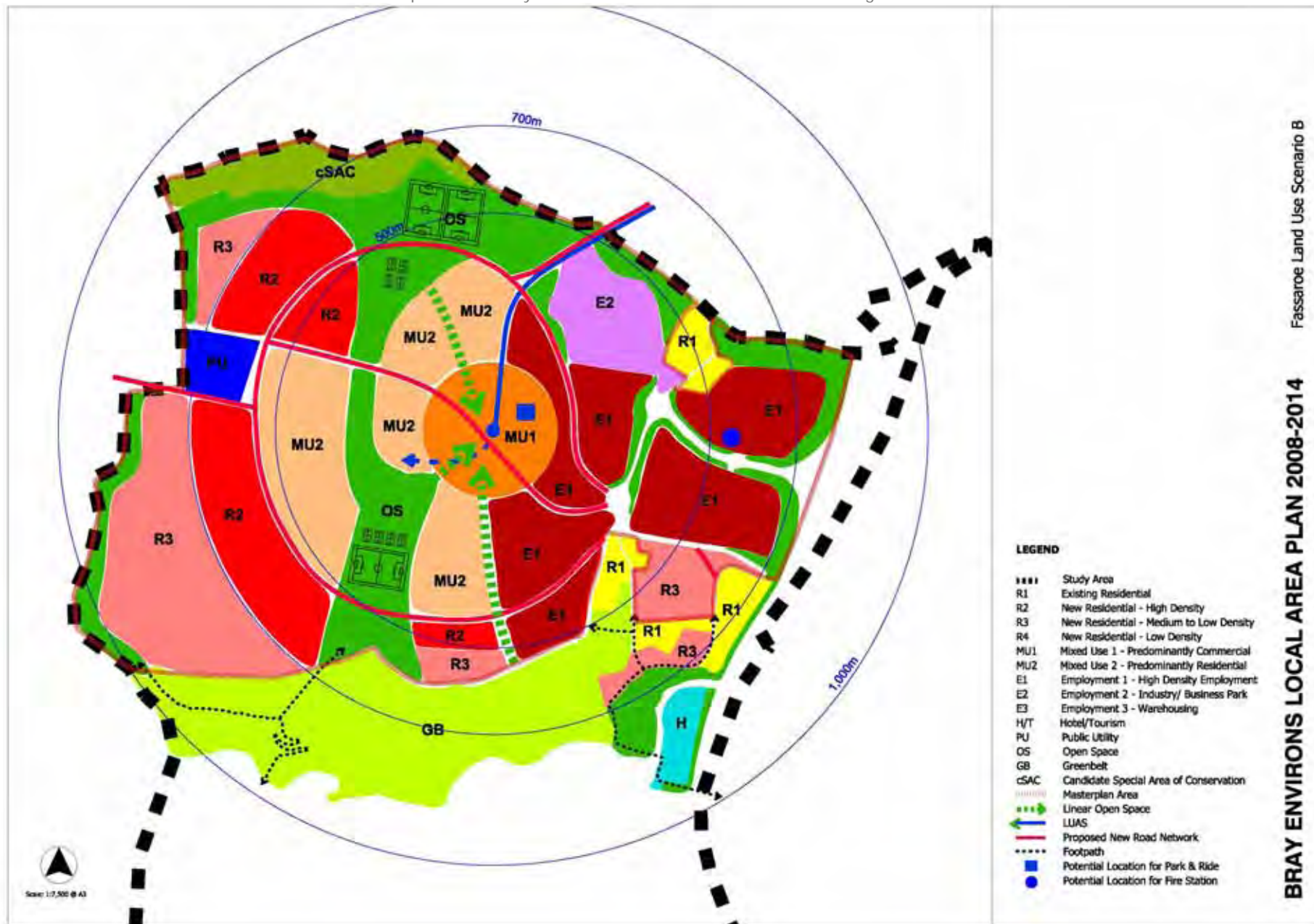
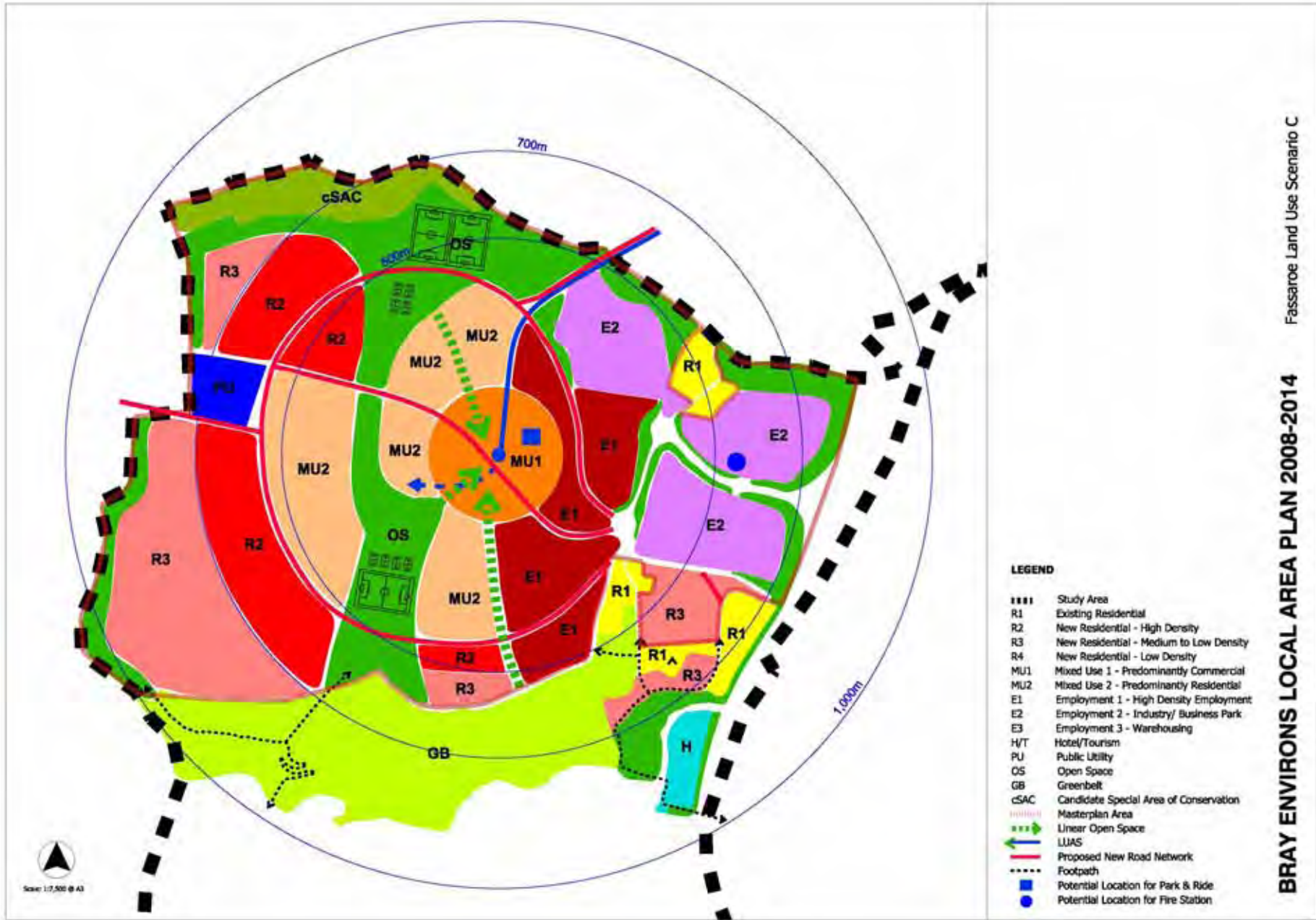


Figure 6.3 Fassaroe Land Use Alternative B



BRAY ENVIRONS LOCAL AREA PLAN 2008-2014 Fassaroe Land Use Scenario C

Figure 6.4 Fassaroe Land Use Alternative C

6.2.6 Alternatives at Kilruddery

6.2.6.1 Introduction

Subsequent to the identification of the favoured alternative locations at Fassaroe and Kilruddery for development, alternatives were developed for these areas. The alternatives for Kilruddery are provided below.

The vision for Kilruddery and its Demesne contained in the LAP is *to allow for a limited extent of development, in a considered and sensitive way that maintains the character, integrity and protected status of the House and its Demesne.*

Four alternatives were identified for the Kilruddery area of the LAP, taking into account various extents of land and varying extents of land uses. The alternatives have been prepared with regard to the Pre-Draft Consultation Submissions which were made earlier in the Plan-preparation process.

The land use zoning objectives used for the alternatives are as follows:

- T - Tourism
- E2 - Employment 2 - Industry/Business Park
- OS - Open Space
- R4 - New Residential - Low Density
- MU2 - Mixed Use 2 - Predominately Residential

It is assumed that lands within the Kilruddery Plan area which are not attributed land use zoning objectives under the LAP will retain their existing use(s).

6.2.6.2 Alternative 1

Alternative 1 (see Figure 6.5) consists of:

- E2 (Employment 2 - Industry/Business Park) zoning at Foggy Field which is located to the south west of the roundabout between the R761 and the R768;
- T (Tourism) zoning to the west of Kilruddery House;
- E2 (Employment 2 - Industry/Business Park) zoning to the south of the existing industrial area that adjoins the Southern Cross Road;

- OS (Open Space Zoning) which links the Tourism zoning to the west of Kilruddery House to the wooded area at Giltspur; and,
- R4 (New Residential - Low Density) zoning on the upwardly sloping land around Giltspur.

6.2.6.3 Alternative 2

Alternative 2 (see Figure 6.6) is the same as Alternative 1 minus the E2 (Employment 2 - Industry/Business Park) zoning to the south of the existing industrial area that adjoins the Southern Cross Road.

It consists of:

- T (Tourism) zoning to the west of Kilruddery House;
- E2 (Employment 2 - Industry/Business Park) zoning to the south of the existing industrial area that adjoins the Southern Cross Road;
- OS (Open Space Zoning) which links the Tourism zoning to the west of Kilruddery House to the wooded area at Giltspur; and,
- R4 (New Residential - Low Density) zoning on the upwardly sloping land around Giltspur.

6.2.6.4 Alternative 3

Alternative 3 (see Figure 6.7) is the same as Alternative 1 minus the R4 (New Residential - Low Density) zoning on the upwardly sloping land around Giltspur.

It consists of:

- E2 (Employment 2 - Industry/Business Park) zoning at Foggy Field which is located to the south west of the roundabout between the R761 and the R768;
- T (Tourism) zoning to the west of Kilruddery House;
- E2 (Employment 2 - Industry/Business Park) zoning to the south of the existing industrial area that adjoins the Southern Cross Road; and,
- OS (Open Space Zoning) which links the Tourism zoning to the west of Kilruddery House to the wooded area at Giltspur.

6.2.6.5 Alternative 4

Alternative 4 (see Figure 6.8) consists of:

- E2 (Employment 2 - Industry/Business Park) zoning at Foggy Field which is located to the south west of the roundabout between the R761 and the R768;
- T (Tourism) zoning covering Kilruddery House and Gardens - the extent of this zoning is greater than in any of the other alternatives;
- E2 (Employment 2 - Industry/Business Park) zoning to the south of the existing industrial area that adjoins the Southern Cross Route;
- R4 (New Residential - Low Density) zoning on the upwardly sloping land around Giltspur - the extent of this zoning is greater than in any of the other alternatives; and,
- T (Tourism) zoning at Belmont to the south of Kilruddery.

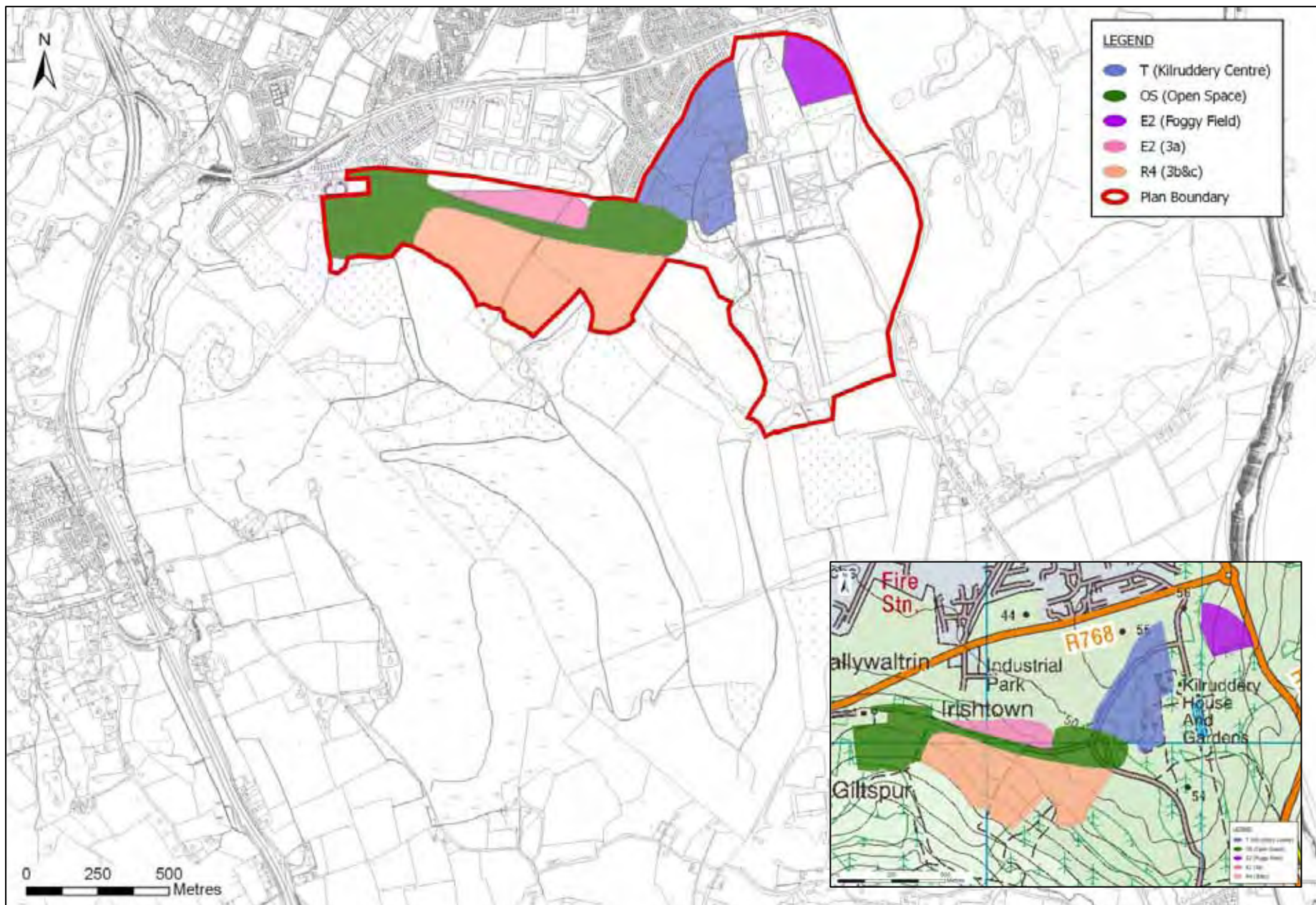


Figure 6.5 Kilruddery Land Use Alternative 1

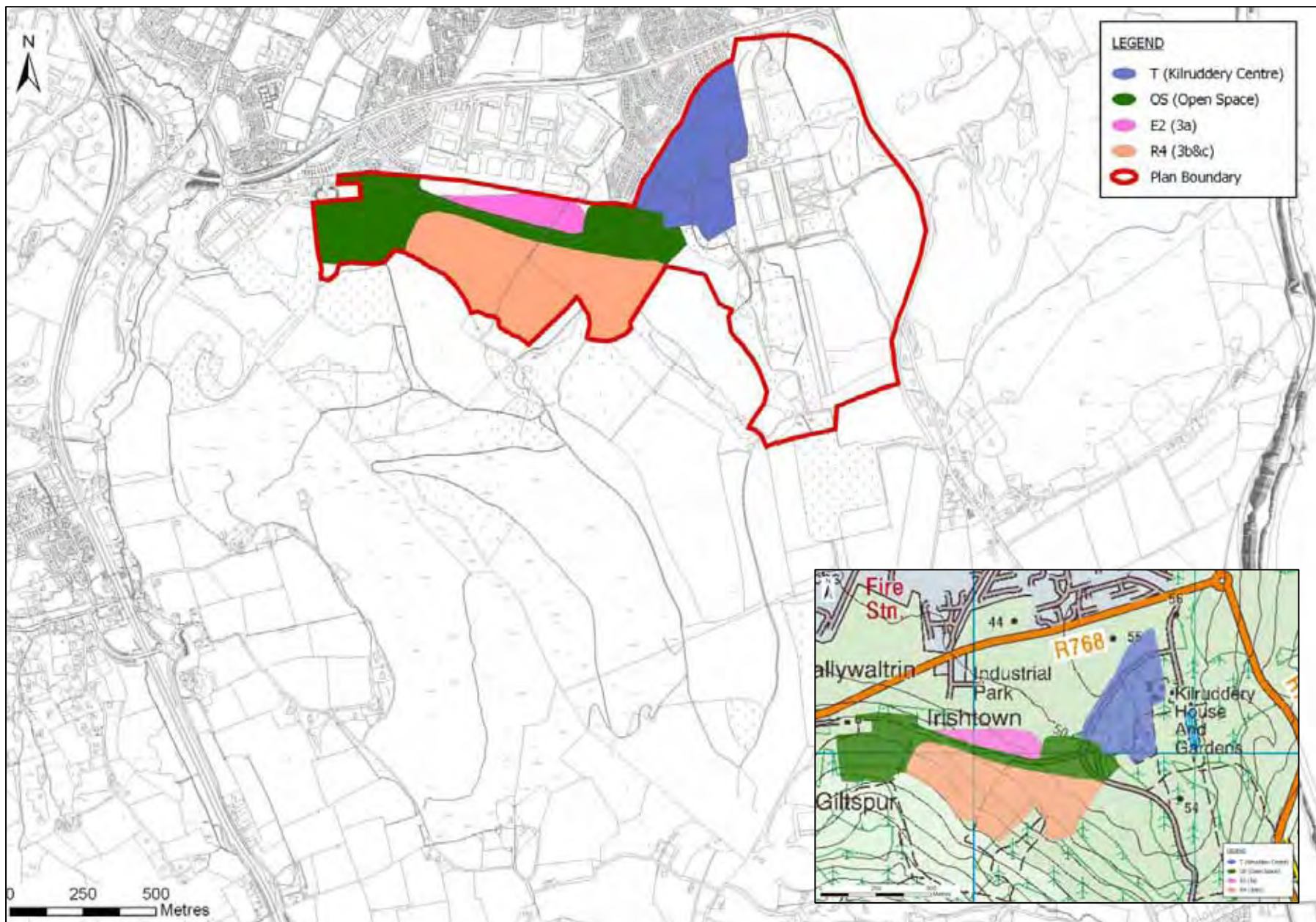


Figure 6.6 Kilruddery Land Use Alternative 2

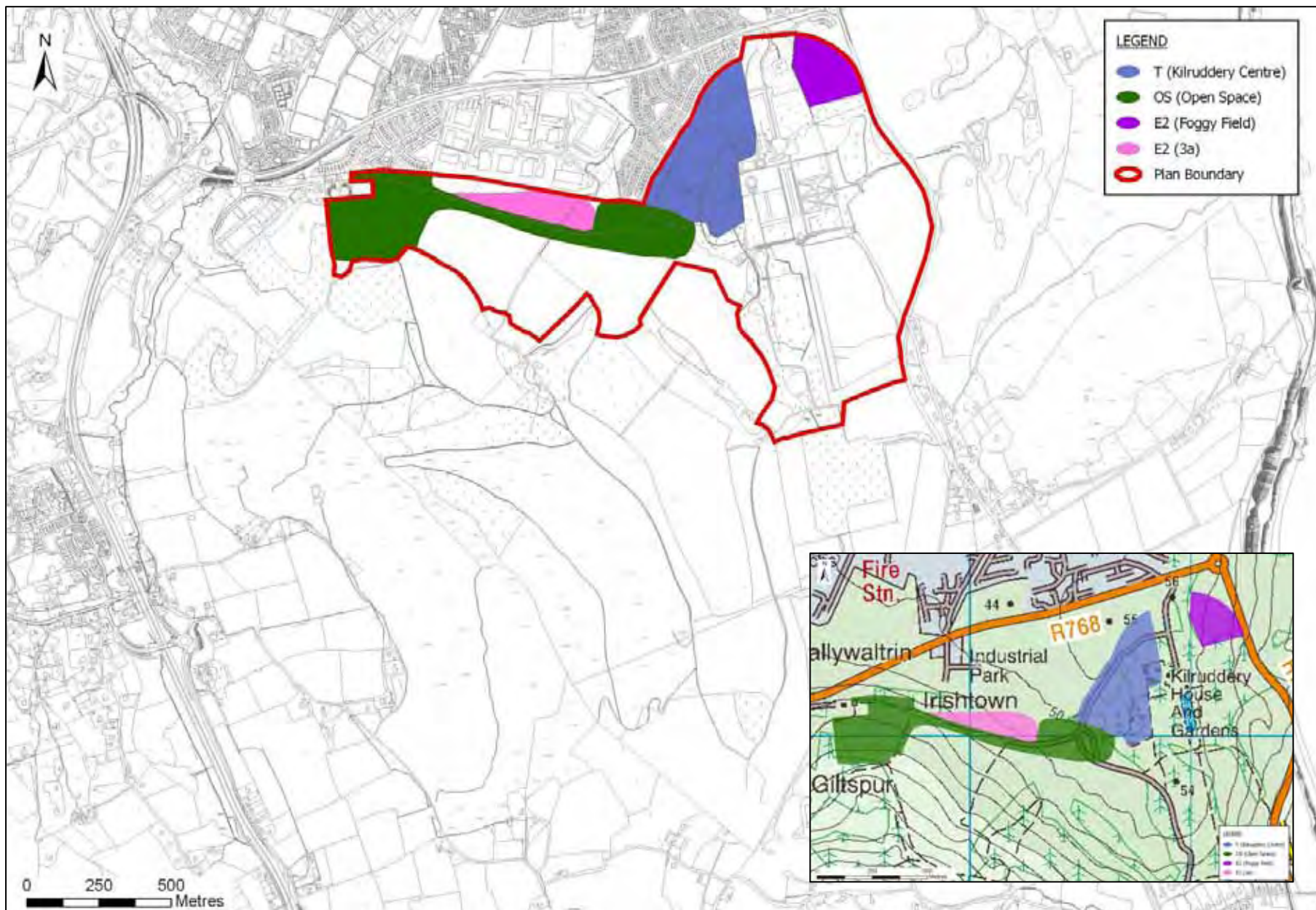


Figure 6.7 Kilruddery Land Use Alternative 3

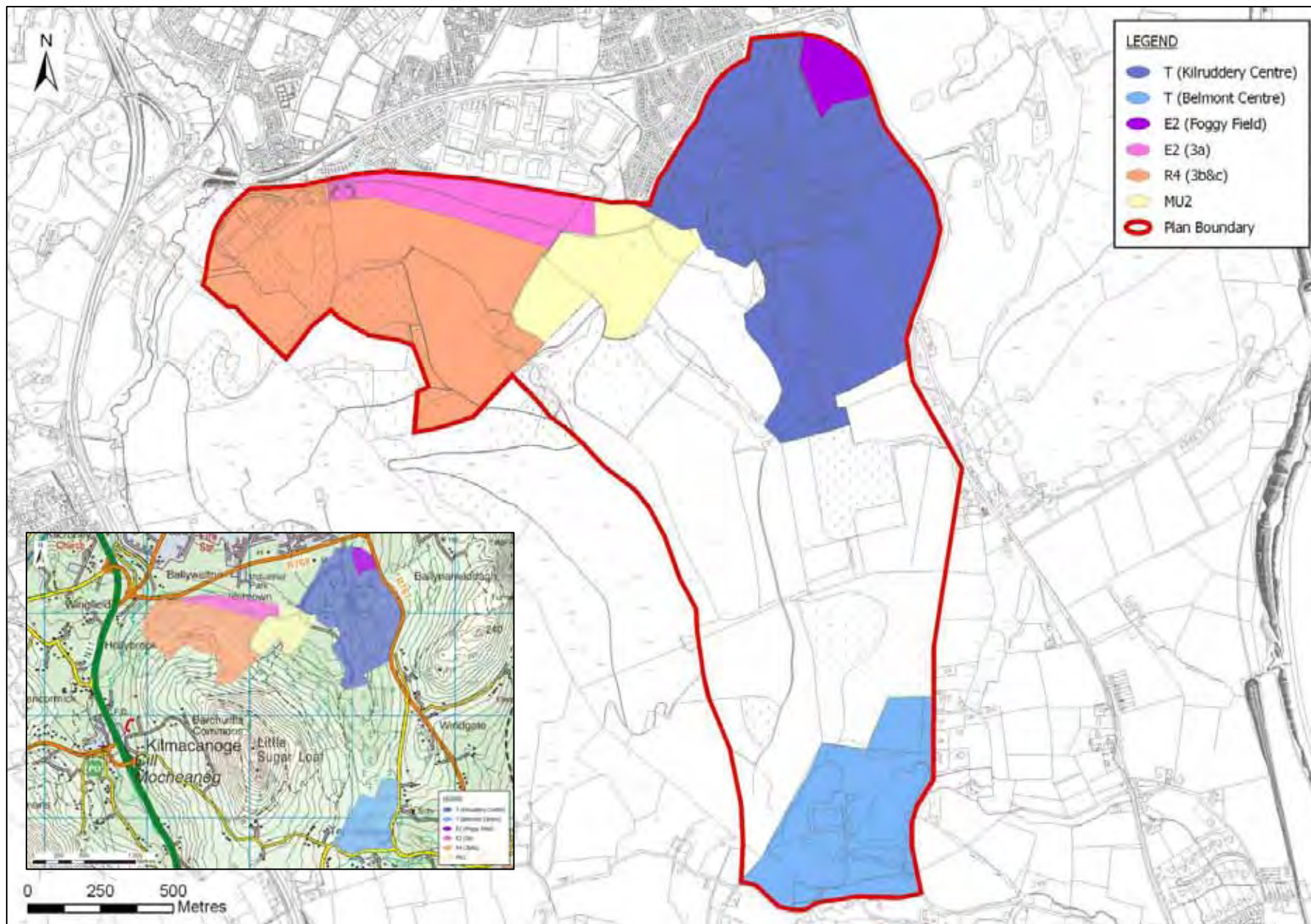


Figure 6.8 Kilruddery Land Use Alternative 4

Section 7 Evaluation of Alternatives

7.1 Introduction

The objective of this section is to determine the relative merits of a range of the alternative scenarios for the future development of Bray Environs. This determination sought to understand whether each alternative was likely to improve, conflict with or have a neutral interaction with the area's environment.

The environmental effects of implementing each of the alternative scenarios are evaluated in a succinct and focused way against both the existing environment and the Strategic Environmental Objectives (SEOs).

In order to comply with the SEA Directive Strategic Environmental Objectives have been grouped under relevant parent components such as *water* and *landscape*.

7.2 Methodology

7.2.1 Evaluation

7.2.2 Existing Environment

In order to identify the extent to which environmental sensitivities could be impacted upon by implementation of the alternative scenarios, use has been made of the description of the environmental baseline, including the maps which spatially represent components of the environmental baseline, provided within Section 3.

7.2.3 Strategic Environmental Objectives (SEOs)

Based on an understanding of the existing and emerging environmental conditions in the Plan area a series of SEOs were developed in order to assess the likely environmental effects which would be caused by implementation of each of the four alternative scenarios described in Section 6. The alternatives are evaluated using compatibility criteria (see Table 7.1) in order to determine how they are likely to affect the status of these SEOs.

The interactions between the SEOs and the policies and objectives of the alternatives determine the effects of implementing the alternatives. These effects include secondary, cumulative, synergistic, short, medium and long-term permanent and temporary, positive and negative effects.

Table 7.2 brings together all the SEOs which have been developed from international, national and regional policies which generally govern environmental protection objectives.

The SEOs and the alternative scenarios are arrayed against each other to identify which interactions - if any - would cause impacts on specific components of the environment.

Where the appraisal identifies a likely conflict with the status of an SEO the relevant SEO code is entered into the conflict column - e.g. B1 which stands for SEO likely to be affected - in this instance 'to avoid loss of relevant habitats, geological features, species or their sustaining resources in designated ecological sites'.

Likely to Improve status of SEOs	Probable Conflict with status of SEOs- unlikely to be mitigated	Potential Conflict with status of SEOs- likely to be mitigated	Uncertain interaction with status of SEOs	Neutral Interaction with status of SEOs	No Likely interaction with status of SEOs
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Table 7.1 Criteria for appraising the effect of Plan provisions on Strategic Environmental Objectives

SEO Code	SEO
B1	To avoid loss of relevant habitats, geological features, species or their sustaining resources in designated ecological sites
B2	To avoid significant adverse impacts, including direct, cumulative and indirect impacts, to relevant habitats, geological features, species or their sustaining resources in designated ecological sites by development within or adjacent to these sites
B3	To sustain, enhance or - where relevant - prevent the loss of ecological networks or parts thereof which provide significant connectivity between areas of local biodiversity
HH1	To protect human health from hazards or nuisances arising from exposure to incompatible landuses
S1	Maximise the sustainable re-use of brownfield lands, and maximise the use of the existing built environment rather than developing greenfield lands
W1	To maintain and improve, where possible, the quality of rivers and transitional waters
W2	To prevent pollution and contamination of ground water
W3	To prevent development on lands which pose - or are likely to pose in the future - a significant flood risk
C1	To minimise increases in travel related greenhouse emissions to air
M1	To serve new development with appropriate waste water treatment
M2	To reduce the overall proportion of car dependency within County Wicklow by way of, inter alia, encouraging modal change from car to more sustainable forms of public transport and encouraging development which will not be dependent on private transport
CH1	To protect archaeological heritage - including entries to the Record of Monuments and Places and unknown archaeology - and the context of the above within the surrounding landscape where relevant
CH2	To preserve and protect the special interest and character of architectural heritage with regard to entries to the Record of Protected Structures and their context within the surrounding landscape where relevant
L1	To avoid significant adverse impacts on the landscape, especially with regard to landscapes which are most valuable and most sensitive to change and views and prospects of special amenity

Table 7.2 Strategic Environmental Objectives (SEOs)²³

²³ Strategic Environmental Objectives (SEOs) are methodological measures which are developed from international, national, regional and county policies which generally govern environmental protection objectives and against which the environmental effects of the Plan can be tested. The SEOs are used as standards against which the development strategies, policies and objectives of the Plan can be evaluated in order to help identify areas in which significant adverse impacts are likely to occur, if unmitigated against.

7.3 Evaluation of Alternative Locations which could be subject to an LAP

N.B. See footnote²⁴ about the use of footnotes in this section.

7.3.1 Similarities between Alternatives

All alternatives provide for greenfield development²⁵ as it is not possible for brownfield development to cater for the population required to be provided for by the Plan. Greenfield development would be likely to present a number of conflicts with environmental components.

Impacts upon ecological connectivity²⁶ could be mitigated by offsetting any losses in ecological corridors.

All alternatives would be required to be accompanied by mitigation measures to avoid significantly increasing the risk of flooding²⁷.

Waste water from the Bray area currently undergoes primary treatment before being pumped into the sea through a long sea outfall. Waste water arising from the Bray area will undergo secondary treatment at Shanganagh beginning from 2011-2012. Should new development be permitted before this upgrade is operational with sufficient capacity then it is likely that waste water would not be treated in compliance with the Urban Waste Water Treatment Directive (Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment) (amended by Directive 98/15/EEC)²⁸. Increased volumes of primary treated waste water discharges into the sea which would arise from increases in population would be likely to reduce the ability of the coastal water body off the coast of Bray to meet the *high status* objective of the Water Framework Directive. Such increases in the

volume of discharges could also impact upon the ability of bathing water at Bray to comply with EU Mandatory Values (Acceptable Quality) which could affect human health²⁹.

The groundwater bodies underlying each of the Alternatives are classified as being either *at significant risk* of meeting the objectives of the Water Framework Directive or *probably at significant risk* of meeting the objectives of the Water Framework Directive. Diffuse sources of pollution are attributed to this classification. Groundwater beneath each of the Alternatives is listed on the Water Framework Directive Register of Protected Areas for Drinking Water (Ground Water). Changes in the characteristics of run-off and groundwater recharge associated with the replacement of semi natural surfaces with artificial surfaces could - if unmitigated - impact upon the ability of Wicklow County Council to achieve its requirements under the Water Framework Directive³⁰.

7.3.2 Alternative 1 - Lands at Kilmacanogue East

There are no designated ecological sites³¹ within the vicinity of Kilmacanogue east.

The lands at Kilmacanogue East are located within an Area of Outstanding Natural Beauty³². Development of these lands would be likely to significantly adversely impact upon Prospect of Special Amenity Number 11 - *Prospect of Great Sugarloaf across Kilmacanogue marsh and quill road* - and View of Special Amenity Number 8 - *View of Little Sugar Loaf* - both of which are protected under the current Wicklow County Development Plan.

The potential lands for development are distant from the existing village of Kilmacanogue, aggravated by the severing impact of the N11, with no access to efficient public transport infrastructure presenting a further locational disadvantage. It is uncertain as to whether development of these lands would be accompanied by public transport therefore it is uncertain whether this alternative would enable greenhouse gas emissions and car dependency to be minimised³³.

²⁴ Footnotes like this are used in this section in order to identify instances where interactions between the relevant Scenario and the relevant SEOs occur. The nature of these interactions are identified on Table 7.5.

²⁵ SEO S1

²⁶ SEO B3

²⁷ SEO W3

²⁸ SEO M1

²⁹ SEO HH1

³⁰ SEO W2

³¹ SEO B1 and B2

³² SEO L1

³³ SEOs C1 and M2

Any development of lands at Kilmacanogue East would have to take cognisance of the presence of an entry to the Record of Monuments and Places which is identified as being a Fulacht Fia³⁴.

7.3.3 Alternative 2 - Lands to the South of Bray (including those at Kilruddery)

There are no designated ecological sites³⁵ within the vicinity of the South of Bray.

Parts of these lands are located in an Area of Outstanding Natural Beauty and adjacent to an area that is under consideration for Special Amenity Area Order to the south. Certain parts of the lands are particularly sensitive due to the topography, which slopes upwards to the Little Sugar Loaf to the south, and their visibility from the Southern Cross Road³⁶.

The Kilruddery lands have no access to public transport infrastructure and it is uncertain as to whether development of these lands would be accompanied by public transport therefore it is uncertain whether this alternative would enable greenhouse gas emissions and car dependency to be minimised³⁷.

There are 6 entries to the Record of Monuments and Places³⁸ (RMP) within these lands. In order to prevent unnecessary impacts on archaeological heritage any development on these lands would have to carry out pre-development archaeological testing surveying, monitoring and recording.

By providing for development in the vicinity of the Protected Structure of Kilruddery House potential conflicts could arise between new development and the protection of this structure, including its curtilage³⁹.

7.3.4 Alternative 3 - Lands to the North and South of the River Dargle

The Dargle River Valley proposed Natural Heritage Area is located on these lands. In addition, the River Dargle is listed on the Water Framework Directive's Register of Protected Areas for *Habitats Rivers* and is a salmonid river which is protected under the European Communities (Quality of Salmonid Waters) Regulations 1998 (SI No. 293 of 1988). The River Dargle is also classified as being *at significant risk* of meeting the objectives of the Water Framework Directive. Any development on these lands would have to strictly comply with mitigation measures including appropriate land use zoning and other mitigation measures in order to avoid, reduce and/or offset impacts upon ecology⁴⁰ and water quality⁴¹.

The eastern part of these lands are classified under the Wicklow County Development Plan 2004-2010 County Landscape Characterisation as being within a *Corridor Area* while the western lands are classified as being within an *Area of Outstanding Natural Beauty*. The *Area of Outstanding Natural Beauty* classification indicates that the western lands are of a high sensitivity and value on a County level. Development on these lands could have a potentially conflicting interaction with the protection of sensitive landscapes and with the protection of Prospects of Special Amenity Value which are protected under the Wicklow County Development Plan⁴².

The interaction between this Alternative and the reduction of greenhouse gas emissions⁴³ and the minimisation of car dependency⁴⁴ is uncertain. It would be important that a sufficient public transport service accompanies development on this Alternative site.

In order to prevent unnecessary impacts on entries to the Record of Monuments and Places⁴⁵ (RMP) - which include a Church, a Graveyard and a possible enclosure - and unknown archaeological heritage, appropriate

³⁴ SEO CH2

³⁵ SEO B1 and B2

³⁶ SEO L1

³⁷ SEOs C1 and M2

³⁸ SEO CH1

³⁹ SEO CH2

⁴⁰ SEO B1 and B2

⁴¹ SEO W1

⁴² SEO L1

⁴³ SEO C1

⁴⁴ SEO M2

⁴⁵ SEO CH1

mitigation measures would be required to accompany this alternative.

7.3.5 Alternative 4 - *Lands at Fassaroe*

The Ballyman Glen candidate Special Area of Conservation and proposed Natural Heritage Area is located on these lands. Impacts upon this designated ecological site⁴⁶ could however be avoided, reduced and/or offset through appropriate land use zoning and other mitigation measures.

Development at Fassaroe could have a potential conflicting interaction with the protection of human health⁴⁷ due to the presence of lands which were used as landfills in the past and which have not been fully defined or remediated.

By providing for significant increases in the residential and employment populations this alternative would be likely to enable the development of the proposed high quality Luas public transport link - this would help to reduce dependency on private transport⁴⁸ as well as minimising future transport related greenhouse gas emissions⁴⁹.

Due to the presence of Fassaroe Castle (RMP Ref. WI 007-027) it is likely that there is subterranean archaeological heritage beneath the subject lands which has not been identified to date - mitigation measures would be required to avoid and reduce adverse impacts⁵⁰.

While Fassaroe is located within an Area of Outstanding Natural Beauty, the validity of this designation in the area has been eroded in the past by the existing sand and gravel pit as well as more recent development close to the N11. Lands which rise up to the south in the centre of the Fassaroe lands are, however, visually sensitive⁵¹.

⁴⁶ SEO B1 and B2

⁴⁷ SEO HH1

⁴⁸ SEO M2

⁴⁹ SEO C1

⁵⁰ CH1

⁵¹ SEO L1

7.3.6 Evaluation against SEO's

	Likely to Improve status of SEOs	Probable Conflict with status of SEOs - unlikely to be mitigated	Potential Conflict with status of SEOs - would be mitigated	Uncertain interaction with status of SEOs	Neutral Interaction with status of SEOs	No Likely interaction with status of SEOs
Alternative 1 <i>Lands at Kilmacanogue East</i>		L1	B3 HH1 S1 W2 W3 M1 CH1	C1 M2		B1 B2 W1 CH2
Alternative 2 <i>Lands to the South of Bray (including those at Kilruddery)</i>			B3 S1 CH1 CH2 W2 M1 HH1 W3	C1 M2 L1		B1 B2 W1
Alternative 3 <i>Lands to the North and South of the River Dargle</i>			B1 B2 B3 HH1 S1 W1 W2 W3 M1 CH1 CH2 L1	C1 M2		
Alternative 4 <i>Lands at Fassaroe</i>	C1 M2		B1 B2 B3 HH1 S1 W1 W2 W3 M1 CH1 CH2 L1			

Table 7.3 Evaluation of Alternative Locations which could be subject to an LAP against SEOs

7.3.7 Determination of Alternative Locations for the Local Area Plan

The area which would be developed under Alternative 1 - *Lands at Kilmacanogue East* - is located to the east and outside of Kilmacanogue which is designated a Small Growth Town II settlement under higher level land use strategic actions. In accordance with the Wicklow County Development Plan, residential development here is required to be predominantly restricted to local need. Impacts upon protected Prospects and Views as a result of implementation of this alternative would be unavoidable.

With regard to Alternative 2 - *Lands to the South of Bray (including those at Kilruddery)* - only a limited extent of low density development would be considered viable on lands within the Kilruddery Demesne. Such development would have to be at a sufficient distance from the Estate House - in order to avoid impacts on the curtilage of the House - and in close proximity to existing employment and residential development. If accompanied by mitigation measures, tourism uses associated with the heritage of the Kilruddery Estate on Demesne lands located to the edge of the Demesne could also be viable.

The land south of the Dargle Glen and between the Dargle and Cookstown River included in Alternative 3 - *Lands to the North and South of the River Dargle* - is not recommended for future development owing to the sensitivity of the landscape, inappropriate access to the N11 across the Dargle Bridge, inadequate access along small country lanes, and the lack of quality public transport infrastructure. The majority of the lands to the north of the Dargle Glen are not identified for substantial development owing to the sensitivity and high amenity of the landscape indicated by environmental designations, the rural character and remoteness from the built-up area and the lack of existing or proposed efficient public transport.

With regard to Alternative 4, lands at Fassaroe have been zoned for development purposes in both the 1999 and 2004 County Development Plans, in recognition that the lands are suitable to accommodate the necessary expansion of Bray Town. These lands are located within the Metropolitan Area as designated by the RPGs. Moreover, the direct access to the N11 and the M11 motorway, the planned extension of the LUAS to Bray and Fassaroe, and its locational advantage within the Greater Dublin Area, afford the area a strategic advantage by ensuring the sustainability of a greater residential and working population.

7.3.8 Conclusion

In conclusion, both Alternative 4 - Lands at Fassaroe - and part of Alternative 2 - Lands to the South of Bray (specifically lands at Kilruddery) were selected, having regard to a broader consideration of available areas around the perimeter of Bray that was carried by Tíros Resources Ltd.

The selected locations were identified as the optimum balance between likely environmental effects, the potential to restore former landfill sites and the potential to connect with high-capacity public transportation routes.

Lands at Fassaroe and Kilruddery were determined to be the locations at which development is to be provided for by the LAP.

7.4 Evaluation of Alternatives for Fassaroe

7.4.1 Evaluation against Existing Environment

N.B. See footnote²⁴ (on page 94) about the use of footnotes in this section.

- **Brownfield vs. Greenfield Development**

Inherent to the implementation of all three alternatives is the method by which they provide for development - which is by way of greenfield development⁵². Brownfield development in Bray Town would not cater for the population required to be provided for by the Plan. Greenfield development of Fassaroe would be likely to present a number of conflicts with environmental components which are identified throughout this section.

Each of the alternatives provide for a similar amount of greenfield land to be developed.

- **Biodiversity and Flora and Fauna**

Although there is a potential conflict between the implementation of a Plan for Fassaroe and the protection of the Ballyman Glen cSAC and pNHA ecologically designated site⁵³, the application of buffers to development by Alternatives A, B and C together with the integration of measures detailed under Section 9 of this report would mitigate this conflict.

Implementation of Alternatives A, B and C would significantly and adversely affect non-designated biodiversity and flora and fauna by providing for the development of greenfield lands which would result in the replacement of semi natural habitats with artificial surfaces. Adverse effects upon ecological connectivity⁵⁴ would be likely as a result

of such greenfield development however each of the alternatives would mitigate against these effects by integrating greenbelt zoning and a number of linear open spaces and parks into the Plan. Also measures in Section 9 of this report would offset negative impacts to ecological connectivity.

- **Human Health, Old Landfills and Flooding**

Implementation of a Plan for Fassaroe would be likely could have a potential conflicting interaction with the protection of human health and could significantly and adversely affect human health⁵⁵. Such potential conflicts could - in the absence of mitigation - arise from: increasing the risk of flooding⁵⁶ on lands within, upstream and/or downstream of Fassaroe; development of - or development adjacent to - lands which were used as landfills in the past and which have not been fully defined or remediated; and/or, from development which is located alongside the M11 Motorway. Such conflicts and adverse effects would be likely to be mitigated by the land use zoning of each Alternative - which allow for significant buffers around each surface water body - and the measures detailed in Section 9 of this report which include requirements for: the integration of Sustainable Urban Drainage Systems; the adoption of a sequential approach to flood risk management; the preparation of flood risk assessments; and, measures relating to old landfills.

- **Groundwater and Surface Water**

The groundwater body underlying the Fassaroe area is rated as being highly vulnerable to pollution by the Geological Survey of Ireland and the Cookstown River is classified by the Water Framework Directive Characterisation Report as being *at significant risk* of not meeting the objectives of the Water Framework Directive by 2015. The Cookstown River has been listed on the Water Framework Directive Register of Protected Areas for Drinking Water

⁵² SEO S1

⁵³ SEOs B1 and B2

⁵⁴ SEO B3

⁵⁵ SEO HH1

⁵⁶ SEO W3

while groundwater beneath the Plan area is listed on the Water Framework Directive Register of Protected Areas for Drinking Water (Ground Water).

Implementation of Alternatives A, B and C could conflict with the status of ground⁵⁷ and surface⁵⁸ waters and associated flora and fauna - if unmitigated - by providing for the development of greenfield lands. Changes in the characteristics of run-off and groundwater recharge associated with the replacement of semi natural surfaces with artificial surfaces could impact upon water quality as could the construction of buildings and associated infrastructure. Such impacts could affect the ability of Wicklow County Council to achieve its requirements under the Water Framework Directive.

- **Waste Water Infrastructure, Bathing Water and Human Health**

Waste water from the Bray area currently undergoes primary treatment before being pumped into the sea through a long sea outfall. Waste water arising from the Bray area will undergo secondary treatment at Shanganagh beginning from 2011-2012.

Should new development be permitted before this upgrade is operational with sufficient capacity then it is likely that waste water would not be treated in compliance with the Urban Waste Water Treatment Directive (Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment) (amended by Directive 98/15/EEC)⁵⁹. Increased volumes of primary treated waste water discharges into the sea which would arise from increases in population would be likely to reduce the ability of the coastal water body off the coast of Bray to meet the *high status* objective of the Water Framework Directive. Such increases in the volume of discharges could also impact upon the ability of bathing water at Bray to comply with EU Mandatory Values

(Acceptable Quality) which could affect human health⁶⁰.

Alternatives A and C would require waste water treatment for a similar number of employees, 17,100 and 16,100 respectively while Alternative B would require waste water treatment for a significantly larger 21,900 persons. Alternatives B and C would both require waste water treatment for 10,000 persons while Alternative A would require waste water treatment for 7,200 persons. Taking these figures into account Alternative B would be likely to need most waste water treatment capacity, followed by Alternative C with Alternative A likely to need the least amount of waste water treatment capacity.

- **Greenhouse Gas Emissions and Car Dependency**

Alternatives A, B and C would, by providing for significant increases in the residential and employment populations of Fassaroe close to the proposed high quality public transport link of the Luas and by accompanying new development with other improvements in public transport infrastructure and services before developments take place, would help to reduce the likely dependency on private transport⁶¹ which would otherwise occur as a result of alternative, uncoordinated greenfield development in the wider northern County Wicklow area. The new population provided by the alternatives would contribute to a critical mass which would make the provision of Luas public transport link and other public transport services more economically viable than would be the case if population increased in ad-hoc areas across the wider northern Wicklow area.

As a result - and providing that development is preceded by public transport infrastructure and services - the extent of both future car generated traffic and future transport related greenhouse gas emissions⁶² which

⁵⁷ SEO W2

⁵⁸ SEO W1

⁵⁹ SEO M1

⁶⁰ SEO HH1

⁶¹ SEO M2

⁶² SEO C1

would be caused by accommodating this population in the wider northern County Wicklow area would be significantly reduced.

It is likely that implementation of each Alternative would have effects upon traffic levels, air quality and noise levels within and emanating from the Plan area however it is noted that adherence to measures integrated into the LAP and measures for the construction and management of projects arising out of development management and EIA processes would mitigate such effects.

Having regard to the population of residents and employees which would result from each of the scenarios (see previous information under *Waste Water Infrastructure, Bathing Water and Human Health*), Alternative B would be likely to generate most traffic, followed by Alternative C with Alternative A likely to generate the least amount of traffic.

- **Architectural and Archaeological Heritage**

There are 5 entries to the Record of Monuments and Places⁶³ (RMP) within the Fassaroe lands. Due to the presence of Fassaroe Castle (RMP Ref. WI 007-027) it is likely that there is subterranean archaeological heritage beneath the subject lands which has not been identified to date. In order to prevent unnecessary impacts on archaeological heritage it will be necessary to list and map the extent of all monuments in the area and carry out pre-development archaeological testing surveying, monitoring and recording.

By providing for development in the vicinity of Protected Structures and other structures of architectural interest within the Fassaroe lands, potential conflicts could arise between new development and the protection of these structures, including their curtilage (the parcel of ground immediately associated with the structure or in use for the purposes of the structure)⁶⁴.

- **Landscape**

The area including Fassaroe is classified under the Wicklow County Development Plan 2004-2010 County Landscape Characterisation as being within an *Area of Outstanding Natural Beauty*. This classification indicates that the lands are of a high sensitivity and value on a County level however it is noted that the validity of the designation in the Fassaroe area has largely been eroded in the past by the existing sand and gravel pit as well as more recent development close to the N11. Notwithstanding this, implementation of Alternatives A, B or C would be likely to significantly change the landscape which is found at Fassaroe by replacing greenfield areas with development thereby eroding further the *Area of Outstanding Natural Beauty* designation⁶⁵.

Lands in Fassaroe which rise up to the south towards the central MU2 (Mixed Use 2 - Predominantly Residential) zones are visually sensitive⁶⁶. This has been addressed by the designation of open space for much of the area visible from below. Development on these lands zoned for mixed use will be likely to be visible from below, however, one of the measures recommended by Section 9 of this report would mitigate against effects arising from this; *development proposals shall be accompanied by a visual impact assessment demonstrating that landscape impacts have been anticipated and avoided to a level consistent with the sensitivity of the landscape.*

⁶³ SEO CH1

⁶⁴ SEO CH2

⁶⁵ SEO L1

⁶⁶ SEO L1

7.4.2 Summary Evaluation against SEO's

	Likely to Improve status of SEOs	Probable Conflict with status of SEOs - unlikely to be mitigated	Potential Conflict with status of SEOs - would be mitigated	Uncertain interaction with status of SEOs	Neutral Interaction with status of SEOs	No Likely interaction with status of SEOs
Alternative A	C1 M2		B1 B2 B3 HH1 S1 W1 W2 W3 M1 CH1 CH2 L1			
Alternative B	C1 M2		B1 B2 B3 HH1 S1 W1 W2 W3 M1 CH1 CH2 L1			
Alternative C	C1 M2		B1 B2 B3 HH1 S1 W1 W2 W3 M1 CH1 CH2 L1			

Table 7.4 Evaluation of Alternatives for Fassaroe against SEOs

7.4.3 Summary

The implementation of each of the land use alternatives for the part of the LAP which is concerned with Fassaroe would be likely to have similar environmental effects. There would be potential conflicts and associated potential adverse effects with most of the environmental components.

The adverse effects would be likely to be avoided or reduced by complying with various aspects of the land use zoning objectives of the LAP and mitigation measures including those which are recommended to be integrated into the Plan (provided in Section 9 of this report).

7.4.4 The Fassaroe Component of the LAP

The Fassaroe component of the LAP that emerged from the Plan preparation process has a close correlation to Alternative A. The evaluation presented for Alternative A over Sections 7.4.1 to 7.4.3 is generally applicable for the Fassaroe component of the LAP and it is accompanied by an evaluation of the provisions of the LAP in Section 8.

The Alternatives that were examined were produced and evaluated at an earlier - more embryonic - stage to facilitate evaluation and selection of a plan. Consequently there are a

number of differences between Alternative A and the Fassaroe component of the LAP. These differences are indicated on

Figure 7.1 and Figure 7.2. The differences are identified and discussed below.

Difference 1

The residential area to the south of the mixed use area which surrounds the core is of a lower density in the LAP. This difference does not change the assessment provided above for Alternative A.

Difference 2

The proposed residential area in the north west of the Fassaroe area is of a higher density in the LAP than it is in Alternative A. This difference does not change the assessment provided above for Alternative A.

Difference 3

The LAP provides for an additional area of *New Residential Development* in comparison with Alternative A. This difference would be likely to have significant adverse effects on non-designated biodiversity and flora and fauna and ecological connectivity which could be mitigated however residual effects would remain as a result of the greenfield development.

Difference 4

There is an additional area of zoning provided for an area of land to the east of the M11 motorway. The LAP provides for *New Residential* and *Existing Commercial* zoning objectives in this area.

The area contains a number of buildings as well as areas of grass and tree cover. There are no ecologically designations sites within this area. The Dargle forms the eastern boundary of this area and the western boundary is confined by the County Brook Stream (information on the status of the Dargle is provided in previous sections however there is no Water Framework Directive information available for the County Brook Stream).

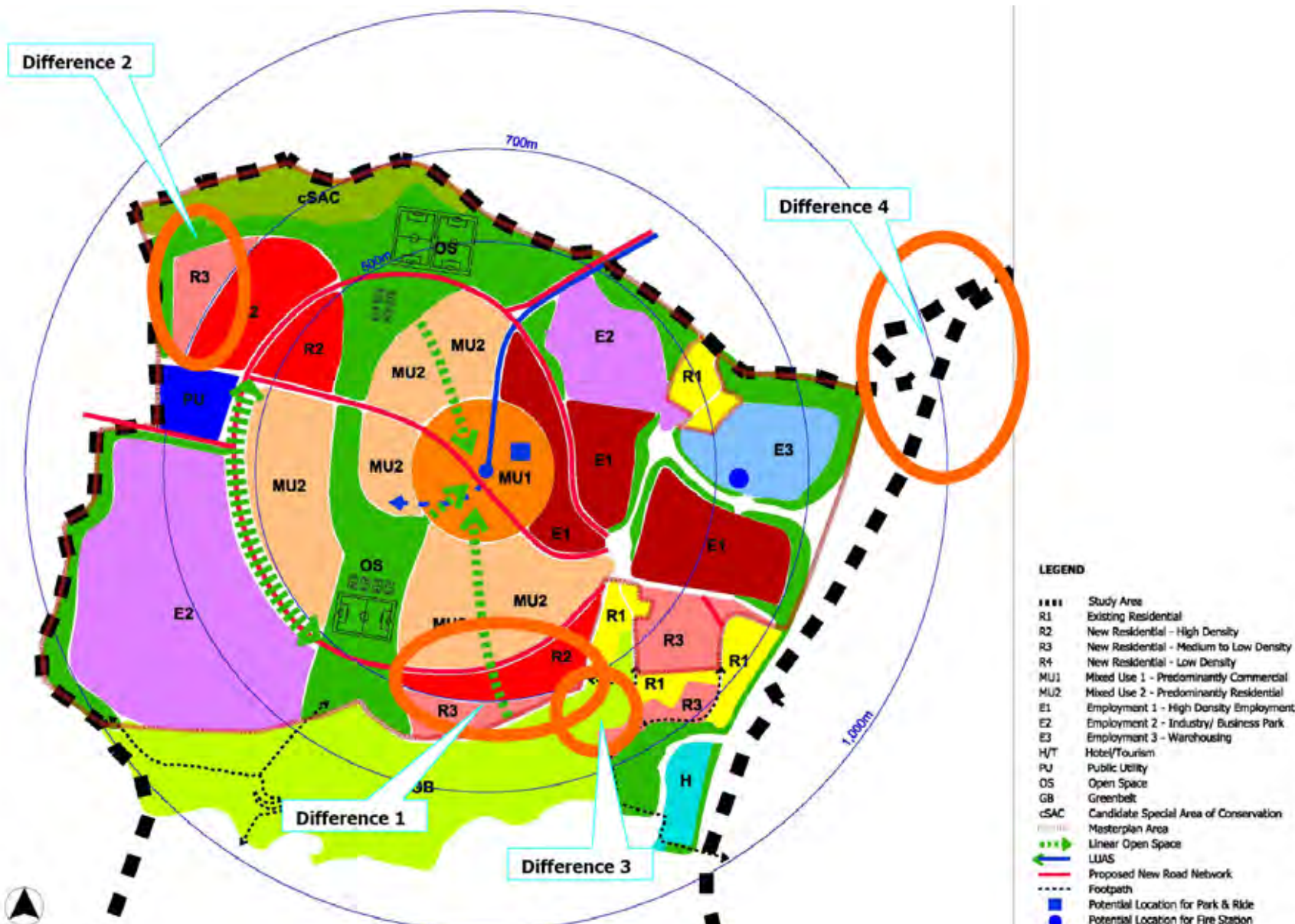
According to Wicklow County Council's Landscape Characterisation (2004), this section lies within an Area of Outstanding Natural Beauty. To the east of the area there is one monument listed on the Record of Monuments and Places.

This area has been identified in the Bray Flood Emergency Plan (2008) as lying within an *Outline Area likely to be affected by flood* though properties in the area are not classed as being of high or medium risk.

Although the lands are already developed, the potential provision of new or replacement development of these lands would be likely to conflict with minimising increases in flood risk, if unmitigated. Measures which have been integrated into the Plan would be likely to mitigate effects arising from this conflict.

Difference 5

The Fassaroe component of the LAP will provide for a residential population of approximately 6,659 persons, compared with the population of 7,200 persons provided for by Alternative Scenario A. Consequently the extent of loadings upon infrastructure and services as a result of implementing the LAP would be likely to be less than those resulting from implementation of Alternative A. This difference however does not change the assessment provided above for Alternative A.



Fassaroe Land Use Scenario A

RAY ENVIRONS LOCAL AREA PLAN 2008-2014

Figure 7.1 Fassaroe Land Use Alternative A
(Differences between this Alternative and the LAP are identified)

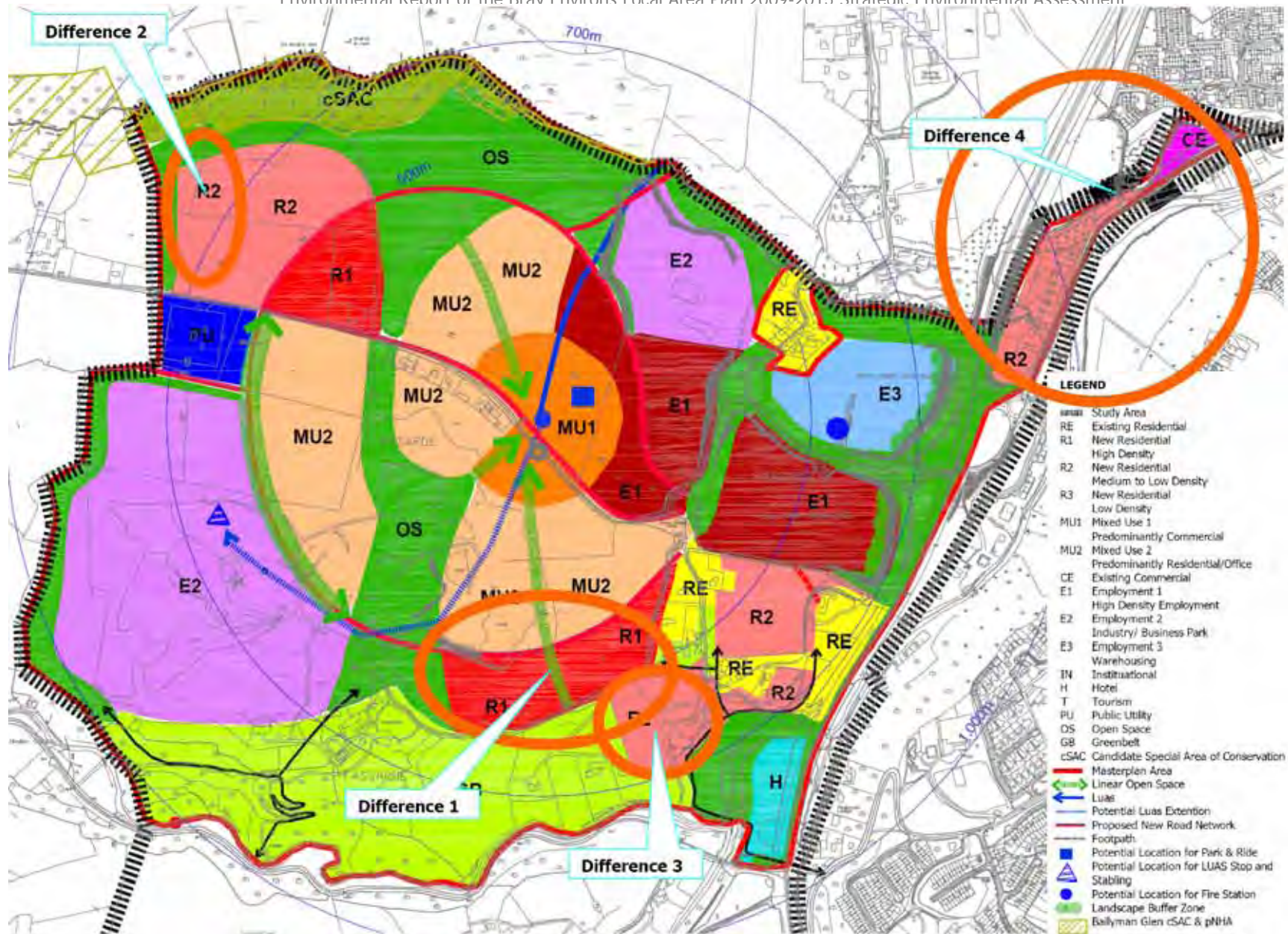


Figure 7.2 Fassaroe Land Use Zoning Map from the LAP (differences between the LAP and Alternative A are identified)

7.5 Evaluation of Alternatives for Kilruddery

7.5.1 Evaluation against Existing Environment

N.B. See footnote²⁴ (on page 94) about the use of footnotes in this section.

- **Brownfield vs. Greenfield Development**

All four alternatives provide for growth by way of greenfield development⁶⁷. Alternative 3 provides a balance between brownfield/infill development while Alternatives 1, 2 and 4 provide for greater extents of greenfield development. Alternatives 1, 3 and 4 provide for E2 Employment uses at the Foggy Field to the immediate north east of the Kilruddery Estate. This provision could encourage ribbon development south of the roundabout in the direction of Greystones.

- **Biodiversity and Flora and Fauna**

None of the four alternatives would have a conflicting interaction with the protection of ecologically designated sites⁶⁸. Alternative 3 would not have a conflicting interaction with the protection of ecological connectivity⁶⁹ while Alternatives 1, 2 and 4 would all potentially conflict with ecological connectivity⁷⁰.

- **Flooding**

In the absence of mitigation potential conflicts could arise from increasing the risk of flooding⁷¹ within the Kilruddery area. Alternatives 1, 2 and 4 would pose the highest flood risk while the flood risk by Alternative 3 would be less. Conflicts and adverse effects with regard to flooding would be likely to be mitigated by measures detailed in Section 9 of this

report which include requirements for: the integration of Sustainable Urban Drainage Systems; the adoption of a sequential approach to flood risk management; and, the preparation of flood risk assessments.

- **Groundwater**

The vulnerability of the groundwater body underlying the Kilruddery area ranges from extreme to moderate. The Water Framework Directive Characterisation Report rates the groundwater body as being *at significant risk* of meeting the objectives of the Water Framework Directive by 2015. Groundwater beneath the Plan area is listed on the Water Framework Directive Register of Protected Areas for Drinking Water (Ground Water). Implementation of all Alternatives could conflict with the status of groundwaters⁷² - if unmitigated - by providing for the development of greenfield lands. As Alternatives 1, 2 and 4 provide for greater extents of greenfield development, these alternatives would be likely to result in the greatest effects upon the status of the groundwater body.

- **Waste Water Infrastructure, Bathing Water and Human Health**

Waste water from the Bray area currently undergoes primary treatment before being pumped into the sea through a long sea outfall. Waste water arising from the Bray area will undergo secondary treatment at Shanganagh beginning from 2011-2012. Should new development be permitted before this upgrade is operational with sufficient capacity then it is likely that waste water would not be treated in compliance with the Urban Waste Water Treatment Directive (Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment) (amended by Directive 98/15/EEC)⁷³. Increased volumes of primary treated waste water discharges into the sea which would arise from increases in population would be likely to reduce the

⁶⁷ SEO S1

⁶⁸ SEOs B1 and B2

⁶⁹ SEO B3

⁷⁰ SEO B3

⁷¹ SEO W3

⁷² SEO W2

⁷³ SEO M1

ability of the coastal water body off the coast of Bray to meet the *high status* objective of the Water Framework Directive. Such increases in the volume of discharges could also impact upon the ability of bathing water at Bray to comply with EU Mandatory Values (Acceptable Quality) which could affect human health⁷⁴.

Alternative 3 would require waste water treatment for the smallest new population of all alternatives while Alternative 4 would require waste water treatment for the largest new population of all alternatives. Alternatives 1 and 2 would require waste water treatment for similar numbers of new populations.

- **Greenhouse Gas Emissions and Car Dependency**

The interaction between all 4 Alternatives and the reduction of greenhouse gas emissions⁷⁵ and the minimisation of car dependency⁷⁶ is uncertain. It would be important that a sufficient public transport service is provided to all lands which are zoned for residential and employment development by the LAP.

- **Architectural and Archaeological Heritage**

There are 6 entries to the Record of Monuments and Places⁷⁷ (RMP) within the Kilruddery lands including a *possible burial ground, Kilruddery House* and 2 *Fulacht Fias*. It is possible that there is subterranean archaeological heritage beneath the subject lands which has not been identified to date. In order to prevent unnecessary impacts on archaeological heritage it will be necessary to carry out pre-development archaeological testing surveying, monitoring and recording.

By providing for development in the vicinity of the Protected Structure of Kilruddery House potential conflicts could arise between new development

and the protection of this structure, including its curtilage (the parcel of ground immediately associated with the structure or in use for the purposes of the structure)⁷⁸. The cultural heritage and historic importance of Kilruddery Estate could be cumulatively diminished by the continual selling of land facilitated by rezoning. Consequently, the form of any proposed development within Kilruddery Demesne should be informed by the protected status of the Kilruddery House and its curtilage and the consequent need to uphold the heritage value of the estate.

- **Landscape**

The eastern lands at Kilruddery are classified under the Wicklow County Development Plan 2004-2010 County Landscape Characterisation as being within a *Corridor Area* while the western lands are classified as being within an *Area of Outstanding Natural Beauty*. The *Area of Outstanding Natural Beauty* classification indicates that the western lands are of a high sensitivity and value on a County level. In addition, the eastern lands in Kilruddery are adjacent to an area under consideration for a Special Amenity Area Order.

All alternatives propose E2 Employment uses to the south of the existing business park. These lands are particularly visually prominent and sensitive due to the elevated and sloping character of the lands which are located in the vicinity of the Little Sugar Loaf. This land is highly visible from the Southern Cross Road and from other parts of Bray. Development of these lands should have regard to existing topography and minimise visual encroachment on the lower slopes of the Great Sugar Loaf⁷⁹.

Alternatives 1, 2 and 4 propose R4 low density residential development on the slopes of the Little Sugar Loaf. This development would be likely to significantly and adversely affect the landscape and would not be likely to be fully mitigated.

⁷⁴ SEO HH1

⁷⁵ SEO C1

⁷⁶ SEO M2

⁷⁷ SEO CH1

⁷⁸ SEO CH2

⁷⁹ SEO L1

7.5.2 Evaluation against SEO's

	Likely to Improve status of SEOs	Probable Conflict with status of SEOs - unlikely to be mitigated	Potential Conflict with status of SEOs - would be mitigated	Uncertain interaction with status of SEOs	Neutral Interaction with status of SEOs	No Likely interaction with status of SEOs
Alternative 1		L1	B3 S1 CH1 CH2 W2 M1 HH1 W3	C1 M2		B1 B2 W1
Alternative 2		L1	B3 S1 CH1 CH2 W2 M1 HH1 W3	C1 M2		B1 B2 W1
Alternative 3			S1 CH1 CH2 W2 M1 HH1 W3 L1	C1 M2		B1 B2 B3W1
Alternative 4		L1	B3 S1 CH1 CH2 W2 M1 HH1 W3	C1 M2		B1 B2 W1

Table 7.5 Evaluation of Alternative Scenarios against SEOs

7.5.3 Summary

Implementation of Alternative 3 for Kilruddery would be likely to result in the least amount and least severity of adverse effects on the environment while implementation of Alternative 4 for Kilruddery would be likely to result in the most amount and most severity of effects on the environment.

The potential conflicts and associated adverse effects of Alternative 3 would be likely to be avoided or reduced by complying with various aspects of the land use zoning objectives of the LAP and mitigation measures including those which are recommended to be integrated into the Plan (provided in Section 9 of the Environmental Report).

7.5.4 Kilruddery Component of the LAP

The Kilruddery component of the LAP that emerged from the Plan preparation process has a close correlation to Alternative 3. The evaluation presented for Alternative 3 over Sections 7.5.1 to 7.5.3 is generally applicable for the Kilruddery component of the LAP and it is accompanied by an evaluation of the provisions of the LAP in Section 8.

The Alternatives that were examined were produced and evaluated at an earlier - more embryonic - stage to facilitate evaluation and selection of a plan. Consequently there are a number of differences between Alternative 3 and the Kilruddery component of the LAP. These differences are indicated on

Figure 7.1 and Figure 7.2. The differences are identified and discussed below.

Difference 1

Lands zoned by Alternative 3 to the immediate south of the existing business park as *Employment* (E2) are zoned R3 *New Residential Low Density* by the LAP. These lands together with the adjacent lands zoned Open Space (OS) are not configured in the same way in the LAP as they are in Alternative 3 - the lands zoned *New Residential Low Density* in the LAP cover a greater area than those zoned *Employment* in Alternative 3.

Although this difference does not change the assessment provided for Alternative A above, it is noted that the LAP provides that *the elevation of the residential development shall be confined to a contour of no higher than 65 metres*. This

provision will positively impact upon the protection of the landscape.

Difference 2

The LAP provides for a between the Kilruddery Tourism zone and the Swanbrook and Hollybrook housing developments that is not provided for by Alternative 3. This buffer will positively impact upon the protection of the context of Kilruddery Demesne and the protection of ecological connectivity.

Difference 3

The E2 Employment - Industry/Business Park zoning of the Foggy Field area in Alternative 3 is zoned T - Tourism in the LAP. This difference does not change the assessment provided above for Alternative 3.

Difference 4

The majority of lands within the Plan boundary of Alternative 3 are not attributed a zoning. The LAP attributes a Green Belt zoning objective to these lands. As this Green Belt zoning will significantly restrict new built development, this difference would be likely to have significantly beneficial impacts upon the protection of the landscape, architectural heritage, archaeological heritage, ecological connectivity and non-designated flora and fauna.

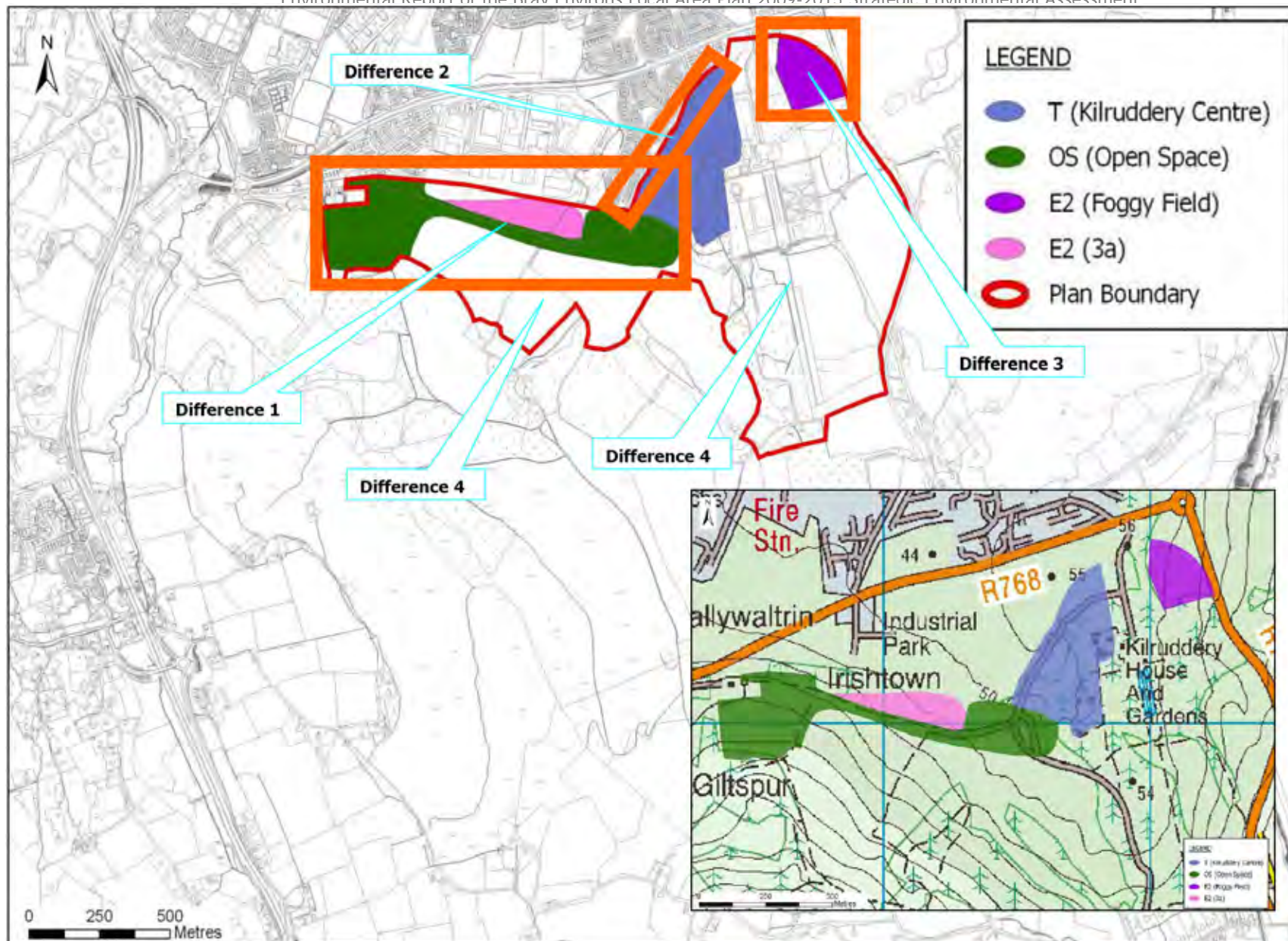


Figure 7.3 Kilruddery Land Use Alternative 3
(differences between this Alternative and the LAP are identified)

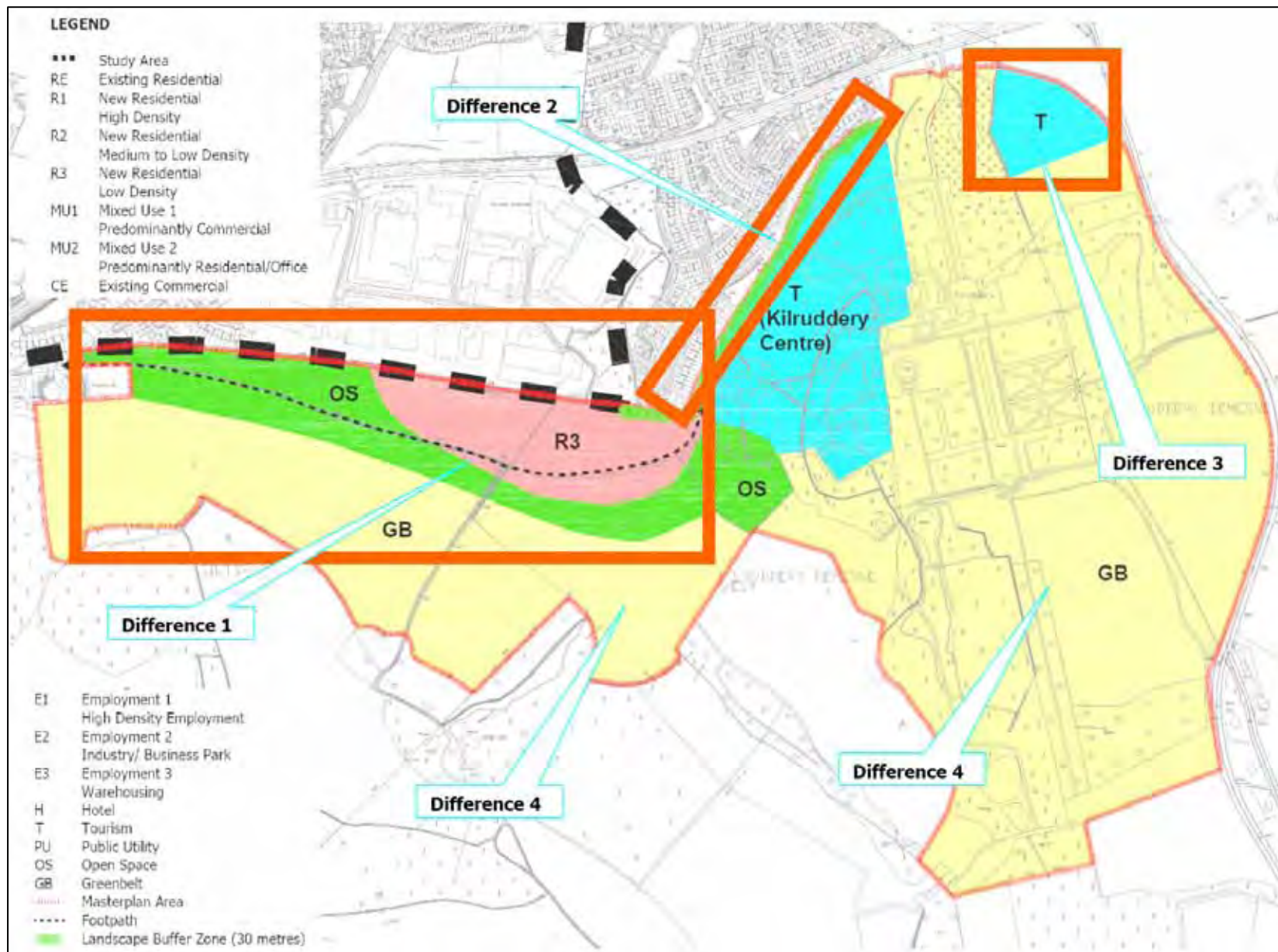


Figure 7.4 Kilruddery Land Use Zoning Map from the LAP
(differences between the LAP and Alternative 3 are identified)

Section 8 Evaluation of Plan Policies and Objectives

8.1 Methodology

This section evaluates the Local Area Plan's strategy, policies, objectives and standards. Strategic Environmental Objectives (SEOs) are used as outlined under Section 7.2.3 in order to evaluate the relevant measures of the LAP. Use has been made of the environmental baseline descriptions and the maps of the individual components provided in Section 3 for this purpose.

The interactions between the SEOs and the policies and objectives of the Plan determine the effects of implementing the Plan. These effects include secondary, cumulative, synergistic, short, medium and long-term permanent and temporary, positive and negative effects.

Table 8.1 brings together all the SEOs which have been developed from international, national, regional and county policies which generally govern environmental protection objectives.

Note re. Uncertainty of Plan Measures

With regard to strategies, policies, objectives and standards evaluated as having an uncertain interaction with the status of SEOs, the interaction, and environmental impacts, if any, which the implementation of these Plan measures would have would be determined by: the nature and extent of development arising from these Plan measures, and; site specific environmental factors. These impacts may be assessed as part of an EIA of a particular project and/or by the development management process.

Avoidance of conflict is dependent upon the development management process only granting permission for individual projects arising from these measures which do not conflict with the status of SEOs. Providing other Plan measures, including the measures recommended by this report, and measures arising out of lower tier assessments are complied with, conflicts with SEOs would be likely to be avoided.

SEO Code	SEO
B1	To avoid loss of relevant habitats, geological features, species or their sustaining resources in designated ecological sites
B2	To avoid significant adverse impacts, including direct, cumulative and indirect impacts, to relevant habitats, geological features, species or their sustaining resources in designated ecological sites by development within or adjacent to these sites
B3	To sustain, enhance or - where relevant - prevent the loss of ecological networks or parts thereof which provide significant connectivity between areas of local biodiversity
HH1	To protect human health from hazards or nuisances arising from exposure to incompatible landuses
S1	Maximise the sustainable re-use of brownfield lands, and maximise the use of the existing built environment rather than developing greenfield lands
W1	To maintain and improve, where possible, the quality of rivers and transitional waters
W2	To prevent pollution and contamination of ground water
W3	To prevent development on lands which pose - or are likely to pose in the future - a significant flood risk
C1	To minimise increases in travel related greenhouse emissions to air
M1	To serve new development with appropriate waste water treatment
M2	To reduce the overall proportion of car dependency within County Wicklow by way of, inter alia, encouraging modal change from car to more sustainable forms of public transport and encouraging development which will not be dependent on private transport
CH1	To protect archaeological heritage - including entries to the Record of Monuments and Places and unknown archaeology - and the context of the above within the surrounding landscape where relevant
CH2	To preserve and protect the special interest and character of architectural heritage with regard to entries to the Record of Protected Structures and their context within the surrounding landscape where relevant
L1	To avoid significant adverse impacts on the landscape, especially with regard to landscapes which are most valuable and most sensitive to change and views and prospects of special amenity

Table 8.1 Strategic Environmental Objectives (SEOs)⁸⁰

⁸⁰ Strategic Environmental Objectives (SEOs) are methodological measures which are developed from international, national, regional and county policies which generally govern environmental protection objectives and against which the environmental effects of the Plan can be tested. The SEOs are used as standards against which the development strategies, policies and objectives of the Plan can be evaluated in order to help identify areas in which significant adverse impacts are likely to occur, if unmitigated against.

8.2 Residential Development

	Likely to Improve status of SEOs	Probable Conflict with status of SEOs- unlikely to be mitigated	Potential Conflict with status of SEOs- likely to be mitigated	Uncertain interaction with status of SEOs	Neutral interaction with status of SEOs	No Likely interaction with status of SEOs
Policies and Objectives						
Notwithstanding the zoning of land for residential purposes, the Development Management process shall monitor and implement the 2010 and 2016 population targets and shall phase and restrict, where necessary, the granting of residential planning permissions to ensure these targets are not exceeded.				✓		
All planning applications must be accompanied by a sustainability assessment. Innovative design solutions, paying particular attention to environmental sustainability, will be supported subject to compliance with the objectives set out in this Plan and the principles of proper planning and sustainable development.				✓		
Provide for the consolidated and sustainable development of housing within the Plan area, incorporating the necessary physical, social, community and employment infrastructure to match the need of new residents.	M1 M2	S1	B1 B2 B3 HH1 W1 W2 W3 CH1 CH2 L1			
Protect existing residential amenity within the Plan area.				✓		
Facilitate higher residential densities at appropriate locations as per the zoning objectives, subject to a high standard of design, layout and finish.	C1 M2	S1	B3 HH1 W1 W2 W3 M1 CH1 CH2 L1			
Alternative and contemporary designs shall be encouraged (including alternative materials, heights and building forms) to provide for high quality visual diversity, legibility and permeability, subject to the protection of established amenity.	CH2					
Provide for a mix of residential types to ensure social integration and to meet the needs of different households, including the special requirements of elderly persons and persons with disabilities.						✓
Any development of the Dargle Road R2 zoned land shall include the construction of noise attenuation structures between the R2 lands and the N11. The visual impact of these structures shall be minimised by greening/tree planting measures.	HH1 L1					

8.3 Employment and Enterprise

	Likely to Improve status of SEOs	Probable Conflict with status of SEOs- unlikely to be mitigated	Potential Conflict with status of SEOs- likely to be mitigated	Uncertain interaction with status of SEOs	Neutral interaction with status of SEOs	No Likely interaction with status of SEOs
Policies and Objectives						
Promote the location of high-density employment uses in locations within or close to the core area and close to public transport nodes within Fassaroe.	C1 M2	S1	B3 W2 M1 HH1 W3 CH1 L1			B1 B2
Protect and enhance existing employment within Fassaroe, including the Greenstar waste recycling facility.			HH1			
Land to provide a 2,750 square metre Enterprise Centre shall be provided as part of the development of the Fassaroe development area. The location and detail of the centre shall be determined at master plan stage.	C1 M2		B3 W2 M1 HH1 W3 CH1 CH2 L1			
Provide for the development of a tourism/enterprise development on lands within the Kilruddery Demesne. Any proposal for development should be to a high quality of design and layout, and have particular regard for the surrounding environment and the protected status of the Demesne.			B3 W2 M1 HH1 W3 CH1 CH2 L1			
Provide for the development of a hotel within Kilruddery Demesne located south of the Southern Cross roundabout at the foot of Bray Head.			B3 W2 M1 HH1 W3 CH1 CH2 L1			
The employment component of the MU2 zone shall be located in close proximity to the core.	C1 M2					

8.4 Retail

	Likely to Improve status of SEOs	Probable Conflict with status of SEOs- unlikely to be mitigated	Potential Conflict with status of SEOs- likely to be mitigated	Uncertain interaction with status of SEOs	Neutral interaction with status of SEOs	No Likely interaction with status of SEOs
Policies and Objectives						
Within the core, retail/service use will be encouraged at street level to provide for a vibrant neighbourhood centre.	C1 M2		HH1			
Provide for small-scale retail facilities outside the core, subject to the protection of the identified neighbourhood centres and residential amenity.	CH2		HH1			

8.5 Social and Community Infrastructure

	Likely to Improve status of SEOs	Probable Conflict with status of SEOs- unlikely to be mitigated	Potential Conflict with status of SEOs- likely to be mitigated	Uncertain interaction with status of SEOs	Neutral interaction with status of SEOs	No Likely interaction with status of SEOs
Policies and Objectives						
Provide a District Park of 23 hectares within Fassaroe. The Park will consist of both active and passive open space, and include such facilities as outdoor playing pitches and other sports facilities for adults and children. This park will be sufficiently sized and laid out in order to accommodate both active and passive open space areas. The park will provide for recreational amenity requirements of the Fassaroe area, and for Bray town and the wider environs.	C1 M2 B3 L1		HH1			
A large community facility shall be provided in the core area of Fassaroe. At local neighbourhood level, facilities such as community meeting space and equipped play space/ informal youth hardcourt areas shall be provided. Community Meeting Space should be clustered with other local level development such as primary schools and neighbourhood retail, while approximately 5.6 ha of equipped play space/informal youth areas should shall be dispersed throughout the Plan area.	C1 M2	S1	B3 HH1 W2 W3 M1 CH1 L1			
A minimum of c. 3 ha shall be reserved for the provision of 2 no. primary schools within the Fassaroe area. It is a specific objective to provide a 2 x 16 classroom primary school requiring plots of between 1.14 ha. and 1.6 ha. The location of the primary schools, proximate to residential development, will be decided during the Masterplanning stage.	C1 M2	S1	B3 HH1 W2 W3 M1 CH1 L1			
A site of c. 5 ha shall be reserved for the purpose of providing a post-primary school to cater for up to 1,000 pupils. The location of the secondary school, proximate to residential development, will be decided during the Masterplanning stage.	C1 M2	S1	B3 HH1 W2 W3 M1 CH1 L1			
All significant developments within the Mixed Use zones (MU1 and MU2) shall be required to provide appropriate community facilities, to be determined through consultation with the Community & Enterprise Section of Wicklow County Council, including such facilities as a library, childcare facilities, medical centre etc.	C1 M2		B3 HH1 W2 W3 M1 CH1 L1			
Provide a greenbelt zone to the south of Fassaroe to protect the visual amenity of the area, and to act as a transition zone between the Plan area and unzoned lands to the south.	B3 L1					
Provide linear parks though the extent of zoned lands in both Fassaroe and Kilruddery Demesne as indicated on the relevant land use maps 4 & 5. A minimum width of 20 metres should be provided for this type of open space.	C1 M2 B3 L1		HH1			
All new public amenity areas shall be provided with safe pedestrian routes, as well as appropriate lighting and furniture.	C1 M2					
Provide for the appropriate amount of childcare facilities within residential zones, in accordance with Childcare Facilities Guidelines. Appropriate childcare facilities should also be provided within employment zones.	C1 M2					
15% of play/open space land shall be provided in residential areas in excess of the requirements set out above and in accordance with the provisions of the CDP.						✓
The Social & Community Infrastructure policies of the Draft LAP shall be reviewed by the Forward Planning Section of the Council in conjunction with the Integrated Planning Sub Group of Wicklow County Development Board. Where any recommendations subsequently made are deemed to be material the LAP shall be amended in accordance with the provisions of the Planning and Development Acts 2000 – 2006.				✓		

8.6 Traffic and Transportation

	Likely to Improve status of SEOs	Probable Conflict with status of SEOs- unlikely to be mitigated	Potential Conflict with status of SEOs- likely to be mitigated	Uncertain interaction with status of SEOs	Neutral interaction with status of SEOs	No Likely interaction with status of SEOs
Transport Policies and Objectives						
Promote sustainable travel patterns from new development through appropriate land use mixes and providing high levels of accessibility, by ensuring good permeability within the development and connectivity to surrounding areas.	C1 M2					
Ensure traffic calming principles are adopted as a design dynamic of new developments.	C1 M2					
Development proposals will be delivered in such a manner that sustainable transport principles can be supported. This will require consideration of public transport requirements, local road, pedestrian and cycle connections, and the need to protect the carrying capacity of the N11/M11 as a strategic road through the area.	C1 M2					
Wicklow County Council will progress the implementation of the Bray Public Transport Study recommendations in consultation with the QBN Project Office.	C1 M2					
The provision of the LUAS including its construction schedule shall be included in the Masterplan, including agreed phasing.	C1 M2					
Planning applications that are deemed to be significant in terms of traffic generation are required to include a Traffic & Transport Assessment, and a Road Safety Audit.	HH1					
Planning applications that are deemed to be significant in terms of traffic generation are required to have consideration for the Environmental Noise Regulations, published by the Department of Environment, Heritage and Local Government (S.I. No. 140 of 2006	HH1					
Roads Policies and Objectives						
Ensure sufficient land is reserved to provide for an east west link road known as Ballyman Link Road from the N11 to Ballyman.			B1 B2 B3 W1 L1 HH1			
Provide for a Western Link Road to connect Fassaroe with Old Connaught. It is intended that the bridge over the valley be designed to accommodate vehicular, pedestrian, cyclist and LUAS related traffic.	C1 M2		B3 W1 L1			
Public Transport Policies and Objectives						
Facilitate and support the Railway Procurement Agency (RPA) in works relating to the provision of LUAS services in Fassaroe.	C1 M2					
Ensure Park and Ride car parking, bus parking and bicycle spaces are provided at the LUAS stops to facilitate interchange between the various modes of transport. This will assist in providing an integrated public transport network.	C1 M2		HH1 W3			
A site of c. 6 ha shall be reserved for the provision of a LUAS Park and Ride facility within the core area.	C1 M2		HH1 W3			
A site shall be reserved for a LUAS stabling depot within the south-west sector including a land reservation for park and ride.	C1 M2		HH1 W3			
Incorporate bus priority measures in the design of new roads and improvements to existing roads as appropriate in the Plan area	C1 M2					

Pedestrian and Cyclist Policies and Objectives						
Encourage and promote cycling and walking efficiencies.	C1 M2					
Walking and cycling routes, along rivers and through all green space areas, shall be provided throughout the areas designated for development to ensure permeability within both Fassaroe and Kilruddery.	C1 M2					
Provide foot and cycle paths across the hotel zone at St. Valery's and through to the centre of Fassaroe.	C1 M2					
Provide adequate lighting along pedestrian and cycling routes.	C1 M2					
Improve pedestrian facilities on existing and proposed linkages through the provision of formal pedestrian crossings that are suitable for mobility impaired road users.	C1 M2					

8.7 Public Services Infrastructure

	Likely to Improve status of SEOs	Probable Conflict with status of SEOs- unlikely to be mitigated	Potential Conflict with status of SEOs- likely to be mitigated	Uncertain interaction with status of SEOs	Neutral interaction with status of SEOs	No Likely interaction with status of SEOs
Water Supply Policies and Objectives						
Development will not be permitted unless adequate water supply can be provided.				✓		
Investigate the possibility of constructing and source a location for a new high level reservoir to serve the Kilruddery area and provide additional supply to the Bray Town area.			L1 CH1 CH2	✓		
Support the use of water saving systems including rainwater harvesting and greywater recycling on all new developments.						✓
Waste and Surface Water Policies and Objectives						
Development will not be permitted unless treatment and distribution capacity can be provided.	M1			✓		
Ensure the implementation of Sustainable Urban Drainage Networks (SUDS) and compliance with the Greater Dublin Strategic Drainage Study (GDSDS) within developments.	HH1 W3					
Implement strict surface water discharge allowances from proposed development sites and encourage the use of SUDS measures to reduce surface water run off from proposed development sites to reduce the cumulative loading on the surface water network.	HH1 W2 W3					
It is the policy of the Council that a Flood Risk Assessment shall form part of the overall master plans for both Fassaroe & Kilruddery, to ensure that the development does not increase the flood risk in the relevant catchment. Any works required as a result of such assessment shall be carried out before any other development commences. For small developments less than 0.25 hectares, a certificate from an appropriately qualified specialist stating that the development will not contribute to flooding within the relevant catchment must accompany applications for planning permission. A Flood Impact Assessment shall identify potential loss of floodplain storage and how it would be offset in order to minimise impact on the river flood regime. It shall also take account of the possible effect on the natural resources of the river.	HH1 W3 B3					
For developments adjacent to watercourses of a significant conveyance capacity any structures must be set back from the edge of the watercourse to allow access for channel cleaning/maintenance.	B3					
Planning applications for development on or adjoining disused landfill sites must be accompanied by a comprehensive report outlining the content of the sites and any mitigation measures where appropriate to be implemented to ensure the protection of human and environmental health during the construction and operation of the proposed development	HH1 W1 W2					
All applications for development should have regard for the draft guidelines for managing flood risk as published by the Department of Environment, Heritage and Local Government ('The Planning System and Flood Risk Management') and the adopted guidelines as and when appropriate.	HH1 W3 B3					

Energy and Communication Networks Policies and Objectives						
To support and facilitate the provision of improved energy supplies and telecommunication networks to the area in order to support economic and social development.				✓		
In order to adhere to the energy conservation policies outlined in the Bray Town Development Plan, and improve the energy performance of new developments within the Plan area, the Council will: 1. Encourage responsible environmental management in construction 2. Promote sustainable approaches to housing developments through spatial planning, layout, design and detailed specification 3. Ensure high standards of energy efficiency in all housing developments under its remit, and encourage developers, owners, and tenants to improve the environmental performance of the building stock, including the deployment of renewable energy 4. For all developments, apply an improvement of either of 40% or 60% (depending on certain criteria) relative to prevailing norms as represented by the Building Regulations Part L.	C1 M2					
Facilitate the provision of 'Bring Centres' in suitable locations to encourage recycling of waste materials.				✓		

8.8 Built and Cultural Heritage

	Likely to Improve status of SEOs	Probable Conflict with status of SEOs- unlikely to be mitigated	Potential Conflict with status of SEOs- likely to be mitigated	Uncertain interaction with status of SEOs	Neutral interaction with status of SEOs	No Likely interaction with status of SEOs
Built Heritage Policies and Objectives						
Protect the built and cultural heritage of Kilruddery Demesne.	CH1 CH2 L1					
Proposals for the development of the Kilruddery Demesne shall, as part of the masterplan, outline how the proposal fits with the estate and the objectives for its conservation				✓		
At masterplan stage all recorded monuments in the study area shall be listed and mapped, including St. Valery's Cross and Fassaroe Castle Pre-development archaeological testing surveying, monitoring and recording shall be carried out as appropriate, where proposals for development occur in the vicinity of known Archaeological sites.	CH1					
Natural heritage Policies and Objectives						
Wicklow County Council shall ensure the protection of existing ecological corridors including rivers, streams, hedgerows, trees, wooded areas, scrub and traditional stone walls. All proposals for development shall be required to identify all ecological corridors, assess the impact of the proposal on these and set out detailed mitigation measures to offset any negative impact.	B1 B2 B3 W1 L1					
The council shall ensure the protection of all trees of environmental, landscape and amenity value. Proposals which require the felling of these trees to facilitate development shall be discouraged.	B3 L1					
All proposals for development will be required to submit a tree impact assessment and mitigation plans as part of the masterplanning application.	B3 L1					
Buffer zones shall be put in place along watercourses to conserve the ecological value of these areas and to enhance their role as green corridors. Where open space zoning is proposed along watercourses masterplan criteria shall actively strive to conserve and enhance biodiversity.	B1 B2 B3 W1 L1					

8.9 Landscape and Natural & Visual Amenity

	Likely to Improve status of SEOs	Probable Conflict with status of SEOs- unlikely to be mitigated	Potential Conflict with status of SEOs- likely to be mitigated	Uncertain interaction with status of SEOs	Neutral interaction with status of SEOs	No Likely interaction with status of SEOs
Policies and Objectives						
To have regard to the existing landscape and visual character in the context of the developments proposed.	L1					
Protect views or prospects of special amenity value.	L1					
Protect the value and amenity of designated areas.	B1 B2 B3					
Create a network of public open space to ensure the maintenance of certain views across the lands from Carrigolan and the Sugar Loaf Mountain.	L1					
Provide pedestrian connections into Ballyman Glen to harness its potential as a local amenity.						✓
Protect the integrity of the Ballyman Glen and the Dargle and Cookstown River Valleys.	L1 B3					
The masterplan shall be subject to enhanced requirements in terms of visual impact assessment, integration of the design into the surrounding landscape, and use of appropriate tree planting and landscaping, preferably predominantly of native species.	L1					
The design and landscaping of all open spaces shall demonstrate best practice in terms of identifying local biodiversity value, retaining riparian vegetation, avoidance of disturbance to wildlife and promoting active biodiversity enhancement.	B3					
Development proposals shall be accompanied by a visual impact assessment demonstrating that landscape impacts have been anticipated to a level consistent with the sensitivity of the landscape.	L1					
Wicklow County Council will work with landowners and other interested groups to establish a clearly identifiable internal walk within the estate that could be connected to external walks with an intention of connecting to the Wicklow Way, to coastal walks and public transport.	C1 M2					

8.10 Phasing and Implementation

	Likely to Improve status of SEOs	Probable Conflict with status of SEOs- unlikely to be mitigated	Potential Conflict with status of SEOs- unlikely to be mitigated	Uncertain interaction with status of SEOs	Neutral interaction with status of SEOs	No Likely interaction with status of SEOs
<p>Lands zoned within the Kilruddery Demesne shall be developed in a comprehensive manner that allows for the sustainable, phased and managed development of the demesne during the plan period. In this regard, before any application for permission is considered, the developer/landowner shall agree an action area plan for the entire demesne which shall comply with the following requirements:</p> <ul style="list-style-type: none"> • It shall indicate the proposed mixed use development proposals to ensure the viability of the resource and have regard to the components of the LAP of relevance to the demesne • Separate applications for the development of the demesne will not be considered until an overall action plan has been agreed in writing with the Planning Authority • Phasing shall include details of the schedule and extent of all works to be undertaken at all stages. Where the initial or an early phase of the development includes residential lands the quantum of residential development to be agreed shall only be such as to ensure the viability of the remaining phases. The underlying basis of the phasing shall be to ensure the delivery of the development of the tourism potential of Kilruddery. • The elevation of the residential development shall be confined to a contour of no higher than 65 metres. A 30 metre mixed deciduous and evergreen tree planted buffer zone shall be provided between the Kilruddery T zone and the Swanbrook and Hollybrook housing developments. The buffer will be extended west where it adjoins the southern boundary of the Hollybrook houses. The existing mound to the rear of Hollybrook shall be continued where it is absent, subject to this not exacerbating flooding. • The Action Area shall on the zoning map include the provision of a walking route as shown and the provision of a walkway through the estate to the Little Sugar Loaf mountain and west to the Demesne boundaries. This walkway shall be a managed walkway to ensure that anti-social behaviour does not occur. • The Action Area Plan shall include tree surveys of the development lands, and shall specify measures for tree protection and proposals to carry out extensive tree planting to enhance the sylvan character of the development area. • The Action Area Plan shall provide details of the conservation and maintenance of the existing Demesne landscape and buildings. • The Action Area Plan shall provide for a vehicular access to all proposed developments via the existing access to Kilruddery from the Bray Southern Cross Route. • No pedestrian or vehicular access shall be permitted via the Earlscroft, Swanbrook, Hollybrook or Deepdales housing developments 	L1 C1 M2 B3 HH1					

Section 9 Mitigation Measures

9.1 Introduction

Mitigation measures are measures envisaged to prevent, reduce and, as fully as possible, offset any significant adverse impacts on the environment of implementing the Local Area Plan (LAP).

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

The mitigation measures may be incorporated into the briefing of design teams as well as the subsequent design, specification and development management of the landuses to be accommodated on the LAP lands.

Additional more detailed mitigation measures to those integrated into the LAP would be likely to be required by the development management and EIA processes of individual projects.

9.2 SEA Recommendation

The mitigation measures detailed under Section 9.3 were recommended to be integrated into and adopted as part of the Local Area Plan.

Note: The wordings of measures contained hereafter constitute an undertaking - as per the most relevant equivalent Irish Guidelines on the best practice⁸¹. Accordingly Mitigation measures contained hereafter should be

⁸¹ The most commonly encountered and significant problem in Environmental Impact Statements is the complete or partial omission of any clear, legally enforceable commitment to undertake the mitigation measures proposed in response to a predicted impact. EPA (2003) *Advice notes on Current Practice (In the Preparation in of Environmental Impact Statements)* Wexford: EPA

incorporated in their entirety - or should be omitted. The degree of undertaking should remain as that the measure 'shall' or 'will' be implemented. The substitution of these words with the words 'should', 'ought' or 'may' is not in accordance with best practice and should be avoided.

9.3 Mitigation Measures

9.3.1 Biodiversity and Flora and Fauna I

No projects giving rise to significant adverse direct, indirect or secondary impacts on Natura 2000 sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall be permitted on the basis of this Plan (either individually or in combination with other plans or projects)⁸².

9.3.2 Biodiversity and Flora and Fauna II

Where required, land use plans and projects arising from this plan will be screened for the need to undertake Appropriate Assessment under Article 6 of the Habitats Directive.

9.3.3 Biodiversity and Flora and Fauna III

Wicklow County Council shall ensure the protection of existing ecological corridors including rivers, streams, hedgerows, trees, wooded areas, scrub and traditional stone walls. All proposals for development shall be required to identify all ecological corridors, assess the impact of the proposal on these and set out

⁸² Except as provided for in Section 6(4) of the Habitats Directive, viz. There must be:
(a) no alternative solution available,
(b) imperative reasons of overriding public interest for the plan to proceed; and
(c) adequate compensatory measures in place.

detailed mitigation measures to offset any negative impact.

9.3.4 Biodiversity and Flora and Fauna IV

Any road project which involves crossing a Natura 2000 site will:

- Demonstrate the need for the project in light of a 'do nothing' context;
- Examine the potential for intensifying/upgrading existing roads and routes as an alternative to carrying out new road development affecting a *Natura 2000* site;
- Develop and evaluate a comprehensive series of plausible alternative routes and design strategies (the latter to include long span and tunnel options);
- Demonstrate how each route has been taken due account of, and accommodated, ecological considerations and legislative requirements; and,
- Demonstrate that the chosen route will not cause any incursions onto or significant adverse effects on these habitats.

9.3.5 Water Protection I

When published, the relevant policies and objectives of the Eastern River Basin Management Plan and associated Programme of Measures shall be integrated into the Plan through amendment or otherwise.

9.3.6 Water Protection II

Developments provided for by the Plan shall be undertaken in such a way so as not to compromise the quality of surface water (and associated habitats and species) and groundwater within the zones of influence of the Plan area.

9.3.7 Water Protection III

Landuses shall not give rise to the pollution of ground or surface waters during the construction or operation of developments. This shall be achieved through the adherence to best practice in the design, installation and management of systems for the interception,

collection and appropriate disposal or treatment of all surface waters and effluents.

9.3.8 Waste Water I

Public wastewater collection and treatment infrastructure - which fully complies with requirements of the Urban Waste Water Treatment Directive (Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment) (amended by Directive 98/15/EEC) including the need to provide secondary treatment - shall be operational and with adequate capacity to accommodate waste water arising from the development, prior to developments being occupied. Discharges arising from this collection and treatment shall also comply with the requirements of the Directive.

9.3.9 Waste Water II

Wicklow County Council shall work alongside Dún Laoghaire-Rathdown County Council to help ensure that the relevant recommendations set out in *Urban Waste Water Discharges in Ireland for Population Equivalents Greater than 500 Persons – A Report for the Years 2004 and 2005* (Office of Environment Enforcement - EPA, 2007) are implemented.

9.3.10 Waste Water III

The feasibility of connecting of unsewered, areas including individual properties/ premises, serviced by septic tanks to existing and planned sewer networks shall be examined.

9.3.11 Drinking Water I

Conformity with the relevant recommendations set out in *The Provision and Quality of Drinking Water in Ireland – A Report for the Years 2006-2007* (Office of Environment Enforcement- EPA, 2007) shall be achieved.

9.3.12 Drinking Water II

Existing and new populations under the LAP shall be served with clean and wholesome drinking water.

9.3.13 Drinking Water III

Compliance shall be achieved with the 48 parameters set out under the European

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

9.3.14 Flooding I

Proposals for development shall be required, where relevant, to integrate adequate and appropriate Sustainable Urban Drainage Systems (SUDS) and comply with the provisions of the Greater Dublin Strategic Drainage Study.

9.3.15 Flooding II

Development in areas at risk of flooding, particularly floodplains, shall be avoided by not permitting development in flood risk areas unless: it is fully justified that there are wider sustainability grounds for appropriate development; unless the flood risk can be managed to an acceptable level without increasing flood risk elsewhere; and, where possible, it reduces flood risk overall.

9.3.16 Flooding III

A sequential approach to flood risk management based on avoidance, reduction and then mitigation of flood risk as the overall framework for assessing the location of new development shall be adopted.

9.3.17 Flooding IV

Flood risk assessments shall accompany planning applications and these assessments shall be incorporated into the process of making decisions on planning applications and planning appeals.

9.3.18 Old Landfills I

Wicklow County Council shall ensure that adequate and appropriate investigations are carried out into the nature and extent of old landfills, the nature and extent of soil and groundwater contamination arising and the risks associated with site development work or proximate development. These risks shall be mitigated by Wicklow County Council by order or otherwise before development takes place.

9.3.19 Archaeological Heritage I

Landuses shall not give rise to significant losses of the integrity, quality or context of archaeological material - except as may be

conditioned or directed by the appropriate heritage agencies. This shall be achieved by the application of appropriate design standards and criteria.

9.3.20 Architectural Heritage I

New developments shall not result in any significant loss in the architectural integrity, quality or character of the area, where appropriate. Planning applications may be required to be accompanied by an assessment undertaken by an accredited conservation architect, where appropriate, detailing the impacts of the relevant development upon the special interest and character of the surrounding architectural heritage. Wicklow County Council shall be consulted at an early stage in this regard in order to determine whether there is a need for such an assessment or for specific mitigation measures.

9.3.21 Architectural Heritage II

In order to protect, strengthen and improve the presentation and the general character of the Plan area, alterations and interventions to Protected Structures shall be executed to the highest conservation standards (Venice Charter and subsequent ICOMOS Charters), and shall not detract from their significance or value.

9.3.22 Architectural Heritage III

Planning applications for developments in sensitive areas shall be accompanied by an assessment undertaken by an accredited conservation architect, where appropriate, detailing the impacts of the proposed development upon the special interest and character of the surrounding architectural heritage. The relevant Planning Authority shall be consulted at an early stage in this regard in order to determine whether there is a need for such an assessment or for specific mitigation measures.

9.3.23 Architectural Heritage IV

The Record of Protected Structures shall be extended on a phased basis, as appropriate, in order to incorporate any recommendations from the National Inventory of Architectural Heritage.

9.3.24 Air and Climatic Factors I

consistent with the sensitivity of the landscape.

Wicklow County Council shall protect air quality in the Bray Environs areas zoned for increased urban development and transport related development.

9.3.25 Transportation I

Traffic management measures to reduce the potential for traffic congestion and associated vehicular emissions within and emanating from the Plan areas where issues relating to traffic congestion and associated vehicular emissions arise will be implemented.

9.3.26 Waste Management I

An integrated approach to waste management for proposed developments - to include wastes generated during the construction, operation and maintenance phases - shall be implemented, having particular regard to Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (DEHLG, July 2006).

9.3.27 Energy/ Energy Conservation I

Energy conservation measures shall be promoted and the use of renewable energy systems in new developments which are provided for by the LAP.

9.3.28 Amendments to Wording of Policies Required - Landscape

Change the wording of the following policy:

Development proposals shall be accompanied by a visual impact assessment demonstrating that landscape impacts have been anticipated to a level consistent with the sensitivity of the landscape.

To:

Development proposals shall be accompanied by a visual impact assessment demonstrating that landscape impacts have been anticipated and avoided to a level

Section 10 Monitoring Measures

10.1 Introduction

The SEA Directive requires that the significant environmental effects of the implementation of plans and programmes are monitored. This environmental report puts forward proposals for monitoring the likely significant environmental effects of implementing the Local Area Plan (LAP).

Monitoring enables, at an early stage, the identification of unforeseen adverse effects and the undertaking of appropriate remedial action. In addition to this, monitoring can also play an important role in assessing whether the LAP is achieving its environmental objectives and targets - measures which the LAP can help work towards - whether these need to be reexamined and whether the proposed mitigation measures are being implemented.

10.2 Indicators and Targets

Monitoring is based around the indicators which were chosen earlier in the process. These indicators allow quantitative measures of trends and progress over time relating to the Strategic Environmental Objectives used in the evaluation. Focus is given to indicators which are relevant to the likely significant environmental effects of implementing the LAP and existing monitoring arrangements will be used in order to monitor the selected indicators. Each indicator to be monitored will be accompanied by the relevant target(s) which were identified with regard to the relevant legislation (see Section 4).

Table 10.1 below shows the indicator and targets which have been selected with regard to the monitoring of the Plan.

10.3 Sources

Measurements for indicators should come from existing monitoring sources and no new monitoring should be required to take place. Existing monitoring sources exist for each of the indicators and include those maintained by Wicklow County Council and the relevant authorities e.g. the Environmental Protection

Agency, the National Parks and Wildlife Service and the Central Statistics Office.

The *Development Management Process* in Wicklow County Council will provide passive monitoring of various indicators and targets on an application by application basis. Where significant adverse effects - including positive, negative, cumulative and indirect - are likely to occur upon, for example, entries to the RMP, entries to the RPS or ecological networks as a result of the undertaking of individual projects or multiple individual projects such instances should be identified and recorded and should feed into the monitoring evaluation.

10.3.1 Excluded Indicators and Targets

As noted on Table 10.1 below, monitoring data on Indicator W2 (Groundwater Quality Standards and Threshold Values under Directive 2006/118/EC) may not be available for the preliminary monitoring evaluation as the groundwater threshold values to which this indicator relates have not yet been identified by the EPA.

In addition, future monitoring data for Indicators C1i (Percentage of population within the Plan area travelling to work or school by public transport or non-mechanical means) and C1ii (Average distance travelled to work or school by the population of the LAP area) will not be available until the results of the next CSO Census are made available. It is recommended that data for these indicators be sourced for the SEA of the next review of the Plan.

10.4 Reporting

A preliminary monitoring evaluation report on the effects of implementing the LAP will be prepared within two years of the making of the Plan.

10.5 Responsibility

Wicklow County Council are responsible for collating existing relevant monitored data, the preparation of a monitoring report, the

publication of this report and, if necessary, the carrying out of corrective action.

It is recommended that a Steering Committee be established to oversee the monitoring process.

10.6 Thresholds

Appropriate thresholds will be set for the monitoring programme before the Plan and Environmental Report are adopted. These may include, for example:

- boil notices on drinking water;
- fish kills;
- complaints received from statutory consultees regarding avoidable impacts resulting from development which is granted permission under the LAP; and,
- court cases taken by the DEHLG regarding impacts upon archaeological heritage including entries to the Record of Monuments and Places.

Environmental Component	Selected Indicator(s)	Selected Target(s)	Source
Biodiversity, Flora and Fauna	<p>B1: Percentage of relevant habitats and designated ecological sites lost as a result of implementation of the LAP</p> <p>B2: Number of significant adverse impacts, including direct, cumulative and indirect impacts, to relevant habitats, geological features, species or their sustaining resources in designated ecological sites by development within or adjacent to these sites as a result of implementation of the LAP</p> <p>B3: Percentage loss of connectivity between areas of local biodiversity as a result of implementation of the LAP - as evidenced from a resurvey of CORINE mapping</p>	<p>B1: No losses of relevant habitats, species or their sustaining resources in designated ecological sites as a result of implementation of the LAP</p> <p>B2: No significant adverse impacts, including direct, cumulative and indirect impacts, to relevant habitats, geological features, species or their sustaining resources in designated ecological sites by development within or adjacent to these sites as a result of implementation of the LAP</p> <p>B3: No ecological networks or parts thereof which provide significant connectivity between areas of local biodiversity to be lost without remediation as a result of implementation of the LAP</p>	<p>CORINE Mapping, NPWS Records & Development Management Process in Wicklow County Council</p> <p>Development Management Process in Wicklow County Council & Consultation with the National Parks and Wildlife Service</p> <p>CORINE mapping</p>
Population and Human Health	<p>HH1: Occurrence (any) of a spatially concentrated deterioration in human health</p>	<p>HH1: No spatial concentrations of health problems arising from environmental factors</p>	<p>Wicklow County Council, EPA, Health and Safety Authority</p>
Soil	<p>S1: Area of brownfield land developed over the Plan period.</p>	<p>S1: Reduced availability of brownfield land (subject to availability on the open market, the demand for such land and the ability for such lands to be sustainably re-used within the provisions of the LAP) at the end of the LAP lifespan</p>	<p>Development Management Process in Wicklow County Council</p>

Environmental Component	Selected Indicator(s)	Selected Target(s)	Sources
Water	<p>Indicator W1i: Biotic Quality Rating (Q Value)</p> <p>W1ii: Trophic Status (ATSEBI)</p> <p>W2: Groundwater Quality Standards and Threshold Values under Directive 2006/118/EC</p> <p>W3: Number of developments granted permission on lands which pose - or are likely to pose in the future - a significant flood risk</p>	<p>W1ia: To maintain a biotic quality rating of Q4, in line with the requirement to achieve good water status under the Water Framework Directive, by 2015</p> <p>W1ib: To improve biotic quality ratings, where possible, to Q5</p> <p>W1ii: To maintain or to improve trophic status, where relevant, to unpolluted in line with the requirement to achieve good water status under the Water Framework Directive, by 2015</p> <p>W2: Compliance with Groundwater Quality Standards and Threshold Values under Directive 2006/118/EC</p> <p>W3: Minimise developments granted permission on lands which pose - or are likely to pose in the future - a significant flood risk</p>	<p>Environmental Protection Agency</p> <p>Environmental Protection Agency</p> <p>As noted under Section 10.3.1, monitoring data may not be available for this indicator when the monitoring evaluation is being prepared.</p> <p>Environmental Protection Agency</p> <p>Development Management Process in Wicklow County Council</p>
Air and Climatic Factors	<p>C1i: Percentage of population within the Plan area travelling to work or school by public transport or non-mechanical means</p> <p>C1ii: Average distance travelled to work or school by the population of the LAP area</p>	<p>C1i: An increase in the percentage of the population travelling to work or school by public transport or non-mechanical means</p> <p>C1ii: A decrease in the average distance travelled to work or school by the population of the LAP area</p>	<p>Central Statistics Office:</p> <p>As noted under Section 10.3.1, future monitoring data may not be available for these indicators until results from the next Census are made available.</p>

Environmental Component	Selected Indicator(s)	Selected Target(s)	Sources
Material Assets	M1: Number of new developments granted permission which cannot be adequately served by a public waste water treatment plant over the lifetime of the LAP	M1: No new developments granted permission which cannot be adequately served by a public waste water treatment plant over the lifetime of the LAP	Development Management Process in Wicklow County Council
Cultural Heritage	<p>CH1: Number of unauthorised developments occurring which result in full or partial loss to archaeological heritage - including entries to the Record of Monuments and Places and unknown archaeology - and the context of the above within the surrounding landscape where relevant</p> <p>CH2i: Number of unauthorised developments occurring which result in physical loss or loss entries to the Record of Protected Structures and/or their context within the surrounding landscape where relevant</p> <p>CH2ii: Number of additions to the Record of Protected Structures and the number of additional ACAs and comparison with the NIAH</p>	<p>CH1: No unauthorised developments occurring which result in full or partial loss to archaeological heritage - including entries to the Record of Monuments and Places and unknown archaeology - and the context of the above within the surrounding landscape where relevant</p> <p>CH2i: No unauthorised developments occurring which result in physical loss or loss entries to the Record of Protected Structures and/or their context within the surrounding landscape where relevant</p> <p>CH2ii: Make Additions to the Record of Protected Structures and make additional ACAs, where appropriate</p>	<p>Development Management Process in Wicklow County Council</p> <p>Development Management Process in Wicklow County Council</p> <p>Development Management Process in Wicklow County Council</p>
Landscape	L1: Number of complaints received from statutory consultees regarding avoidable impacts resulting from development which is granted permission under the LAP	L1: No developments permitted which result in avoidable impacts on visually prominent landscapes and protected focal points and views	Development Management Process in Wicklow County Council

Table 10.1 Selected Indicators, Targets and Monitoring Sources

Appendix I Site Synopses

Special Areas of Conservation⁸³

Site Name: Ballyman Glen cSAC and pNHA Site Code: 000713

Ballyman Glen is situated approximately 3 km north of Enniskerry. It is orientated in an east-west direction with a stream running through the centre. The glen is bounded mostly by steeply sloping pasture with Gorse (*Ulex europaeus*) and areas of wood and scrub. This site is a candidate SAC selected for alkaline fen and petrifying springs, both habitats listed on Annex I of the EU Habitats Directive. The glen contains a small strip of fen, which runs along the county boundary and extends into County Dublin. This fen is very alkaline and is associated with petrifying spring/seepage areas that have given rise to thick deposits of marl. The vegetation of the main part of the fen is dominated by Greater Tussock-sedge (*Carex paniculata*), Tall Fescue (*Festuca arundinacea*), Butterworts (*Pinguicula vulgaris* and *P. lusitanica*), Black Bog-rush (*Schoenus nigricans*) and Broad-leaved Cottongrass (*Eriophorum latifolium*). The site is particularly notable for its orchids, which includes Early Marsh-orchid (*Dactylorhiza incarnata*), Narrow-leaved Marsh-orchid (*D. traunsteineri*) and Marsh Helleborine (*Epipactis palustris*). In addition, twenty species of sedge have been recorded in the area, including the scarce Long-stalked Yellow-sedge (*Carex lepidocarpa*). The fen area is being invaded by Downy Birch (*Betula pubescens*). Associated with the fen, and also with the woodland elsewhere in the site, are petrifying springs. These lime-encrusted seepage areas are rich in bryophytes including such diagnostic species as Great Horsetail (*Equisetum telmateia*), *Cratoneuron commutatum* and *C. filicinum*. Wet woodland and scrub occur along the margins of the stream for most of the length of the glen, extending outwards in areas to create inaccessible and species-rich patches of woodland. The canopy is dominated by Alder (*Alnus glutinosa*), Willow (*Salix* spp.) and Ash (*Fraxinus excelsior*). The woodland has a dense shrub layer which includes Hawthorn (*Crataegus monogyna*) and Spindle (*Euonymus europaeus*), and a diverse ground flora with Marsh Hawks-beard (*Crepis paludosa*), Sanicle (*Sanicula europaea*), Herb-Robert (*Geranium robertianum*), Bugle (*Ajuga reptans*), Horsetails (*Equisetum* spp.), Meadowsweet (*Filipendula ulmaria*) and some sedges (*Carex* spp.). Areas of marsh are found in the wetter areas by the stream, particularly at the western end of the site. There is an area of broad-leaved woodland on the steeper southern slopes of the glen. Common species occurring here are Ash and Sycamore (*Acer pseudoplatanus*), with Brambles (*Rubus fruticosus* agg.) colonizing the more open areas. An area of land that slopes towards the fen has been used as a landfill site for domestic refuse. The site is also used a clay pigeon shoot and shattered clay pigeons are scattered throughout the area. Fens are rare in Wicklow/Dublin and this is one of only two sites in Wicklow for the Narrow-leaved Marsh-orchid. The fen vegetation is well developed, with an unusually large number of sedge species present. The presence of alkaline fen and of petrifying spring/seepage areas on the site is particularly notable, as these habitats are listed, the latter with priority status, on Annex I of the EU Habitats Directive.

30.10.2002

Site Name: Bray Head cSAC and pNHA Site Code: 000714

This coastal site is situated in the north-east of Co. Wicklow between the towns of Bray and Greystones. Bedrock geology is Cambrian quartzites and shales (with mudstones and greywackes). Bray Head consists of a plateau of high ground, with five prominent quartzite knolls and has a maximum height of 241 m. The more exposed higher ground has a covering of shallow acidic soils, with protruding bedrock and scree. Elsewhere, deeper soils are formed by drift deposits, calcareous in character. Heath, a habitat listed on Annex I of the EU Habitats Directive, is the principal habitat over much of the Head. The vegetation of the upper plateau area is dominated by dwarf shrubs, mainly Ling (*Calluna vulgaris*), Bell Heather (*Erica cinerea*) and Gorse (*Ulex europaeus* and *U. gallii*). Broom (*Cytisus scoparius*) also occurs and associated with the gorse and broom is the Red Data Book species Greater Broomrape (*Orobanche rapum-genistae*). In the areas where the shrubs are less dense Tormentil (*Potentilla erecta*), Milkwort (*Polygala vulgaris*), Heath Bedstraw (*Galium saxatile*) and a variety of grasses (e.g. *Aira praecox*, *Agrostis tenuis*, *Deschampsia flexuosa*) are present. Where rock outcrops occur species such as English Stonecrop (*Sedum anglicum*) and Sheep's-bit Scabious (*Jasione montana*) are found. Bracken (*Pteridium aquiliforme*) is dominant in some areas. The heath communities which occur on the dry slopes above the sea-cliffs, especially those south-facing, are more open in character and dominated by grasses rather than dwarf shrubs. The annual plant communities which develop here are very typical of those found only on sites in south-eastern Ireland. Common species include Wood Sage (*Teucrium scordonia*), clovers (*Trifolium dubium*, *T. campestre*), Scarlet Pimpernel (*Anagallis arvensis*) and Field Madder (*Sherardia arvensis*). An uncommon annual species which can appear abundantly in the heath after a fire event is Yellow Fumitory (*Corydalis claviculata*). Some rare plants are found in this habitat, notably Bird's-foot (*Ornithopus perpusillus*) and Spring Vetch (*Vicia lathyrroides*), both Red Data Book species. Calcareous dry grassland, typically species-rich, occurs on deposits of glacial till. The primary grass species are Quaking Grass (*Briza media*), Smooth Meadow-grass (*Poa pratensis*) and Red Fescue (*Festuca rubra*). Typical calcicole herbs include Pale Flax (*Linum bienne*), Salad Burnet (*Sanguisorba minor*), Burnet-saxifrage (*Pimpinella saxifrage*), Carlina Thistle (*Carlina vulgaris*) and Kidney Vetch (*Anthyllis vulneraria*). Orchids are a feature of this habitat, with five species known from the area - Pyramidal Orchid (*Anacamptis pyramidalis*), Common Spotted Orchid (*Dactylorhiza fuchsii*), Common Twayblade (*Listera ovata*), Fragrant Orchid (*Gymnadenia conopsea*) and Bee Orchid (*Ophrys apifera*). Bloody Crane's-bill (*Geranium sanguineum*) was re-found recently in this community at Bray Head - this is a typical species of the Burren and is very rare in eastern Ireland. Rocky sea cliffs, another Annex I habitat, form most of the seaward boundary at this site and extend for approximately 2 km. Steep clay cliffs extend southwards for a further 1 km, with a small area of clay cliff also at the northernmost part of site. The rocky cliffs are divided by a railway track built in the 1800s. The lower cliffs are fairly steep in places but above the track they are less steep and often support heath or dry grassland vegetation. In parts the cliffs are up to 60 m in height. Typical species of the more exposed rock areas are Common Scurvy-grass (*Cochlearia officinalis*), Rock Spurrey (*Spergularia rupicola*), Thrift (*Armeria maritima*), Sea Campion (*Silene maritima*), and Sea Samphire (*Crithmum maritimum*). On some

⁸³ By e-mail from National Parks and Wildlife Service Dublin

sections of the cliff face, the locally scarce Tree Mallow (*Lavatera arborea*) is found. Species of the upper cliff flora include Kidney Vetch (*Anthyllis vulneraria*) and Red Fescue. A widespread species found from the mid to upper zones of the cliff face is Ivy (*Hedera helix*). Associated with the Ivy is the scarce *Rubia peregrina*. The clay cliffs in the southern part of the site are steep and unstable and have little vegetation. A stand of mostly native woodland occurs in the northern part of the site. This is a fairly pure Sessile Oak (*Quercus petraea*) dominated woodland, with some Ash (*Fraxinus excelsior*) and Birch (*Betula pubescens*). Understorey trees which occur are Holly (*Ilex aquifolium*) and Hawthorn (*Crataegus monogyna*). The wood is on shallow drift and the ground flora often has species more associated with heath than woodlands. Other habitats which are found at this site include bedrock shore, a sandy/shingle beach and an area of shallow marine water. Bray Head has an important seabird colony. A census in 1999 gave the following populations: Fulmar (55 pairs), Shag (8 pairs), Kittiwake (781+ pairs), Guillemots (286 individuals), Razorbills (191 individuals) and Black Guillemots (123 individuals). A few pairs of gulls also breed. Both the Kittiwake and Black Guillemot populations are of national importance. Peregrine Falcon, an Annex I species of the EU Birds Directive, breeds, as well as Raven and Kestrel. Characteristic bird species of the heath areas are Stonechat, Whitethroat, Linnet and Skylark. The heath and grassland habitats at this site are threatened by reclamation for agriculture and also by frequent burning. The site is a popular recreational area and is especially used by walkers. Bray Head is of high conservation importance as it has good examples of two habitats (sea cliffs and dry heath) listed on Annex I of the EU Habitats Directive. It also supports a number of rare plant species and has ornithological importance.

22.10.1999

Site Name: Knocksink Woods cSAC and pNHA
Site Code: 000725

Knocksink Wood is situated in the valley of the Glencullen River north-west of Enniskerry. The fast-flowing Glencullen River winds its way over granite boulders along the valley floor. The steep sides of the valley are mostly covered with calcareous drift. Some of the slopes are dominated by Sessile Oak (*Quercus petraea*) with a sparse shrub layer of Holly (*Ilex aquilinum*) and Hazel (*Corylus avellana*), while on the ground there is a carpet of Great Wood-rush (*Luzula sylvatica*). Other areas are characterised by mixed woodland, with Oak, Ash (*Fraxinus excelsior*), Beech (*Fagus sylvatica*), Sycamore (*Acer pseudoplatanus*) and the occasional conifer occurring. The ground flora includes Ivy (*Hedera helix*) and Brambles (*Rubus fruticosus* agg.), and often luxuriant ferns, such as Hart's Tongue (*Phyllitis scolopendrium*), Soft Shield-fern (*Polystichum setiferum*), and mosses. Lichens occur abundantly on some trees. A notable feature of the slopes is the frequent and extensive springs and seepage areas within the woodland. These petrifying springs are listed as a priority habitat on Annex I of the EU Habitats Directive. Associated with the springs and the river are stands of wet alluvial forest, also a habitat listed with priority status on Annex I of the EU Habitats Directive. The wet woodland is dominated by Ash and Alder (*Alnus* spp.) and is assigned to the group *Carici remotae-Fraxinetum*. Other species which occur include Willow (*Salix* spp.), Birch (*Betula pubescens*) and Hazel. Islands in the river and open gravelly areas provide further habitat diversity. A number of scarce or rare plants occur within the site including Blue Fleabane (*Erigeron acer*), Ivy-leaved Bellflower (*Wahlenbergia hederacea*) and Yellow Archangel (*Lamiastrum galeobdolon*). This site has one of the most diverse woodland invertebrate faunas in Ireland, incorporating wet woodland organisms threatened

internationally within the EU. Vertebrates noted in the vicinity, either by tracks, sett or sight, include Red Squirrel, Badger, Rabbit and Deer. The woodland supports large populations of birds, including many common passerines (Robin, Blackbird, Song Thrush, Wren, Chaffinch) and crows, such as Rook, Hooded Crow, Magpie, Jackdaw and Raven. A Buzzard has been noted in the area and Dipper are occasionally seen in the river.

The importance of this site lies in the diversity of woodland habitats which occur. The presence of rare or threatened plants and invertebrates adds to the interest. Much of this site has been designated a Statutory Nature Reserve and there is presently an educational centre within the site.

07.08.2003

Proposed Natural Heritage Areas⁸⁴

Site Name: Great Sugar Loaf pNHA
Site Code: 001769

The Great Sugar Loaf is situated about 5 km southwest of Bray. It is a steep mountain, 501 m above sea level, and has been modified greatly by glacial erosion. It stood as a nunatak which was scoured by the Ivernian, Midland and Mountain ice sheets. Its profile thus contrasts with those of a Bray Head and Howth, both over-ridden by ice sheets and flat on top. The main habitats of the site are dry mountain heath and upland grassland. The lower slopes are dominated by Gorse *Ulex europaeus* and *U. gallii*, but Heather (*Calluna vulgaris*), Bilberry (*Vaccinium myrtillus*) and Cross-leaved Heath (*Erica tetralix*) also occur and become more frequent on the upper slopes. Bracken (*Pteridium aquilinum*) is found in dense patches amongst the Gorse. The heath grades into upland grassland in places; grass species include *Nardus stricta*, *Festuca ovina* and *Agrostis capillaris*. The wetter grassland areas have rushes (*Juncus* spp.), sedges (*Carex* spp.) and mosses (*Sphagnum* spp.). Exposed rocky outcrops or areas of scree occur on the mountain sides, especially on the eastern slopes. The lichen and moss communities are well developed in these places, with species of *Cladonia* spp., *Dicranum* spp. and *Polytrichum* spp. An area of woodland, known as the Quill, occurs on the lower eastern slope. This is secondary woodland dominated by Oak *Quercus petraea*, Birch (*Betula pubescens*) and Holly (*Ilex aquifolium*). Part of the woodland is wet, with Birch as the dominant species and a ground flora more characteristic of wet heath. The wet seepage areas within the wood have Purple Moor Grass (*Molinia caerulea*), Bog Asphodel (*Narthecium ossifragum*), Pondweeds (*Potamogeton* spp.) and mosses *Sphagnum* spp.). A rare liverwort, *Cryptothallus mirabilis*, has been recorded beneath the *Sphagnum* layer. The stream running from the woodland provides a hydrological link with another Natural Heritage Area, Kilmacanogue Marsh. The site is of both ecological and geological interest, and is also a prominent feature in the landscape of north County Wicklow. Because of its ease of access and close proximity to large urban areas, the Great Sugar Loaf is a valuable educational and recreational asset.

15.02.1995

Site Name: Kilmacanogue Marsh pNHA
Site Code: 000724

This site is located off the main Dublin to Wexford road, just south of Kilmacanogue and at the base of the Great Sugarloaf. A small stream links the site to the Great Sugarloaf NHA. The site is a well-developed mosaic of wet woodland surrounded by poor fen and wet grassland. A

⁸⁴ National Parks and Wildlife (various) *Site Synopses for Proposed Natural Heritage Areas* Dublin: Government of Ireland

stream flows through the site in a northerly direction. The whole area is very wet due to the presence of numerous springs and seepage areas, arising from run-off from the Sugarloaf on the western side of the site and Kilmurry on the eastern side. The wet woodland is mainly of dense Alder (*Alnus glutinosa*) and Willow (*Salix atrocinerea*). Plant species of the open areas of wet grassland and poor fen includes Purple Loosestrife (*Lythrum salicaria*), Meadow Sweet (*Filipendula ulmaria*), Common Spotted-Orchid (*Dactylorhiza fuchsii*), Reed Canary-grass (*Phalaris arundinacea*), rushes (*Juncus effusus*, *J. acutiflorus*) and Great Horsetail (*Equisetum telmateia*). Many small sedges occur within the site including *Carex paniculata*, *C. panicea*, *C. nigra*, *C. hirta* and *C. remota*. Plants recorded in the wetter areas include Bogbean (*Menyanthes trifoliata*), Ragged Robin (*Lychnis flos-cuculi*), Marsh Marigold (*Caltha palustris*), Water Mint (*Mentha aquatica*). The site is of international importance on account of the fen/fen carr invertebrate communities, which includes two species of fly endangered within the European Union - (*Oxycera falleni* and *Oxycera morrisii*, Order Diptera). Another scarce fly species, *Parhelophilus consimilis*, Order Diptera, has been recorded. The site is vulnerable to drainage and fen carr clearance from farming activities and to pollution of the stream by up-stream adjacent dwellings. The proposed widening of the Dublin-Wexford road could alter the hydrology of the system. This site is important in having a diversity of species-rich wetland habitats within a relatively small area, and particularly for the presence of some rare invertebrates.

16.02.1995

Site Name: Powerscourt Woodland pNHA

Site Code: 001768

Powerscourt Woodland is located about 2 km south-west of Enniskerry. It is largely contained within the two large demesnes of Powerscourt and Charleville, and includes a 4 km stretch of the Dargle River. The topography of the area is rolling hillside sloping down to the river. The site includes some parkland with large specimen trees. Mixed woodland covers most of the site and includes both native and introduced species. Beech (*Fagus sylvatica*), Sycamore (*Acer pseudoplatanus*), Horse Chestnut (*Aesculus hippocastanum*) and many exotic conifers are among the introductions. The native Oak (*Quercus petraea*) and Ash (*Fraxinus excelsior*) are locally common. The shrub layers are variable, sometimes sparse where conifers predominate and otherwise with Holly (*Ilex aquifolium*), Elder (*Sambucus nigra*) and Honeysuckle (*Lonicera periclymenum*). Rhododendron (*Rhododendron ponticum*) and Laurel (*Prunus laurocerasus*) are locally abundant. Typical plants of the ground layer include Bluebells (*Hyacinthoides non-scripta*), Ramsons (*Allium ursinum*), Herb Robert (*Geranium robertianum*), Wood Sanicle (*Sanicula europaea*), Enchanter's-nightshade (*Circaea lutetiana*), Germander Speedwell (*Veronica chamaedrys*), Wood Sorrel (*Oxalis acetosella*) and Dog Violet (*Viola riviniana*). The fern and moss floras are well developed in places; Powerscourt is also the site of a rare species of Myxomycete fungus, *Didymium clavus*. The Dargle River holds a rich flora on its sandy and rocky banks. Species include Red Campion (*Silene dioica*), Tufted Wheatgrass (*Agropyron caninum*), Wood Fescue (*Festuca gigantea*), Wood Brome (*Bromus ramosus*), Goldilocks (*Ranunculus auricomis*) and Wood Rush (*Luzula pilosa*). Exposed areas in the centre of the river hold Coltsfoot (*Tussilago farfara*), Water Mint (*Mentha aquatica*), Welsh Poppy (*Meconopsis cambrica*), Remote Sedge (*Carex remota*) and Purple Loosestrife (*Lythrum salicaria*). There is some wet woodland associated with low-lying areas of the Dargle - Alder (*Alnus glutinosa*) is the predominant tree species. There are many tributaries to the Dargle at the southern end of the site. They flow through small steep-

sided ravines, which are often covered in a Hazel (*Corylus avellana*) dominated scrub/woodland. Although the site includes many exotic plant species, the habitats are still of interest and support an interesting flora. The mix of semi-natural habitats and estate woodland is particularly conducive to macro-fungi. The well documented record of land management practices held by the demesnes adds to the scientific interest. The area is also of great educational value, being frequently used for teaching.

31.03.1998

Site Name: Dargle Valley pNHA

Site Code: 001754

This site is located about 2 km south-east of Enniskerry. It is a section of the River Dargle with steep wooded banks. At one point along the river a well exposed series of Ordovician volcanic rocks are faulted against well-exposed Bray group Cambrian strata. Such a clear exposed junction is not seen elsewhere in Co. Wicklow. The area is dominated by mature Oak (*Quercus petraea*) woodland, with some Hazel (*Corylus avellana*), Beech (*Fagus sylvatica*), Birch (*Betula* spp.) and Holly (*Ilex aquifolium*). Pockets of mature conifers occur in places, as well as Laurel (*Prunus laurocerasus*). The ground flora is rather sparse and mainly of Wood Rush (*Luzula sylvatica*) and Blackberry (*Rubus fruticosus* agg.). The steep gorges over the river hold a luxuriant growth of mosses, while species common along the river bank include Red Campion (*Silene dioica*), Yellow Pimpernel (*Lysimachia nemorum*), Marsh Hawk's-beard (*Crepis paludosa*), New Zealand Willowherb (*Epilobium brunnescens*) and Giant Fescue (*Festuca gigantea*). A Red Data Book species, Yellow Archangel (*Lamiastrum galeobdolon*), occurs along the river. This is a very localised species confined to eastern Ireland.

The importance of this site is that it is a fine example of a wooded valley. It is likely that this valley has been wooded for a long period and such habitats are becoming rare in north County Wicklow. The removal of the conifers would increase the interest of the site. The site is also of considerable geological importance.

15.02.1995